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Pharmaceutical Strategy Training Course; Designing, Conducting and Evaluating

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5-7 February 2020

Poster 1

Abstract Presenter:

Navid Ravan

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Mehrdad Mostafavipour

Introduction:

Pharmacy students as future members, managers and leaders of pharmaceutical system must acquire different necessary skills and knowledge like systems-thinking, critical thinking, problem solving, decision making, strategic management, leadership, and interdisciplinary approach .

It seems that current Pharm-D curriculum is not sufficient and also cannot meet current-needs. therefore, designing extra-curricular courses can be productive and necessary.

Method:

Considering the illustrated objectives of the course, firstly courses with the most similarities in form and content like PharmD/MBA in Iran and developed countries were examined. Afterward, the course was designed based on Harden's 10-steps course-planning.

The course was hold in the form of 40-hours workshops,20-hours additional-activities.23Participants attended in this course .

The Education process had been problem-based and the participants must seek solutions to the challenges of Pharmaceutical and health systems through active-learning method. To improve learning quality working in small groups, gamification and role-play were used.

Results:

Based on Kirkpatrick's Level1 (Reaction), students were satisfied with the content, educational environment and the procedure. At level2 (learning), participants answered 12multiple-choice questions evaluation form. the participants' performance was statistically better than control-group. At level3(behavior), after 5months, a semi-structured interview with participants was arranged and the data was analyzed by Qualitative method with inductive-approach. Participants' behavior had developed significantly.

Since the level4 (Results) must be evaluated in long-term, a committee had been formed at Pharmaceutical-Strategic-Studies-Center (PSSC).

Discussion:

It seems that these courses offer capabilities that help the participants with their future professional status and career opportunity in the pharmacy-field.

It is recommended that pharmaceutical-strategic-training-course be verified with regard to the policies and principles suggested by Ministry of Health as "optional short-term courses" course in Faculties of Pharmacy all around the country.

Keywords:

Pharmaceutical strategy, course-planning, leadership, interdisciplinary approach

References:

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Comparison of oral absorption models for rivaroxaban in Iranian population

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5-7 February 2020

Poster 2

Abstract Presenter:

Tayebeh Esmaeili

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Saeed Rezaee

Introduction:

Rivaroxaban is a novel oral anticoagulant (NOAC) used for the treatment of deep vein thrombosis and prevention of Clotting in non-valvular arterial fibrillation (1). The aim of this study was to develop a population pharmacokinetic (PK) model to describe the absorption characteristics of rivaroxaban.

Methods:

Sixty-nine patients received different regimes of rivaroxaban (10, 15,20 mg once or twice a day) based on guidelines that were included in this study. Two plasma samples were collected from each patient for PK analysis in a steady state (before the dose and one to three hours after the dose). Because the concentrations-time correlation was not properly modeled by a conventional first-order absorption model, zero-order absorption and transit compartment models were tested on a one-compartment linear PK model using a nonlinear mixed-effects method by Monolix; version 2019R2 software.

Result and conclusion:

The zero-order absorption model regard to dose-bio availability relationship best described the absorption characteristics of rivaroxaban in Iranian patients. We conclude that the absorption model should be Consciously chosen based on the principle of model selection criteria and not by using a conventional first-order absorption model for its popularity and simplicity.

Keywords:

Rivaroxabn, monolix, absorption models

References:

- MUECK, Wolfgang, et al. Clinical pharmacokinetic and pharmacodynamic profile of rivaroxaban. *Clinical pharmacokinetics*, 2014, 53.1: 1-16?.
- STAMPFUSS, Jan, et al. The effect of food on the absorption and pharmacokinetics of rivaroxaban. *International journal of clinical pharmacology and therapeutics*, 2013, 51.7: 549-561?.
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Formula optimization of mebudipine nanoemulsion based on artificial neural networks

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5-7 February 2020

Poster 4

Abstract Presenter:

Samira Khani

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Samira Khani

ABSTRACT:

Artificial neural networks (ANNs) are parallel, distributed information processing structures which are utilized to model complex relationships between inputs and outputs or to find patterns in data. Where a standard statistical analysis fails to work for recognizing more complex, multi-dimensional, and nonlinear patterns, ANNs are attractive alternatives. ANNs are capable of self-learning directly from existing relationships between data and applying the learned rules to unknown data for classification, prediction and other analyses, etc. Recently ANNs have been used in different fields of pharmaceutical research and many drug delivery systems. In this study, a nanoemulsion containing mebudipine [composed of ethyl oleate (oil phase), Tween 80 (T80), Span 80 (S80) (surfactants), polyethylene glycol 400, ethanol (cosurfactants), and deionized water] was prepared with the aim of improving its bioavailability for an effective antihypertensive therapy. Particle size of the formulation was measured by dynamic light scattering. Then, artificial neural networks were used in identifying factors that influence the particle size of the nanoemulsion. Three variables, namely, amount of surfactant system (T80 + S80), amount of polyethylene glycol, and amount of ethanol as cosurfactants, were considered as input values and the particle size was used as output. The developed model showed that all the three inputs had some degrees of effect on particles size: increasing the value of each input decreased the size. Furthermore, amount of surfactant was found to be the dominant factor in controlling the final particle size of nanoemulsion.

Keywords:

Artificial neural networks, Mebudipine, Nanoemulsion, Particle size

References:

Amani, A., York, P., Chrystyn, H., Clark, B. J., & Do, D. Q. (2008).

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nanosuspension through nanoprecipitation: An artificial neural networks study. *Journal of Pharmaceutical Innovation*, 9(2), 115–120

Phytosolve formulation and pharmacokinetic improvement of a new calcium channel blocker

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5-7 February 2020

Poster 5

Abstract Presenter:

Samira Khani

*** Correspondance:**

Samira Khani

ABSTRACT:

Phytosolve is a novel solubilizing technique. In this technique phospholipids, dispersed in highly concentrated aqueous solution of polyol or carbohydrate, are able to solubilize large quantities of lipids, steroids, terpenes and polar lipids. The objective of the present study was to evaluate the pharmacokinetic parameters of dibudipine Phytosolve after oral administration in rats. The solubility test was carried out to select a suitable oily solvent for dibudipine. Phytosolve formulation was prepared with medium-chain triglyceride (MCT) oil (20%), soybean phospholipids (5%) and a 70% fructose solution (75%). The effect of polyol content on the mean globule size of Phytosolve formulation was studied. The optimized formulation was evaluated for robustness toward dilution, transparency, droplet size, zeta potential, and transmission electron microscopic analysis. The Phytosolve of dibudipine with an average droplet size of 142.3 ± 4.3 nm and surface charge -18.36 ± 0.37 mv was administered orally to rats. The average relative bioavailabilities of dibudipine in the plasma with Phytosolve were 170.4% and 211.2% as compared to the oily solution and aqueous suspension respectively. So this formulation could be offered as a useful technique to improve the oral delivery of poorly water-soluble drugs such as dibudipine.

Keywords:

Dibudipine, Phytosolve, Bioavailability, Solubility, Lipid-based formulation

References:

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Preparation and characterization of chitosan / cadmium polymer core-shell quantum nanoparticles and evaluation of anti-leishmaniasis effects

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5-7 February 2020

Poster 6

Abstract Presenter:
Sina Bahraminejad
*** Correspondance:**
Mehdi Ranjbar

Introduction:

Leishmaniasis is a parasitic disease caused by different species of a Leishmania flagellum protozoan. Problems such as high cost, toxicity, high treatment duration, painful injections, increased drug resistance, drug side effects, recurrence, secondary bacterial infections, and reports of several epidemics especially in people with systemic deficits. There is safety, so research is underway to introduce new drugs, including chemicals, herbs and even nanoparticles.

Method and Results:

In this study, nanostructured chitosan / cadmium polymer core-shell quantum dots were fabricated by microwave co-deposition. After determining the best effective concentrations of nanoparticles by flow cytometry, different concentrations of the desired nanoparticles were selected as effective concentrations.

Conclusion:

Leishmania major parasites were incubated with the drug for 4 h and apoptosis was assessed by flow cytometry and then a concentration of drug that inhibited 50% growth of the parasites by counting intracellular parasites (amastigotes) and averaging. The expression of IL10, IL12, IL1 β and iNOS genes were evaluated by Real-Time PCR. Also, to evaluate the toxicity in murine macrophages, CC50 different concentrations of nanoparticles and control drug (amphotericin B) were calculated by MTT method.

Keywords:

Nanoparticles, core-shell quantum dot, anti-leishmanial effect

References:

- Karimi, M., et al., The Killing effect of Silver Nanoparticles and Direct Electric Current Induction on Leishmania major Promastigotes in Vitro. Pathobiology Research, 2015. 18(3): p. 87-96.
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Prediction of the Oral Bioavailability Correlation Between Human and Rat

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5-7 February 2020

Poster 7

Abstract Presenter:
Samineh Beheshti Rouy

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Samineh Beheshti Rouy

ABSTRACT:

Study of preclinical species (mostly rats) are prior to human clinical studies. They have a potential role in pharmacokinetic studies, in drug discoveries and development. According to literature, the rat bioavailability is not always predictive of bioavailability in human. This prediction faces many challenges due to physiological and metabolic differences which are completely species-dependent. Rostami Hodjegan and coworker reported a lack of correlation in the studied data set and animal bioavailability is not quantitatively predictive of bioavailability in human.

So it is really important to be aware if we can rely on data which are gained from preclinical studies (which are mostly done on rats). Since the oral bioavailability is a pivotal factor evaluated in drug discovery and development, in this study we used structural parameters to predict the oral bioavailability correlation between human and rat.

The oral bioavailability data of drugs were collected from the literature by Rostami Hodjegan and coworkers. Afterwards, the structural descriptors of drugs (logP, logD6.8, Molecular weight (Mw) and Abraham solvation parameters) were calculated by ACD/iLab software. The optimal threshold to define the boundary between two classes was set at logD6.8=2. Then, binary logistic regression of bioavailability data set by SPSS Version 23 software was used for predicting the class of each drug (class I or II) to indicate if there is yes or no correlation between the bioavailability of drug in human and rat. The model is developed for drugs with logD6.82 which is assumed to have low lipophilicity in human and rat.

$$P = e^{(1.411B+0.368A+0.393S+1.006Mw)} / (1 + e^{(1.411B+0.368A+0.393S+1.006Mw)})$$

In this model P is probability of binary responses. In addition, probability (p-value) associated with each descriptor was less than 0.2. The prediction accuracy of the developed method is 66% and 91% for class I and II, respectively. overall, using Mw (molecular weight), A (hydrogen bond acidity), B(hydrogen bond basicity) and S(polarizability), the class of 79% of compounds were predicted correctly.

Keywords:

Bioavailability, prediction, rat, linear regression

References:

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Application and comparison of Purified free and Immobilized

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5-7 February 2020

Poster 8

Abstract Presenter:

Salar Sadeghian

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Mohammad Ali Faramarzi

Introduction:

Lignocellulosic biomass as the second most abundant and low cost bio-waste in terrestrial plants is a promising feedstock for alternative fuels, chemicals, or raw materials for pulp and paper. Despite the abundance, the use of lignocellulose has been particularly challenging due to its inherent structural recalcitrance. Among many biomass recalcitrance factors, lignin poses a crucial challenge in the biological conversion process of lignocellulosic biomasses. Thus, the first major step in lignocellulose utilization is pre-treatment aiming at increasing the accessibility of cellulose and hemicellulose without reducing their quality by degrading the lignin component. Laccases are arguably the most promising candidates in this area due to their environmentally friendly and non-toxic reaction with lignin, superior performance in degrading the lignin and producing soluble phenolic monomers.

In addition, the immobilization of enzymes can offer more efficiency and economic convenience over the enzymes in solutions, by improving their long-term operational stability, shelf-life storage, and resistance to extreme conditions and by allowing easy recovery and multiple reuses of the linked enzymes, continuous operation, and rapid termination of the process

Methods:

Affinity purified laccase (from *L. tigrinus*) was immobilized covalently on the large pore magnetic SBA-15. Free and immobilized enzyme's characterizations (such as reaction conditions and stability) was studied and compared against each other. Free and immobilized laccase were used for delignification of lignocellulosic bio-waste through determination of kappa number (also phenol removal and scarification were measured). And the procedure was optimized related to multiple factors. The changes in pulp composition and structure were determined by van Soest procedure, GC-MASS and SEM.

Results:

Compared to free enzyme, immobilized enzyme maintained more stable at various pH and temperatures, as well as against organic solvents, surfactants, metal ions, and inhibitors. 80% of lignin content of the bio-waste was removed by 50 U mL⁻¹ of immobilized enzyme after 8 h fermentation and delignification efficiency was greatly increased by applying higher enzyme dosages, surfactants, and organic solvents. In addition, residual activity was more than 50% after 20 cycles of delignification. The results of delignification were confirmed by GC-MS, SEM, and composition analysis of pistachio shells.

Keywords:

Enzyme immobilization, Laccase, Delignification, Fungal enzymes, *Lentinus. Tigrinus*

References:

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MUC1 and MUC1 Aptamer: Potential Opportunity for Cancer Treatment

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5-7 February 2020

Poster 9

Abstract Presenter:

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ABSTRACT:

MUC1 protein exists on the apical surface of most normal cells, secretory epithelial cells and, on hematopoietic cells to a lesser degree. However, it is aberrantly overexpressed in many cancers. difference expression of normal MUC1 and tumor-related MUC1 makes this protein an attractive tumor-associated marker for diagnostic or cancer treatment. Aptamers are the molecules most similar to antibodies, as they can bind a target with a lock and key model. Aptamers may be even more effective than antibodies due to their better stability, ease of modification, less immunogenicity and variable pharmacokinetic profiles diagnostic, drug delivery. The MUC1 aptamer in targeted drug delivery

Several aptamers with high affinity have been isolated against MUC1. In this article we focus on anti- MUC1 aptamers and their application in targeted therapy of cancer. MUC1 aptamer used for cancer drug targeted delivery in to way, aptamers directly was attached to anti-cancer drug or conjugated to nanoparticle surface. Nanoparticle that MUC1 attached to their surface for targeted drug delivery were: 1- poly (lactic-co-glycolic-acid) (PLGA), 2- DNA nanoparticle like DNA icosahedron, DNA dendrimer and DNA tetrahedron 3- Quantum dots were used for targeted delivery of Doxorubicin 4- Aptamer targeted superparamagnetic iron oxide nanoparticles (SPIONs) for both tumor treatment and imaging. 5- MUC1 aptamer-decorated chitosan and hyaluronan/chitosan nanoparticles. MUC1 aptamer also involved in siRNA delivery, photo-thermal therapy, photodynamic therapy and targeted radiotherapy of cancer.

Chemotherapy is the main method of cancer therapy. The goal of targeted therapy is to overcome at least some of nonspecific side effects chemotherapy. Several MUC1 aptamers have been isolated, including S1.1, S2.2, 5TR1, 5TRG2, MA3, and GalNAc3. To the best of our knowledge, this review is the first paper that consider the use of MUC1 aptamers. Among these aptamers 5TR1 aptamer has been used more frequently than the others, suggesting that 5TR1 perhaps has a better chance of transient in vivo trial studies and reaching a preclinical trial phase

Keywords:

Cancer, MUC1, Targeted therapy, Aptamer, Drug delivery

References:

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Hu Y, Duan J, Zhan Q, Wang F, Lu X, Yang XD. Novel muc1 aptamer selectively delivers cytotoxic agent to cancer cells in vitro. *PLoS One* 2012;7(2):e31970.

Evaluation of cytotoxicity of some synthetic coumarin derivatives on MCF-7 cell line

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5-7 February 2020

Poster 10

Abstract Presenter:

Mehdi Abaszadeh

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Azade Ebrahimi

Introduction:

Cancer is caused by the uncontrollable division of cells due to genetic and environmental disorders. In the case of genetic mutations, normal cells get out of their normal growth and lead to the creation of tumor cells. Coumarins are an important group of compounds that have a particular role in nature. Their efficacy has been identified in a number of cases, and due to their potentially useful effects on human health, they have received special attention. Coumarins have been considered as promising compounds with numerous effects such as anti-proliferative, apoptosis inducer and angiogenesis inhibitor in treatment of cancer. therefore, in this investigation, the cytotoxic effect of 3-hydroxy coumarin derivatives were evaluated.

Methods:

MCF-7 cell line was incubated in DMEM growth medium at 37 °C and 5% of CO₂. After proliferation, 1×10⁴ cells were placed in 96-well culture plates. After 24 hours of incubation, the synthesized compounds dissolved in minimum amount of DMSO and diluted with growth medium were added with different concentrations to the cells. After 24 hours of incubation, the cytotoxicity of the compounds was evaluated by MTT assay and IC₅₀ values were calculated.

Results:

3-hydroxy coumarin derivatives inhibited the growth of MCF-7 cells in a concentration-dependent manner. Minimum calculated IC₅₀ was 15.25 ± 1.05 µg/ml. the calculated IC₅₀ of doxorubicin on this cell line was 8 µg/ml

Conclusion:

The results show that 3-hydroxy coumarin derivatives have the potential anticancer effects and more researches in this subject are valuable.

Keywords:

Coumarin derivatives, MCF-7 cell line, Cytotoxicity

References:

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Optimized synthesis of magnetic nanoparticles to facile drug delivery strategy

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5-7 February 2020

Poster 11

Abstract Presenter:

Amirali Taherian

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Neda Esfandiari

Introduction:

It has been not long that nanotechnology has come to aid medicine. The new field of science which uses nanotechnology to overcome the drawbacks of therapeutic methods is nowadays known as nanomedicine. Nanomedicine utilizes particles within the range of 1 to 100 nm. Interestingly, nanoparticles could be coated with other materials to better biocompatibility. Furthermore, by altering the structure of nanoparticles, nanocapsules and nanocomposites could be developed. The synthesized nanoparticles could be vastly used in drug delivery strategies. By having specific drug delivery property, they could significantly decrease the cytotoxicity of the drugs to nonspecific tissues. Although many materials have been used to form nanoparticles, magnetic nanoparticles have gained more attention. As a theranostic particle, it could be used both in diagnosis and therapeutics. In this inquiry, the facile synthesis of magnetic nanoparticles was studied. Materials and

Methods:

Magnetic nanoparticles (FeCl_2 , FeCl_3) were synthesized with the hydrothermal method. To obtain pure particles, magnetic nanoparticles were washed off by magnetic decantation. In order to confirm the size of magnetic nanoparticles, DLS was carried out.

Results:

The dynamic light scattering (DLS) technique can observe the size distribution and concentration of nanoscale particles. Thus, the mean particle size has been recorded approximately 30.2 nm by dynamic light scattering method. Conclusion: It has been observed that the mean size was in the range that it could be pass cell membrane which approves its cell internalization potential. Moreover, by reaching the desired size, nanoparticles could pass through the blood-brain barrier and could be possibly applicable in brain disease therapy. By such characteristics, the synthesized nanoparticle could be loaded with the desired drug and used for further drug delivery studies.

Keywords:

Magnetic nanoparticles, Cancer Therapy, Drug delivery

References:

Magnetic nanoparticle-promoted droplet vaporization for in vivo stimuli-responsive cancer theranostics
 Synthesis and modification of uniform PEG-neridronate-modified magnetic nanoparticles determines prolonged blood circulation and biodistribution in a mouse preclinical model
 Multifunctional Nanoparticles for Drug Delivery and Molecular Imaging

The effect of chitosan in enhancing magnetic nanoparticles drug delivery

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5-7 February 2020

Poster 12

Abstract Presenter:
Amirali Taherian

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Neda Esfandiari

ABSTRACT:

Nanotechnology is an interdisciplinary field of science that offers particles within the size range of 1 to 100nm. By entering to the nanoscale, particles achieve properties which could not be expected in their bulk form. Furthermore, the promising technology could be used in therapeutic methods such as drug delivery. By using nanotechnology in the medical field, also known as nanomedicine, various number of limitations could be vanquished. Nanoparticles achieve properties such as promoting stability and solubility of the drug. Moreover, they could reduce drug toxicity to undesired tissues by their specific targeting system. Among materials used to form nanoparticles, magnetic materials and chitosan have gained more attention. Magnetic nanoparticles have not only been vastly used in the therapeutic system, but have also been widely used in diagnosis methods. Particles having such properties are called theranostic. Furthermore, chitosan as a linear amino polysaccharide has gained significant attention. It has been approved that chitosan has strong biocompatibility and biodegradability. Therefore, it could be used as an effective drug carrier. This research intends to study magnetic nanoparticles and chitosan effects in drug delivery. Materials and methods: Magnetic nanoparticles were derived from $FeCl_3$ and $FeCl_2$ by hydrothermal method. Then monomeric chitosan was coated on synthesized NPs and then polymerized. Also, characterization methods such as zeta potential and FT-IR have been carried out. Results: -48.3mV was recorded for blank magnetic nanoparticles and after coating, it was changed to 44.6 mV which proves the coating of chitosan. Also, FT-IR peaks at 3430.28, 1613.74 and 576.58 cm^{-1} confirmed the character of magnetic nanoparticles. Furthermore, by adding chitosan, peak alternation illustrated the validity of the coating. Conclusion: The achieved results have shown that the synthesized nanoparticles are stable and compatible with drug delivery.

Keywords:

Magnetic nanoparticles, Chitosan, Drug delivery, Theranostic

References:

- Development of citrate-stabilized Fe_3O_4 nanoparticles: Conjugation and release of doxorubicin for therapeutic applications
- Fabrication of chitosan-magnetite nanocomposite strip for chromium removal
- Synthesis and characterization of chitosan coated magnetite nanoparticles and their application in curcumin drug delivery

In Silico Identification of Common Putative Drug against pathogenic

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Poster 13

Abstract Presenter:

Vajiheh Eskandari

* **Correspondance:**

Vajiheh Eskandari

Introduction:

Enteric Escherichia coli (E. coli) are both natural flora of humans and the major causes of infections in developing countries. The fimbriae on the surface of E.coli are virulence factors that chaperones and usher proteins involved in the biogenesis of the fimbriae (1).

Methods and results:

To investigate the roll of animal pathogenic E.coli in human disease, the Phylogenetic trees were constructed based on the multiple alignments of fimbrial chaperones using TreeTop server. Based on the CU phylogenetic analysis, some animal fimbrial chaperones are closely related to human characterised ETEC virulence factors.

The 3D-structures of chaperones were modeled using homology-modeling methods of the Modeller 9v20 (2). The quality of the models were assessed using PROCHECK, Verify3D and ProSA II. The active pocketes predicted using CastP, Ftsite and Coach (3) servers.

Zinc database was docked against the sensitive pocket of PapD chaperone and and top 10000 ligands was extracted. We found that the meta-oxybenzoylecgonine is a putative good ligand to interact with all chaperones using AutoDock Vina software.

Conclusion:

Our results may provide useful information for re-finding and/or re-designing new inhibitors to block the chaperone binding pocket which could be introduced as common drug candidates against some pathogenic E.coli.

Keywords:

Chaperones, Modeller, Docking

References:

Fegan N and Gobius KS. 2013. Pathogenic escherichia coli and one health implications. Curr Top Microbiol Immunol. 366, 49-62.

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3-D Structural comparison of thermophilic and psychrophilic chitinases

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5-7 February 2020

Poster 14

Abstract Presenter:

Vajiheh Eskandari

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Introduction:

Chitin is one of the most abundant naturally occurring polysaccharides and has received tremendous attention in the fields of agriculture, pharmacology, and biotechnology (1). The objective of this study was to investigate the 3-D structural properties and amino acid preferences of cold and hot- adapted chitinases .

Methods and Results:

The 3-D structure of 20 chitinases belong to two temperature type groups were obtained from PDB Data Bank and/or modeled using Modeller 9 & 20 software. The quality of the models were evaluated with PROCHECK and PROSA II (2) servers.

GETAREA and VADAR (3) servers applied for determine of 3-D structures properties, such as: % α -helix, β -sheet, the ratio of Number of surface atoms to Number of buried atoms, Mean residue volume and total volume of proteins .

The results strongly suggested a regular increment of molecular heavyness with increasing temperature, due to small non-polar amino acids such as glycine and alanine in psychrophiles which are replaced by the bulky ones such as Arginine, Lysine, Isoleucine, Lucien and Valine in thermophiles. The results indicated the ratio of Number of surface atoms to Number of buried atoms to be statistically significant in case of thermophiles versus their psychrophiles homologs. The InterPro analysis detected more than one chitin binding domain(s) in many psychrophilic enzymes. Indeed, understanding on how these enzymes achieve the ability to tolerate extreme temperatures will be useful in redesigning of the enzymes to improve their catalytic activity in appropriate temperature.

Conclusion:

Results of this study suggested occurrence of bulky and basic Arginine and Lysine residues thermophilic chitinases and further small and nonpolar amino acid such as: Glycine psychrophilic ones.

Keywords:

Chitinase, Modeller, Structural properties

References:

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Patents and clinical trials survey on CRISPR-based therapeutics

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5-7 February 2020

Poster 15

Abstract Presenter:

Zahra Pakrouh Jahromi

*** Correspondance:**

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Introduction:

Gene modification can be a promising cure for many genetically complicated or infectious diseases, cancers and other beyond. Nowadays different genetic manipulation methods and various nucleic acid-based therapeutics include plasmids containing transgenes, oligonucleotides, aptamers, ribozymes, DNazymes, and siRNAs are tested for the treatment of diseases and there are some medicines have been approved by the regulatory agencies so far. As early as 2012 it became apparent that a clustered regularly interspaced short palindromic repeats (CRISPR) by its RNA guide and CRISPR-associated protein(cas) can be a useful technology that allows easier manipulation of the genome. Here we have reviewed the patents and clinical trials conducted with CRISPR system for the treatment of diseases.

Method:

The topic and related keywords of CRISPR based treatment has been searched in the google scholar, pubmed, google patent, patentscope search engines and articles, patents and clinical trials till December 2019.

Results:

More than 10 clinical trials are ongoing worldwide involving CRISPR-Cas genome editing and these trials are all in the early stages. Clinical trials are underway in different areas such as cancers, blood disorders, and eye disease. Clinical trials to treat cancer have begun as early as 2015 in china while the first US and European clinical trials are both due to begin enrolling patients in 2018. US and china have published 872 and 858 patents applications repectively. Applications from China have climbed rapidly in recent years, and the country dominates in the agricultural and industrial applications, but equal in medical application. Chinese progress in CRISPR may be due to simplistic ethical law than west.

Conclusion:

Nine nucleic acid based products are approved for treatment while there is no CRISPR approved medicine released from clinical trials until now, but the number of CRISPR-based treatment patents for treating other conditions like Huntington disease, HBV, HIV, Duchenne muscular dystrophy, and brain disorders have been raised in 2019 and there is a bright future in using CRISPR-Cas system as treating diseases.

Keywords:

CRISPR, nucleic acid based therapeutics, genome engineering, clinical trials, patents

References:

Li B, Niu Y, Ji W, Dong Y. Strategies for the CRISPR-Based Therapeutics. Trends in Pharmacological Sciences. 2020;41(1):55-65.

Sun J, Wang J, Zheng D, Hu X. Advances in therapeutic application of CRISPR-Cas9. Briefings in functional genomics. 2019.

Yin H, Xue W, Anderson DG. CRISPR-Cas: a tool for cancer research and therapeutics. Nature reviews Clinical oncology. 2019;16(5):281-95.

Design, synthesis, and evaluation of celecoxib-conjugated double domain nanoparticles based on polyethyleneimine in order to transfer plasmid encoding IL-12 into inflammatory tissues

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5-7 February 2020

Poster 16

Abstract Presenter:

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ABSTRACT:

Gene therapy is an experimental technique that transfers genes to target cells or tissues to achieve a therapeutic effect or correct a malfunction. Successful gene therapy relies on a good gene transfection with minimal toxicity, sufficient selectivity, and efficient gene delivery through vectors. There are two types of vector systems in transfection: 1. viral systems 2. non-viral systems. Despite the high efficiency of viral systems, they are health-threatening and costly. Therefore, the non-viral system was used in this study. Polyethyleneimine is one of the non-viral vectors used in transfection, and many studies have shown its functionality and its advantageous properties.

In this research celecoxib-conjugated double domain nanoparticles were synthesized based on polyethyleneimine with different in conjugation, to investigate the buffering capacity, gene condensation, gene protection, size and zeta potential of particles. Celecoxib was used due to its targeting selectively of nanoparticles to cancer cells and tissues.

Evaluation of nanoparticles' properties has shown that modified polyethyleneimines have more condensed polyplexes, small size, and more zeta potential than unmodified polyethyleneimine. Additionally, like unmodified polyethyleneimine, they have DNA condensation ability, DNA protection effect, and buffering capacity in biologic pH.

Keywords:

polyethyleneimine, Gene therapy, Transfection, Celecoxib, polyplex

References:

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Exploring the potentials of miR-195 as biosensor for early stage detection of breast cancer

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5-7 February 2020

Poster 17

Abstract Presenter:

Fatemeh Moradbeygi

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Fatemeh Moradbeygi

Introduction:

Breast cancer is the second leading cause of cancer death among women after lung cancer with high financial burden for society and patients. As the incidence of breast cancer is increasing, early detection can increase quality of life and survival. Biosensor is an analytical device, used for the detection of a chemical substance that combines a biological component with a physicochemical detector. Nowadays, micro RNAs (miRNAs) have great potential to evolve into effective biomarkers in the clinic due to their extreme stability and ease of detection. Here we reviewed the potentials of miR-195 on early detection of breast cancer.

Method:

We searched PubMed and Google Scholar up to December 2019. Those studies which have been studied miR-195 and its tumor-suppressing capabilities were considered as the most important topics. Moreover, we extracted articles which were solely focused on microRNA-195 in breast cancer diagnosis.

Results:

Several studies have demonstrated that there is an association between microRNA-195 and breast cancer. MicroRNA-195 is an important member of the micro-15/16/195/424/497 family. The human miR-195 gene is activated in various diseases such as cancer, heart failure and schizophrenia. Mir-195 regulates the overexpression of target proteins involved in cell cycle, apoptosis and proliferation.

ACACA, HMGCR, RAF1, WNT3A, IRSI are target genes of miR-195 in BC. Overexpression of miR-195-5p inhibits cell proliferation, suppresses cell migration and accumulates cells in the G1 cell cycle. In the 3' UTR region of cyclin E1 (CCNE1), two target sites are found that may be miR-195-5p attached to them. In addition, miR-195 is also involved in lipid metabolism, which plays an important role in breast cancer.

Several studies have shown that circulated miR-195 has been specifically identified in BC, which distinguishes BC from other cancers and has 88% sensitivity and 91% specificity to the control group.

Conclusion:

Serum level of miR-195 is a promising tumor marker for the diagnosis of BC, especially in early stages. Such high sensitivity of miR-195 to neoadjuvant chemotherapy could be the basis for future studies on using of miRNA-bas.

Keywords:

Breast cancer, Mir-195, Tumor suppressor, microRNAs, Biosensor

References:

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Hairy Root Cultures of *Hypericum perforatum* L.; A Promising Method for The High Scale Production of Hypericin

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5-7 February 2020

Poster 18

Abstract Presenter:

Hanie Arjmandi

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Hanie Arjmandi

Introduction:

Hypericum perforatum L. (Hypericaceae) is one of the best-studied medicinal plants in the world. *H. perforatum* is native to Europe, West Asia and North Africa. These components contain secondary metabolites especially anthraquinones and anthraquinone glycosides such as hypericin and pseudohypericin have been biosynthesized by polyketide pathway in the plant. Hairy roots have a wide range capability the transformed hairy roots capable to produce the secondary metabolites in large amounts. The aim of this study was evaluation of production in large quantities of hypericin through hairy root lines of *H. perforatum*.

Materials and Methods:

This study was conducted to access hypericin in high amounts using hairy roots technology. Inoculation, Polymerase Chain Reaction (PCR) and hairy root production hairy root clones have been obtained using A4 strains of *R. rhizogenes* from sterile explants leaves, buds and stems by optimized method. A calibration curve was obtained using standard methanolic solutions of hypericin. Finally, retention time values (RT) for hypericin was observed at 15.38 min. In addition to, the hypericin amount in the hairy roots of *Hypericum perforatum* was measured. Comparison of four kinds of culture media in the same conditions showed that *R. rhizogenes* at ½MS medium had the highest efficiency (89.58%) for hairy roots induction, so was placed in (a) class. Comparisons of mean fresh and dry weight of clones at level of 99% have shown significant differences.

Results:

Electrophoresis data of PCR products have been showed T-DNA integration into the host genome of *H. perforatum* cells, certainly. The numerous morphological and physiological changes such as wizened and small leaves, decrease fertility, reduce apical dominance, shorter internodes; more picks of gland were created in them but as same as original plants are stable, genetically.

Conclusion:

We attempted to produce the hypericin in high scale using transformed hairy root cell lines. Finally, the methods have been used in the study suggest high potential of hairy roots to improve the quality and the quantity of pharmaceutical compounds.

Keywords:

Hypericum perforatum, *Rhizobium rhizogenes*, Hairy root, HPLC, Hypericin

References:

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Introducing in silico innovative strategy towards finding new indications and alternative chemotherapy regimens for treatment of thyroid carcinoma

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5-7 February 2020

Poster 19

Abstract Presenter:

Ghazaleh Ghavami

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Soroush Sardari

ABSTRACT:

Within the chemotherapy drugs most commonly used to treat thyroid cancer (TC), doxorubicin remains the most utilized drug in the relevant chemotherapy regimens. As the drug resistance often limits its efficiency in clinical approaches, the novel in silico strategy based on mixed computational and biological experimental approaches has been introduced in current research to identify alternatives for doxorubicin among other approved drugs.

First, doxorubicin was searched via DrugBank database to find its similar approved drugs both functionally and structurally. From the functional and structural viewpoints, 24 approved drugs with known pharmacological action as antagonists of DNA topoisomerase 2-alpha and 17 similar drugs ($1.0 \leq$ structural similarity score ≥ 0.791) with doxorubicin have been selected. Second, according to in vitro experimental approaches reported in GDSC database as a resource for therapeutic biomarker discovery in cancer cells, pointed 41 similar drugs were screened based on their toxicity effects against TC cell lines. Epirubicin with similar structure and function in addition to etoposide, mitoxantrone and teniposide with similar function to doxorubicin were showed toxicity on several TC cell lines in GDSC database. In the final stage of screening, epirubicin and etoposide with highest toxicity effects on TC cells among others have been selected and introduced as alternatives for doxorubicin to treat thyroid carcinoma. In order to in silico predicting and comparing the possible cellular responses of thyroid tumor cells at the level of proteins to accelerate the process of anticancer drug design/discovery, the four databases including I. thyroid carcinoma-related molecular targets and II-IV. relevant molecular targets with mechanisms of actions of doxorubicin, epirubicin and etoposide, have been constructed based on the reported data in valid scientific sources. Subsequently, the same molecular targets between database I with each databases II-IV have been selected to utilize as the input of STRING as a source of known and predicted protein-protein interactions for modeling and predicting the possible mechanisms of actions for doxorubicin, epirubicin and etoposide against thyroid carcinoma.

The current innovative strategy towards finding new indications and alternative chemotherapy regimens for existing drugs can be highly efficient, low-cost and risk-less compared with traditional drug design/discovery process. This research was funded by National Institute for Medical Research Development (NIMAD), Deputy of Research and Technology, Ministry of Health and Medical Education of Iran, in the frame of grant number 963566.

Keywords:

Thyroid carcinoma, in silico, drug discovery, drug design, epirubicin, etoposide

References:

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<https://www.drugbank.ca/>
<https://string-db.org/>

Expression of a polyepitopic colon carcinoma vaccine in *Escherichia coli*

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5-7 February 2020

Poster 20

Abstract Presenter:

Zahra Movahed

*** Correspondance:**

Zahra Movahed

ABSTRACT:

Tumor-specific mutations act as neoepitope. They do not express in healthy tissues and are ideal targets for cancer immunotherapies. Clinical studies have demonstrated that neoantigen vaccines has the ability to generate T cells that specifically target heterogeneous tumor clones. In our previous study, a hexatope containing neoepitopes of CT26 cells (colon carcinoma cell line) was designed. For this purpose, the neoepitopes were selected according to their frequency of expression and their ability to bind to MHC-I, MHC-II and TCR as well as to induce IFN- γ production. The selected epitopes of this hexatope were linked to each other by glycerin/serine linker. In order to examine the immunogenicity of this vaccine in vivo, it is necessary to prepare the designed CT26 polyneoepitopes. In this study, the synthesis of a recombinant plasmid containing the designed CT26 polyneoepitopes was ordered. The NcoI and XhoI restriction enzyme sites were inserted in two ends of the designed construct. To identify the protein expression by Western blotting and to purify the expressed protein easily, a 6-His tag was inserted at the end of the construct. Then, the CT26 polyneoepitope gene was cloned in NcoI/XhoI sites of pET-22 expression vector and transformed in BL21 (DE3). The expression of CT26 polyneoepitope was investigated by SDS-PAGE. The SDS-PAGE analysis showed that ~18 KDa CT26 polyneoepitope was successfully expressed in *Escherichia coli*.

Keywords:

Expression, E. Coli, Colon Carcinoma, Polytopic Vaccine, Neoepitope

References:

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Outer membrane vesicles (OMVs) isolation from *Escherichia coli* during various stages of bacterial growth

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5-7 February 2020

Poster 21

Abstract Presenter:

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ABSTRACT:

Outer membrane vesicles (OMVs), small spherical nanoparticles with a diameter of 20-400 nm, are commonly released by gram-negative bacteria and are composed of constituents of outer membrane (lipopolysaccharide, phospholipids and proteins) and periplasm. As OMVs can carry a vast array of cargoes, they can play different roles in bacterial survival (e.g. in nutrient acquisition, biofilm development, and pathogenesis). The highly immunologic properties of OMVs, enabled them to be applied as effective vaccines. OMVs can also be used as carriers for antigen delivery in different vaccines and for targeted delivery of therapeutic moieties in cancers, due to their natural stability and ability to protect the therapeutic payload. In this study, we aimed to determine the effect of bacterial growth stage on protein quantity of the extracted OMVs. Herein, OMVs were isolated from a new *Escherichia coli* strain with a genetically modified lipopolysaccharide molecule, ClearColi™. Accordingly, ClearColi™ were grown for 2, 4, 6 and 24 h representing pre-logarithmic, mid-logarithmic, pre-stationary and stationary growth phase, respectively. The bacteria were removed from cultures by centrifugation and the supernatant was filtered. OMVs were isolated from these supernatants by ultracentrifugation. Then, protein content of the extracted OMVs at each growth stage were examined. The results of SDS-PAGE analysis as well as bicinchoninic acid (BCA) protein assay showed that the protein content of OMVs was higher when they isolated from stationary phase as compared to other phases. Totally, our results suggest that the harvesting time for isolation of OMVs affects the OMVs yield. Our findings confirm the importance of considering the bacterial growth stage for OMVs isolation.

Keywords:

OMV

References:

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Microbial production of testolactone by *Aspergillus brasiliensis*

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5-7 February 2020

Poster 22

Abstract Presenter:

Arezo Khoshhal

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Tahereh Hosseinabadi

Introduction:

Given the widespread use of steroids in the pharmaceutical industry, researchers are trying to find new, better-acting steroids with cost-effective methods. Due to the complex spatial structure of these compounds, the use of biocatalytic methods as environmentally and economically competitive tools for their synthesis has been considered. In the present study, the ability of *Aspergillus brasiliensis* to transform testosterone to testolactone was investigated.

Methods and Results:

The fungus was cultured after activation to investigate the growth process. Fresh fungal spores were inoculated into the transformation medium and testosterone added as substrate at the appropriate time for biotransformation and fermentation continued. The result of metabolism was investigated and the metabolites extracted by liquid-liquid extraction and isolated by thin-layer chromatography. Different spectroscopic techniques including Mass, IR, ¹H-NMR and ¹³C-NMR were used to identify structure of the metabolite as well as the melting point measurements. Structure determination was performed based on comparing of the spectral data of the starting compound with those of the metabolite. Analysis of the bioconversion process revealed that testosterone was converted to testolactone indicating the presence of Baeyer-Villiger monooxygenase (BVMO) activity in the fungal strain.

Conclusions:

The results of this study indicate that *Aspergillus brasiliensis* can be considered as a significant biocatalytic tool for the conversion of testosterone to testolactone. Optimization of this conversion can be considered from the industrial point of view.

Keywords:

Biotransformation, *Aspergillus brasiliensis*, Testosterone, Testolactone

Design and construction of a Bispecific aptamer-siRNA chimera for triple negative breast cancer treatment

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5-7 February 2020

Poster 23

Abstract Presenter:
Bitakbiri Borujeni
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Introduction:

Triple-negative breast cancer (TNBC) is a type of breast cancer described by its poor prognosis and lack of therapeutic targets. Antiangiogenic therapy may prevent the growth of TNBC cells by blocking the growth of new blood vessels(1, 2). However, antiangiogenic drugs increase breast cancer stem cells through the generation of hypoxia in the tumor microenvironment (3). In this study, we constructed a Bispecific aptamer-siRNA chimera for co-targeting of angiogenesis and cancer stem cells for the efficient treatment of TNBC.

Methods:

Using bioinformatics software, a Bispecific aptamer-siRNA chimera was designed. Then, the primers and ssDNA templates were synthesized by Biobasic Company. Two RNA strands were generated by in vitro transcription using PCR product DNA as the template. Transcription was performed with the Apt-Get T7 transcription kit following manufactures instruction. After digestion of the DNA template using DNase, RNA transcription was checked by denaturing polyacrylamide gel electrophoresis (PAGE). Then, the transcribed RNAs were purified using ammonium acetate precipitation. Two RNAs with complementing sequences were annealed together by heating for 3 min at 95°C, and then slowly cooled to room temperature.

Results and Discussion:

We designed a Bispecific aptamer-siRNA chimera, which targets VEGF/EGFR/CD44 in one molecule. In this inhibitory molecule, a single VEGF siRNA is positioned between the CD44 and EGFR aptamers. We expect that CD44 and EGFR aptamers direct VEGF siRNA to internalize to the TNBC cells. In vitro transcription produces 30-50 µg of RNA aptamer per 3 µg of DNA template. Denaturing PAGE confirmed the in vitro transcription.

Conclusion:

In this study, we designed and constructed a Bispecific aptamer-siRNA chimera. Double targeting of CD44 and EGFR may increase siRNA delivery to cancerous cells compared to targeting one receptor. Further, in vitro and in vivo studies of this novel chimera molecule are underway.

Keywords:

Triple negative breast cancer, Angiogenesis, Breast cancer stem cell, Aptamer

References:

- Al-Abd AM, Alamoudi AJ, Abdel-Naim AB, Neamatallah TA, Ashour OM. Anti-angiogenic agents for the treatment of solid tumors: potential pathways, therapy and current strategies—a review. *Journal of advanced research*. 2017;8(6):591-605.
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Optimization, Characterization and Stability of Achillea Santolina Essential Oil Loaded in Niosome Nanocarriers

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5-7 February 2020

Poster 24

Abstract Presenter:
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Introduction :

Nanoencapsulation of Essential oils (EOs) in drug delivery systems such as Niosomes could help to improve stability and solubility. Using them as nanocarriers of medicine increases the therapeutic effects and reduces side effects. Achillea Santolina is an a perennial plant in the family of Asteraceae, with the main constituents of alpha-pinene, camphene, thymol, eugenol, P-cymene, 1,8 cineole, 3-2-ocimene, a- santonin, borneo, camphor, pinocarvone I, chrysanthenylactate. This plant has some medicinal uses including antidiabetic, antioxidant, anti-inflammatory, cytotoxic, antimicrobial, antitumor, spasmolytic and etc. The aim of this investigation is the optimization of a nano-sized formulation containing Achillea Santolina essential oil in niosome to study the anti-microbial and anti-inflammatory properties of this plant.

Methods :

Essential oil of Achillea Santolina was prepared with distilled water using a Clevenger device. The niosome was prepared by using a thin film lipid method, and then the synthesized nanoparticle was investigated in terms of size, zeta potential and release rate and loading.

Results :

The average size of the nanocapsules was 81.2 ± 2.7 nm with zeta potential of -34.54 ± 0.53 mV. The loading rate was 54.5 %, where the release rate in 25 °C was 26.5 % and in 37°C was 37 %.

Conclusion :

Using niosome as a nanocarrier could enhance stability of nano encapsulated essential oils compared to the uncoated essential oils.

Keywords:

Niosome, Achillea Santolina, nanocarrier, Essential oil

References:

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- 9-Si XT , Shang , ML , Shi QW , and

Formulation and Evaluation of Cephalexin Nanohydrogel for Topical Drug Delivery

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5-7 February 2020

Poster 25

Abstract Presenter:

Sara Salatin

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Mitra Jelvehgari

Introduction:

Bacterial skin infections are very common, with presentations ranging from subtle to alarming. Treatment of skin infections typically involves local wound care along with antibiotic therapy. However, bacterial infections continue to impose significant challenges on global healthcare because of the rapid emergence of antibiotic resistance. There have been numerous studies, especially based on nanoparticles (NPs) due to improving the targeted delivery of antibiotics toward the infected cells as well as enhancing their physicochemical properties.

Methods and Results:

The aim of the present study was to develop in-situ hydrogel-forming nanosystems as a promising platform for topical antimicrobial delivery. For this, cephalexin NPs were prepared and characterized by scanning electron microscopy (SEM), size and zeta potential, loading efficiency, and Differential scanning calorimetry (DSC) spectra. Nanohydrogel formulation was then formulated using the prepared NPs and analyzed in terms of physicochemical characteristics and ex vivo drug permeability. NPs were nano-sized (about 150 nm) with a negative zeta potential and spherical in shape. DSC studies confirmed the preparation of drug-loaded NPs. Ex vivo permeability profile of the nano hydrogel showed an acceptable skin permeability compared to the untreated drug.

Conclusion:

Our results indicated the potential of the prepared nano hydrogel as a controlled release system to improve the therapeutic effect of the drug through the topical administration. This work was supported by the National Institute for Medical Research Development (NIMAD) [Grant number 977515].

Keywords:

Drug delivery, Hydrogel, Infection, Nanoparticles

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Electrospun nanofibers from aqueous extract of *Muscari neglectum* and antifungal properties investigation

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5-7 February 2020

Poster 26

Abstract Presenter:

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Elham Arkan

ABSTRACT:

In the present study, biocompatible nanofibers from aqueous extract of Crocodile were prepared and its antifungal effect was investigated. First, the Crocodile plant was collected and washed. The fresh flowers, stems, leaves and onions were extracted. Then, the extraction was lyophilized and different concentrations were prepared. The nanofibers from extract were prepared by electrospinning. The physicochemical properties of the nanofibers were investigated by Scanning electron microscopy, infrared spectroscopy, X-ray diffraction and Differential Scanning Calorimetry. In electrospinning process, two auxiliary natural polymers (gelatin and chitosan) were used. The toxicity of electrospun nanofibers on fibroblast and HUVEC cell lines was investigated. For anti-fungal activity tests, the appropriate amounts of nanofiber were placed on media with five different fungal species using two methods of disk diffusion. The results showed that the electrospun nanofibers had continuous and uniform structures and fibers prepared from polyvinyl alcohol/gelatin/chitosan/extract of root with 86.88% had better swelling and higher mechanical strength. The resulting nanofibers had no toxicity and their antifungal effect was confirmed. The results were indicated that the electrospun nanofibers from root of Crocodile are biocompatible, non-toxic and have antifungal and anti-microbial effect. The natural nanofibers can be used as a biocompatible and biodegradable drug delivery system.

Keywords:

Electrospun Nanofibers, Antifungal activity, *Muscari neglectum* Extract

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A.L.D. de Freitas, V. Kaplum, D.C.P. Rossi, L.B.R. da Silva, M.d.S.C. Melhem, C.P.

Green Synthesis and Characterization of Chitosan Bi (OH) 3 Nanostructures by Hydrothermal-Microwave Synthesis for Antimicrobial Effects

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5-7 February 2020

Poster 27

Abstract Presenter:

Fatemeh Mehrabi

*** Correspondance:**

Mehdi Ranjbar

Introduction:

Nanomaterials science is concerned with materials and systems whose structure and components exhibit particular physical and chemical properties due to their nanometric dimensions. The goal is to develop nanotechnology, control structures and, study the behaviors.

Method and Results:

nanocomposites synthesized by assistant hydrothermal-microwave method and physicochemical properties measured by FTIR, SEM, and AFM. then Minimum Inhibitory Concentration (MIC) method used to investigate the antibacterial effect of the composites. In this method after the first run with 8 concentrations and observation of results, we repeated the tests with 12 concentrations of nanocomposites. 19 small tubes and 12 large tubes, one 5 ml balloon and two 500 mL Erlenmeyer flask were used. To prepare 300 ml of Muller Hinton agar medium, 11.4 g powder weighed and poured into a 500 ml Erlenmeyer to dissolve. To prepare 100 ml of Muller Hinton broth, 2.1 g of powder weighed and dissolved in another 500 Erlenmeyer. Then 18 cc of solid medium removed by pipette and poured into each of the 12 large tubes and after the preparation of 12 concentration of nanocomposites in small tubes by broth medium, 2 ml of broth medium added to large tubes and the tubes closed. microbial suspension prepared at 7 left small tubes. And the inoculation occurred. The result read after 24 hours.

Conclusion:

Since the antimicrobial effects of chitosan nanostructures loaded by bismuth hydroxide nanoparticles had not been investigated before, this research first made nanoparticles at different stabilizing sizes and concentrations and then prepared microbial culture media using MIC method And tested on seven types of Gram-positive and Gram-negative bacteria and the result showed a synergistic effect of chitosan and bis

Keywords:

bismuth hydroxide, nano composite, chirosan

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Thermo/-pH responsive nanohydrogels for controlled release of doxorubicin

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5-7 February 2020

Poster 28

Abstract Presenter:

Mohaddeseh Nagavi

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ABSTRACT:

Nanohydrogels based on natural polymers have attracted extensive attention in biomedical applications due to their unique biocompatibility and biodegradability. The modification of such polymeric structure with thermo-sensitive and pH-sensitive moieties would result in the production of intelligent drug delivery system (DDS). In the current study, thermo and pH-responsive nanohydrogels (NHGs) based on chitosan (CS) as natural biomaterial was designed and developed.

For this purpose, N-isopropylacrylamide (NIPAAm) and itaconic acid (IA) were grafted onto CS by the free radical copolymerization method in the presence of crosslinker agent with different feed ratio, subsequently the NHGs were prepared by sonication method. The prepared NHGs were characterized by FT-IR, DLS, and UV-Vis spectroscopy methods. The thermoresponsive behavior of the prepared NHGs was confirmed by the lower critical solution temperature (LCST) measurement. Doxorubicin (DOX) was loaded into NHGs and its in vitro release was evaluated at different temperatures and pH values. The biocompatibility of the prepared NHGs was investigated via MTT assay in MCF-7 cells. The prepared NHGs indicated the size distribution around 200 nm and LCST around 39 °C. The NHGs showed the drug loading efficiency around 80% and release study confirmed sustained release behavior that was accelerated at lower pH values.

Based on these findings, the developed NHGs could be considered as a promising smart DDS for the efficient therapy of cancer.

Keywords:

Chitosan, Nanohydrogel, Doxorubicin, Thermosensitive, pH-sensitive

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Optimization of preparation method for nanoliposomal soluble Leishmania antigens and characterization of their physicochemical properties

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5-7 February 2020

Poster 29

Abstract Presenter:

Mahdieh Arabalsalmani

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Ali Badiie

ABSTRACT:

Numerous attempts have been made to produce an effective vaccine against Leishmaniasis, and many formulations have been proposed to this end. However, no satisfactory vaccine in humans has been approved for this disease yet.

Due to the studies conducted in this field, we selected a formulation required to be optimized. To catch the goal, different liposome preparation techniques and different buffers were studied as important factors in preparing the liposome formulation.

The soluble Leishmania antigen (SLA) and bovine serum albumin (BSA) proteins were used to prepare the products. Liposomes were prepared with 4 millimolar concentrations of DOTAP as a cationic lipid either individually or in combination with cholesterol. Then, some tests including average of particle size, surface charge, polydispersity index (PDI), and entrapment percentage of proteins has been done on the final products as well as quality study tests for presence of protein through SDS-PAGE method.

Ultimately, based on the obtained results, the formulation containing DOTAP and cholesterol (4 millimolar concentration each) prepared via the film method accompanied by sonication in the HEPES buffer was selected as the optimum formulation for the SLA-containing products, and the formulation containing DOTAP and cholesterol (4 millimolar concentration each) prepared via the film method accompanied by sonication in 5% dextrose solution was selected as the optimum formulation for the product containing BSA

Keywords:

Leishmaniasis, Vaccination, DOTAP, Cholestrole, Nanoliposome

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Formulation and physicochemical evaluation of a metformin bioadhesive film

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5-7 February 2020

Poster 30

Abstract Presenter:
Sara Salatin

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Introduction:

Metformin is the first medication prescribed for type 2 diabetes. However, the common gastrointestinal side effects of metformin limit its clinical application. The purpose of this study was to develop a bioadhesive film containing metformin nanoparticles to improve the bioavailability of drug via oral route.

Methods:

For this, metformin nanoparticles were prepared and characterized by size and zeta potential, Scanning electron microscopy (SEM), entrapment efficiency, and Differential scanning calorimetry (DSC) spectra. Films were then formulated using the prepared nanoparticles and analyzed in terms of physicochemical characteristics and drug release.

Results:

The SEM results verified the formation of spherical nanoparticles, the size of which was approximately 150 nm. The DSC revealed crystalline structure of drug. The prepared film showed good physicochemical properties as well as a sustained drug release profile after 8h.

Conclusion:

Taken all, it is concluded that the prepared film provides an efficient dosage form for the drug delivery via oral route which can enhance the therapeutic efficacy of drug.

Keywords:

Bioadhesive, Film, Polymer, Nanoparticles, Oral

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Fabrication and in vitro characterization of berberine sponges for oral mucositis

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5-7 February 2020

Poster 31

Abstract Presenter:
Hamed Vaezi

* **Correspondence:**
Azadeh Haeri

Introduction:

Oral mucositis is a cytotoxic, painful, and debilitating severe and common acute side effect of chemotherapy and/or radiotherapy. Berberine is a nonbasic alkaloid with various pharmacological activities specially antimicrobial, anti-inflammatory and analgesic effects. It seems that berberine can be effective in prevention and treatment of oral mucositis in cancer patients. The aim of this study was to design and characterize chitosan/ sodium alginate composite sponge for prevention and treatment of oral mucositis.

Methods:

Stock solutions of 1% w/v chitosan (CS) and 1% w/v sodium alginate (SA) in 1 w/w% acetic acid were prepared and berberine solution (1 mg/ml) was added. Then CS, SA and CS/SA mucoadhesive sponges were prepared in different weight ratios of CS to SA (1:0, 3:1, 1:1, 1:3 and 0:1) via a freeze-drying method. The prepared sponges were evaluated for their drug content, in-vitro drug release and in-vitro mucoadhesion. Releasing of berberine was determined during 24 hours in simulated saliva fluid (pH 6.8 and 37 °C).

Results:

Berberine was completely stable within 48 hours in simulated saliva fluid. All formulations were prepared successfully by the freeze-drying method. In-vitro drug release studies showed berberine release percentages at 10 h were 41%, 50%, 47%, 54% and 81% from 1:0, 3:1, 1:1, 1:3 and 0:1 CS/SA sponges, respectively.

Conclusion:

The in-vitro drug release studies results suggest CS:SA 1:3 is suitable as oral mucoadhesive sponge to carry berberine for prevention and treatment of oral mucositis in patients undergoing chemotherapy

Keywords:

Berberin sponge, mucositis

References:

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Antioxidant Rich Green Carbon Dots Synthesis and their Application in Drug Delivery

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5-7 February 2020

Poster 32

Abstract Presenter:

Sara Asariha

*** Correspondance:**

Neda Esfandiari

ABSTRACT:

Carbon dots are fluorescent nanoparticles with dimension less than 10 nm. Carbon dots are low toxic, biocompatible and good water soluble so they demonstrate wide application in drug delivery. They are capable to be used as anticancer drug carrier due to donor quenched nano surface energy transfer in visible sensing of drug release. Material and methods: A green source was used to synthesize carbon dots by hydrothermal approach under 170° C in 12 hours. Carbon dots solutions with different various pH values (3 to 11) were adjusted by NaOH and HCl. Then solutions were scanned by fluorescent spectrophotometer to investigate their maximum excitation wave length. Therefore, they were excited in maximum excitation to measure intensity. Also, the carbon dots solutions emitted under UV light. Results and Discussion: Maximum fluorescent intensity considered at pH 4 under spectrophotometer and UV light. Also, fluorescent intensity was decreased from pH 4 to 11 Previous studies show that in cancer cells pH are different from normal cells, and drug releasing mechanism in cancerous cells depend on pH notably. Documents proved that adjusting pH can give specificity to drug targeting in intracellular acidic compartments and endosomes. Different pH carbon dots solutions are differently protonated and it gives us wide range of charge to carry different kind of drugs. It is noteworthy that chasing carbon dots drug carriers depend on their fluorescent power. Conclusion: In conclusion, dispersed water carbon dots divulge new absorption and emission, required to their pH sensitive nature. This feature is purposed for diagnosing cancer cells and efficient drug delivery and release for therapeutic activities. This study can be developed for new approach to investigate and remediate cancer cells by efficient drug delivery systems.

Keywords:

Nanoparticles, pH sensitive, Drug delivery, Cancer cells

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Optimizing the synthesis of nanoparticles to increasing drug release efficiency in cancer cells

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5-7 February 2020

Poster 33

Abstract Presenter:

Sara Asariha

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ABSTRACT:

Nanotechnology is a field of science that incorporates particles having the dimension less than 100 nm. Nanoparticles are developing new approach in health including diagnosing, treatment, imaging, drug delivery, and industry. Carbon quantum dots are nanoparticles with the size less than 10 nm. They are tunable under UV-light and they have almost negative surface charge. Green source-based carbon quantum dots have attracted significant attentions due to their desirable biocompatibility, low-toxicity, high photostability, low cost, and water solubility. Green source carbon dots are synthesized by different approaches including hydrothermal and microwave. Natural red pigments found in vegetables and fruits are strong antioxidants. Plant-based colors have antitumor effects on various types of cancer cells and wide anticarcinogenic activity in human body. Material and methods: A plant with red pigments was used as precursor for carbon source by simple hydrothermal method. The achieved brown solution was observed under UV-light. Also, the properties of carbon dots were detected by DLS, UV-spectrophotometry, and zeta sizer. Results: The blue color have illustrated the excitation at room temperature under 360 nm wavelength. The size of nanoparticles was examined by dynamic light scattering technic that shows 5 nm. The surface charge of particles was determined by zeta sizer. the surface charge was -30.9 mV. Conclusion: It could be concluded by the achieved results that the size of the nanoparticles is at the range that it could be used in drug delivery purposes and pass through any barriers of the body. Therefore, it could potentially use as carrier. On top of all, the synthesized carbon dots have the potential to emit light. By these results, the synthesized carbon dots could be used both in therapeutic and diagnostic methods.

Keywords:

Carbon dots, Antioxidants, Drug delivery, Diagnostic methods

References:

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Optimization of process variables for the fabrication of quercetin

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5-7 February 2020

Poster 34

Abstract Presenter:
Pegah Cheshmehnoor
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Introduction:

Quercetin is one of the most prominent flavonoids in human dietary sources that has been recognized to possess numerous biological activities including anti-aging, anti-inflammatory, anti-infective, and anti-cancer. In spite of these beneficial properties, its application in pharmaceutical field is restricted due to its low water solubility and poor dissolution rate. Several approaches have been developed to overcome challenges associated with poorly water-soluble drugs, such as pro-drugs, lipid-based formulations, self-emulsifying systems and nanoparticle-based formulations. Nanosuspensions have emerged as a promising drug delivery strategy to overcome bioavailability challenges. The objective of this study was to develop quercetin nanosuspensions using a wet media-milling

Method:

Nanosuspensions were fabricated by wet media milling technique, using a planetary ball mill. Various surface modifiers (Tween80, poloxamer407, poloxamer188 and Labrasol) were evaluated for their stabilizing effects. Briefly, quercetin powder was dispersed in an aqueous solution containing appropriate amounts of surface modifiers. The obtained dispersion was loaded into a milling chamber containing zirconium oxide beads as the milling agent and grinding was performed at 500rpm. The milled suspension was separated by sieving and evaluated for mean particle size and PDI. Effect of different bead sizes (0.3-0.4vs.0.6-0.8mm) and milling time duration (30,60,90&120 min) was investigated on quercetin particle size.

Results:

The optimal formulation consisted of drug(5%) and poloxamer188(1.25%), prepared by milling at 500rpm for 90min with 0.3-0.4mm ZrO₂ beads and showed particle size of 316nm and PDI of 0.22 (Figure 1). Extending milling time above an optimum level, had a negative impact on quercetin particle size; possibly due to greater collision between the newly generated particles. According to data, using smaller beads resulted in lower particle size as the beads provided greater surface area for grinding

Conclusion:

Wet media milling method is an efficient particle size reduction technology and seems to be a promising approach for fabrication of quercetin nanosuspensions

Keywords:

Quercetin, wet media milling, nanosuspension

References:

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Kakran M, Sahoo NG, Li L. Colloids And Surfaces B, Biointerfaces. 2011;88(1):121-30.
Kawabata Y, Wada K, Nakatani M, Yamada S, Onoue S. International Journal Of Pharmaceutics. 2011;420(1):1-10.

Formulation and evaluation of the anticancer effect of Doxorubicin Conjugated Superparamagnetic Iron Oxide Nanoparticles (SPIONs) on 3D tumor spheroid model of MCF-7 cell line

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5-7 February 2020

Poster 35

Abstract Presenter:

Darya Zakerhamidi

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Jaleh Barar

ABSTRACT:

Breast tumor is the most prevalent cancer among women worldwide. Despite significant improvement in the treatment of this disease, drug resistance and recurrence are the main obstacles for successful therapy. Hence the development of novel strategies to combat this disease has attracted much attention. In the current study, superparamagnetic iron oxide nanoparticles (SPIONs) were conjugated to doxorubicin (DOX) as the most therapeutic regimen against breast cancer, for efficient drug delivery and targeting. Further a three-dimensional cell-based model, which mimics the in-vivo condition was used to evaluate the efficiency of Nano formulations as an anticancer agent.

Three-dimensional spheroids of MCF-7 cells were prepared by liquid overlay technique, and their morphology was evaluated by light microscopy and analyzed by ImageJ Rsoftware. Nanoparticles (NPs) were engineered by the synthesis of SPIONs, and conjugation to DOX and polyethylene glycol (PEG). The NPs were characterized physico-chemically by means of TEM, DLS, FTIR and drug release. The biological impact of NPs on the 7 and 14 day formed spheroids was evaluated using MTT assay.

Dynamic light scattering results showed that engineered NPs had a size of about 12-85 nm. The morphology of NPS were globular and appeared to be monodisperse as evaluated by transmission electron microscopy. Surface modifications, were also confirmed by the results of FT-IR spectroscopy. Drug release was higher at the pH of 6.4 as compared to pH 7.4. Our analyses, confirmed the successful fabrication of 3D structure of MCF-7 cells after 7 days of culture. The penetration of the NPs into the mass of spheroid was assisted by collagenase enzyme in biological concentration (1mg/ml), and MTT data showed cytotoxicity of NPs on the cancer cells in the spheroids.

Overall, we have engineered a suitable drug delivery system for DOX. Such nan system is believed to accumulated in the tumor site by enhanced permeation and retention (EPR) phenomenon, as well as external magnetic field. Then it can release its cargo drug in the acidic tumor microenvironment, and can penetrate into the deeper layers of tumor mass and can affect the viability

Keywords:

Doxorubicin, SPIONs, Breast Cancer, 3D spheroid, MCF-7 Cells

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Preparation and in vitro characterization of sirolimus exosomes as a potential cancer delivery system

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5-7 February 2020

Poster 36

Abstract Presenter:

Fatemeh Mehryab

* **Correspondance:**

Azadeh Haeri

Intorduction:

Exosomes are nanoscale cell-derived vesicles with a parental cargo considered to provide a desired novel drug delivery system (1). Recently, many nanodrugs were introduced in this field of study, focusing on the targeted delivery of chemotherapeutics (2). Sirolimus is a macrolide compound with the known mechanism of mammalian target of rapamycin (mTOR) inhibition which was applied as a part of chemotherapy regimens. Activation of mTOR may involve in tumor growth and metastasis and therefore mTOR inhibitors such as sirolimus can be used for cancer therapy (3).

Methods:

Exosomes were isolated from fibroblast cell culture media by ultracentrifugation and characterized by western blotting, dynamic light scattering (DLS), electron scanning microscopy (SEM) and atomic force microscopy (AFM). Characterized exosomes were loaded with sirolimus by different loading methods, incubation time and exosome/drug proportion were optimized through several experiments to maximize the entrapment efficiency. Moreover, the optimal sirolimus loaded formulation was characterized by western blotting, DLS, SEM, AFM and Fourier transform infrared spectrophotometry (FTIR). The drug release profile was further studies by high performance liquid chromatography (HPLC).

Results:

Western blotting verified the presence of CD9, CD63 and CD81 markers in purified exosomes. Among many prepared formulations with different loading method details, the exosome/drug proportion of 2:1 incubated in 37° C for 30 minutes exhibited the desired entrapment efficiency of 75.7 ± 6.5 . Vesicles were found to have a spherical structure by morphological studies. DLS data showed the size of 183.7 ± 3.7 nm with the polydispersity index (PdI) of 0.36 ± 0.03 and the measured zeta potential was -29.8 mV. The formulation released about 30% of the loaded drug in first 24 hours, followed by a sustained release profile resulting in the approximately 45% cumulative release after 21 days.

Conclusion: Fibroblast-derived exosomes can be potentially applied as a promising novel drug delivery system for chemotherapeutics to be used in the targeted treatment of different malignancies.

Keywords:

exosomes, sirolimus, drug loading, characterization, cancer

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Minoxidil niosomes as a propitious carrier for topical drug delivery

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Poster 37

Abstract Presenter:

Banafshe Ziashahabi

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Abbas Pardakhty

Introduction:

Minoxidil is the only topical treatment with FDA proven efficacy for treatment of Androgenetic alopecia (AGA). Minoxidil has poor skin penetration ability, and low solubility in water which limits minoxidil as a potent drug in treatment of AGA. Moreover, typical side effects of topical treatment with ethanol-based minoxidil formulations include irritative dermatitis (going along with pruritus), erythema, scaling and dryness which occur at the onset of therapy. Since most of conventional topical minoxidil formulations consist of propylene glycol-water-ethanol solution, to minimize the side effects and improve the therapeutic efficiency. Here, we report for the first time, the preparation and physicochemical evaluation of minoxidil niosomes.

Methods and Results:

We developed new niosome encapsulated minoxidil formulation composed of sorbitan esters (SpanTM), their ethoxylated derivatives (TweenTM) with cholesterol by lipid film hydration method. Four molar ratio were used. The suspension was centrifuged and the absorbance of the supernatant analyzed by UV spectrophotometer at the λ max. The morphological studies of niosomes of minoxidil have been done by using transmission electronic microscope (TEM). Size distribution were evaluated by Malvern size analyzer. Release rate of niosomal minoxidil was evaluated by Franz diffusion cell through abdominal skin of rat.

Results showed that the prepared niosomes has good physical stability depicted as unchanged size distribution curves during six month storage formulation composed of the highest encapsulation. The formulation prepared was stable at room temperature. Slow and biphasic release profile of minoxidil was also shown which could be contributed to slow diffusion of minoxidil through lipid bilayer.

Conclusions:

It can be concluded that niosomes can be used as stable carriers for topical delivery of minoxidil.

Keywords:

Minoxidil, Niosomes, AGA, Skin, Sorbitan esters

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Preparation and characterization of controlled released polymeric films containing quercetin and silver nanoparticles

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Poster 38

Abstract Presenter:

Reza Hosseinpour Moghadam

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ABSTRACT:

Postoperative adhesions are one of the most frequent and challenging issues in surgical practices; causing problems like increased operation time, abdominal pains and bowel obstructions. Emerging methods for preventing formation of postoperative adhesions are mainly based on blocking responsible molecular mechanisms and using physical barriers. Polymeric films made of biodegradable materials are suitable candidates for providing physical barrier in-situ. Furthermore, they can incorporate active agents which can interrupt the molecular pathways of adhesion formation. Here, we designed quercetin-loaded poly (ϵ -caprolactone) (PCL) polymeric films coated with Ag nanoparticles (NPs) to overcome this problem.

Polymeric films were prepared by solvent casting method and then coated with Ag NPs with in-situ reduction of precursor in alkaline condition. The formulations were characterized in terms of morphology, mechanical properties, stability, content and release profile of active ingredients. Samples were subsequently characterized by field emission scanning electron microscopy and atomic force microscopy. Atomic absorption spectroscopy and Energy-dispersive X-ray spectroscopy were used to determine properties of Ag NPs. Polymeric films ability to inhibit bacterial growth were tested by Kirby–Bauer test against *S. aureus*, *S. epidermidis*, *P. aeruginosa* and *E. coli*.

Results indicated that films possessed desirable physical properties such as flexibility and stability. Content of quercetin in films was more than 95%. In-vitro studies pointed out that optimum polymeric films showed burst release behavior (12% of total dose) in first 24 hours, followed by sustained release behavior of quercetin for over 30 days (75% of total dose). AFM results demonstrated spherical Ag particles with size of 254.0 ± 5.2 nm and AAS results showed that Ag was released from surface of films in a sustained manner. Coating films with Ag NPs improved antimicrobial effects against mentioned strains comparing to control groups.

We proposed that the controlled release polymeric films developed in this research can hold great potential in preventing formation of postoperative adhesions.

Keywords:

Controlled release, film, nanoparticle, quercetin, antimicrobial

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Preparation and characterization of Silica coated TiO₂ nanoparticles and bonding of doxorubicin through pH-Sensitive bonds for Drug delivery

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Poster 39

Abstract Presenter:

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Zahra Sobhani

ABSTRACT:

Antineoplastic drugs are usually expensive and cause many side effects; therefore, designing smart drug delivery systems will lead to higher efficacy and fewer side effects. TiO₂ nanoparticles are used as vehicles to deliver drugs to cancer cells. Their small size, low toxicity, high biodegradability, proper chemical stability, and low price makes them a suitable choice in drug delivery based on nanoparticles. This study was aimed for binding doxorubicin via Schiff-based bond, which is pH sensitive, on the surface of nanoparticles of TiO₂. In mild acidic, dry condition, and by using the right solvent, the nucleophilic reaction took place, and the Schiff-based bond was created. Covering agents, which include type 1 amine groups like APTES, was used to cover the TiO₂ nanoparticles. The drug loading amount was measured using an indirect method by the HPLC. Also, the amounts of drug release in pH 5 and 7.4 were measured during a week time. The presence of a thin layer of silica around the nanoparticles was approved via TEM photography, IR spectrum, DSC/TGA thermo-gram, and CHN. The results of the particle size showed improvement in the spreadability and hindering aggregation of the coated-TiO₂ nanoparticles. The size of TiO₂ nanoparticles changes from 247nm to 60nm, after silica coating. TGA of TiO₂ nanoparticles shows 4% reduction in weight and after silica coating reduction changed to 6% and demonstrated nanoparticle's surface changes. The amount of the released drug from TiO₂-Si-DOX particles in the pH 5 was close to 100 percent. Furthermore, the amount of the released drug from the coated-nanoparticles in pH 7.4 was not in the measurable criteria, which shows the high specificity of the bond created for delivering the drug to cancer cells, because the tumorous area has a lower pH than other parts of the body. By using this system, we can increase the efficacy of the drug and decrease the unwanted side effects.

Keywords:

TiO₂ nanoparticles, doxorubicin, pH-sensitive bond, drug delivery, novel drug delivery

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Preparation and characterization of sustained release sirolimus coaxial nanofibers as a potential local anti-cancer drug delivery system

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Abstract Presenter:

Rozhin Talimi

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Azadeh Haeri

ABSTRACT:

Currently, chemotherapy is one of the most common cancer treatments. Localized drug delivery systems play a critical role in treatment by accumulating therapeutic agents at tumor site (1). Nanofibers provide controlled drug release and localized delivery. In cancer, the mammalian target of rapamycin (mTOR) pathway is hyper-activated. mTOR inhibitors like sirolimus, have attracted great attention as anti-cancer agent (2). The aim of this study was to develop a biocompatible sustained release nanofibrous drug delivery system for sirolimus.

Sirolimus coaxial nanofibers were prepared from chitosan 0.5 wt.% in TFA and polycaprolactone (PCL) 10 wt.% in hexafluoroisopropanol (HFIP) as shell components and PCL 10 wt.% in HFIP with drug to polymer weight ratio of 1:5 as core components. Solutions were electrospun with rate of 0.7 mL/h and voltage of 20 kV. The hydrophilicity of nanofibers was characterized by water contact angle and water uptake measurements. Morphology was studied under scanning electron microscopy (SEM), Atomic Force Microscope (AFM) and transmission electron microscopy (TEM). Drug release profile was evaluated by dialysis bag method. The X-ray powder diffraction (XRD), Fourier transform infrared spectroscopy (FT-IR) and mechanical characteristics of nanofibers were evaluated.

Presence of chitosan in nanofibers promoted hydrophilicity as water contact angle and water uptake percentage was 90.67° and 415.73% in core-shell nanofibers compared with 105.67° and 58.65% in PCL nanofibers. Fibers with an average diameter of 724.82 nm and smooth surface were observed. The core-shell structure of nanofibers was confirmed by TEM. Sirolimus release from coaxial nanofibers was 20.36±2.27% over 120 hours compared with monolayer nanofiber with 45.87±3.11%. XRD spectra indicated that crystal structure of sirolimus altered to amorphous in nanofibers, although FTIR spectrum demonstrated no significant interactions among components. The results suggested coaxial nanofibers resisted stretching 3 times more than monoaxial sample. These results suggested that the electrospun PCL based sirolimus nanofibers can offer an effective controlled release delivery system.

Keywords:

Nanofibers, sirolimus, cancer, controlled release nanosystem, polycaprolactone

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A Novel Piperine Encapsulated Polycaprolactone Nanofiber as a "Potential Anticancer Mat": Preparation and in Vitro Characterization

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Abstract Presenter:

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Azadeh Haeri

Introduction :

Considerable efforts have been devoted to developing appropriate chemotherapeutic delivery systems. However, further investigations on new approaches are still required. Recently, polymeric nanofibers have gained great attentions, being used as wound healing membranes, tissue engineering scaffolds and particularly as drug delivery vehicles. Poly ϵ -caprolactone (PCL) has been widely utilized in biomedical fields owing to its biodegradable and biocompatible nature. Piperine, the dominant alkaloid in black pepper, is well known for the benefits of antitumor, antioxidant, anti-microbial and anti-inflammatory activities. The aim of the present work was to fabricate and fully characterize PCL electrospun nanofibers containing piperine as a promising implantable anticancer mat .

Methods:

Briefly, 8% (w/v) solution of PCL in HFIP containing piperine (at drug: polymer weight ratio of 1:15) was prepared for electrospinning process. SEM and AFM analysis were carried out to investigate fiber size and morphology. FTIR, DSC and XRD were employed to characterize chemical composition, thermal behavior and crystallinity, respectively. Tensile testing was performed to evaluate mechanical properties. Drug release profile was also studied in phosphate-buffered saline (pH 5.4 and 7.4) at 37°C for 30 days .

Results and Discussions:

SEM and AFM images demonstrated bead-free and uniform nanofiber morphology with an average diameter of about 365 nm. FTIR analysis showed no interaction between ingredients. The DSC scans confirmed the amorphous status of piperine in the nanofiber. XRD analysis revealed evenly distribution of the drug in the formulation in an amorphous form which was in excellent accordance to the DSC results. Additionally, the prepared nanofibrous mat exhibited good mechanical properties. The in vitro release studies exhibited a sustained release profile, with drug release of 17% and 58% at pH 5.4 and 19% and 65% at pH 7.4 within the 1th and 30th day, respectively .

Conclusions:

Therefore, our results indicated that the proposed piperine-loaded PCL nanofibrous mat may offer a promising implantable controlled delivery system for anticancer agents.

Keywords:

Piperine, Nanofibers, PCL, Anticancer, Implant

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Curcumin nanostructured lipid carriers in treatment of lymphoma

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Abstract Presenter:

Setareh Jandaghian

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Jaleh Varshosaz

Introduction:

Curcumin extracted from the turmeric powder, a natural compound routinely used as a food spice, is seen to have anti-cancerous effects. The mechanism of this drug is the inhibition of STAT3 and NF- κ B signaling pathway, inhibition of Sp-1 expression, which has a significant effect in the prevention of cancer formation, immigration and invasion, anti-angiogenesis effects and anti-oxidation and ROS scavenging (1-3). The problem with this substance is its poor water solubility and thus poor drug delivery to the site of action. To vanish this problem, this study was conducted for better delivery of curcumin to cancerous sites in the form of nano lipid carriers (NLCs) (4).

Methods and Results:

The optimized NLCs were obtained by dissolving 10 mg of lecithin and 25% of oleic acid with 7.5 mg of curcumin in 2 ml of organic solvents (1 ml ethanol and 1 ml acetone) and adding the mixture to 20 ml of deionized water containing 0.5% Tween 80 under constant stirring. The cytotoxicity of curcumin NLCs was then studied on Jurkat T cells and Ramos B cells, two kinds of lymphomas, by MTT assay and the cellular uptake was determined by fluorescent microscopy.

The results indicated curcumin NLCs had a significant cytotoxic effect much higher (P0.05) than curcumin free powder dose dependently in almost all concentrations and in both cell lines while 15 μ g/mL of curcumin NLCs had a cytotoxic rate of 10.9% compared to 36.92% in Jurkat cells and 10.9% compared to 28.8% in Ramos cells showing that curcumin loaded NLCs not only didn't affect the cytotoxic effects of curcumin, but also improved the delivery of the drug to the cancer cells.

Conclusion:

The delivery of curcumin in the form of nano lipid carriers may enhance its cytotoxicity in the treatment of lymphomas.

Keywords:

Curcumin, Nanolipid carriers, lymphoma, Ramos cell line, Jurkat cell line, 4UHLVY9A

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An in silico method based epitope mapping of HER2 protein according to molecular imprinting for targeted drug delivery

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Abstract Presenter:

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Hamid Madanchi

Introduction:

Molecular imprinting is a powerful way for preparing molecular shapes, with high cross linked polymeric materials. Molecularly imprinted polymers (MIPs) are artificially prepared receptors that can recognize and specifically bind target molecules. Conformational epitopes (such as HER2) of tumor antigens are good targets for targeted drug delivery. Therefore, epitope imprinting polymers (EIPs) are great tools for this purpose. Conformational epitopes possess a three-dimensional shape that is recognized by the B lymphocyte receptor. Appropriate epitopes can be designed by in silico methods (Immunoinformatics methods).

Methods and Results:

At first, human HER2 protein sequence was extracted from NCBI and Uniprot databases and this sequence was used for epitope mapping. HER2 epitopes were designed by using ElliPro software (from IEDB server). Next, the most powerful epitopes were selected based on software score. Ellipro software works based on SVM (support vector machine) machine learning algorithm. Among the predicted epitopes by software, the highest scoring epitope was selected after the investigation of alignment these epitopes by protein BLAST. Eventually, the structural properties of the selected epitope were examined with JSmol software. The best conformational epitope (from residues 293 to 319) with NH₂-CPLHNOEKCSKPCARV-COOH sequence from epitope mapping step was selected. This epitope, which scored 0.678, contains 16 amino acids had good shape for molecular imprinting. Also, the BLAST of epitope sequence showed that this sequence is only present in the HER2 receptor family. Epitopes with a disulfide bond between C293 and C316 were synthesized in order to use in our operational phase in future studies.

Discussion and Conclusion:

Targeted drug delivery is one of the best ways to reduce chemotherapy side effects. The use of monoclonal antibodies (mabs) is one of the most important strategies in this process that their production is very complex and expensive. Epitopes of tumor markers are specific target and promising for selective drug. delivery to cancerous tissues by applying in EIPs technology. In silico based design is excellent strategies

Keywords:

In silico drug design, Immunoinformatics, MIPs, HER2, Epitope, mapping

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The application of pH-sensitive carbon dots for diagnosis and treatment of cancer

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Abstract Presenter:

Elham Rashidi

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Neda Esfandiari

Introduction:

In cancer treatment, nanobiotechnology is gaining an important role as it can be used for early detection, diagnosis and therapy. In recent years, the light-emitting carbon dots have gained attention due to their small size and surface characteristics for binding and imaging of cancer cells.

Material and Methods:

The carbon dots were synthesized from citrus as a green source by hydrothermal procedure. To investigate the influence of different pH values, carbon dots solutions were used. Carbon dots with different pH values (5, 7, and 10) were adjusted by 0.5M NaOH. Then fluorescent intensity spectra were measured with fluorescent spectrophotometer at the maximum excitation in 350 nm and UV light.

Results and Discussion:

The fluorescent intensity of carbon dots increased from pH 5 to pH 10. The maximum intensity was seen at a pH of 10 under spectrophotometer and UV light. Other studies also reported that the pH of cancer cells is different from that normal cells. It has been found that pH in cancer cells is decreased compared to normal cells. It is widely accepted that the drugs penetrate much higher at lower pH. Beside this finding, we demonstrated the fluorescent intensity at pH 5 is much less than pH 7 and pH 10. So luminescence carbon dots follow intracellular trafficking and drug delivery in cancer cells. Conclusion: In conclusion, pH-sensitive carbon dots were employed for the diagnosis of cancer cells and the controlled-release drug delivery in cancer cells. This study can be used to pH-sensitive carbon dots for diagnosis and treatment as a new platform.

Keywords:

carbon dots, cancer cell, pH-sensitive, therapy, imaging

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Niosome formulation and physicochemical characterization of ethanolic extract of Mazo (*Quercus infectoria G. Olivier*) and Yarrow (*Achillea wilhelmsii C. Koch*) as potentially depigmenting agent

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5-7 February 2020

Poster 45

Abstract Presenter:

Anis Ashrafzadeh

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Introduction:

Tyrosinase enzyme plays a key role in the biosynthesis of melanin. Niosomes are vesicles composed of non-ionic surfactants that are relatively nontoxic, stable and inexpensive. It is also one of the best drug carriers and is a replacement for liposomes. The aim of this study is the formulation and physicochemical evaluation of niosomes containing ethanolic extract of Mazo (scientific name: *Quercus infectoria G. olivier*) and Yarrow (scientific name: *Achillea wilhelmsii C. Koch*), which have shown acceptable inhibitory effects on tyrosinase in previous studies.

Methods and Results:

The extract of the plants was prepared by maceration in ethanol 80% for 72 hours. Non-ionic surfactant vesicles were prepared by film hydration at 60°C using a lipid compound containing sorbitan esters (Span 20,40,60,80) and polyoxyethylene sorbitan esters (Tween 20,40,60,80). Vesicles were morphologically studied by optical microscope. size analysis of vesicle was carried out by laser light scattering method. Percentage of Mazo extract was 3% and yarrow 2%. The total phenolic compounds equivalent to gallic acid mazo and yarrow were calculated 9.74 and 8.90 W/ W (% , respectively. All surfactants of Span (20, 40, 80, 60) and Tween (20, 40, 60, 80) were capable of forming non-extracted niosomes and niosomes containing 2% of yarrow extract. But the niosomes containing the Mazo extract did not form. Microscopical observation showed round and large vesicles which are formed in film hydration method. The niosome suspension consisting of Span 60 / Tween 60 / cholesterol with a molar ratio of 25/25/50 was selected as the best formulation. This best niosomal formulation had high physical stability and acceptable percentage of entrapment of extract (55.9%). In the extract release test, 30% of the extract passed through the cellophane membrane after 240 minutes.

Conclusion:

Prepared niosomes are highly stable during the formulation and encapsulation. These new drug delivery systems are easily and cheaply manufactured. If further studies can confirm the safety and efficacy of the product, topical anti hyperpigmentation formulations of this product may be offered.

Keywords:

Noisome, Mazo, Yarrow, physicochemical, characterization, depigmenting agent

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Development of surface modified NLCs for enhanced delivery of sunitinib toward lung cancer cells

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5-7 February 2020

Poster 46

Abstract Presenter:

Somayeh Taymouri

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Somayeh Taymouri

ABSTRACT:

Lung cancer is a one of the most leading cause of cancer related death in both primary and metastasis neoplasms. Sunitinib (SUN) is a multi-targeted tyrosine kinase inhibitor with anti-tumor and anti-angiogenic activities. SUN exhibited clinical activity against NSCLC, but its application is greatly limited by its adverse and undesirable systemic toxic effects. The targeted delivery of SUN could reduce systemic toxicity while maintaining local anti-tumoral efficacy. In present study, we developed biotin functionalized NLCs for the SUN delivery to overcome this limitation. SUN loaded biotin targeted NLCs (biotin-SUN-NLCs) were prepared by emulsion-solvent diffusion and evaporation method and optimized using irregular factorial design. The morphology of optimized NLCs was studied using SEM. The cellular toxicities of free SUN, SUN-NLCs and biotin-SUN-NLCs in A549 cells were studied by MTT assay which are known to express high level of biotin. The optimized formulation presented spherical particle with a mean size of 125.50 nm, 85.10% EE, zeta potential of 10.23 mV, drug release efficiency of about 62.85% during 8 h and PdI0.3. Statistical analysis using Design Expert Software showed the most effective factor on the particle size is surfactant concentration. By increasing PF127 concentration from 0.5% to 1%, particle size increased. This could be due to particle aggregation induced by increasing the medium viscosity which accompanies increasing PF127 concentrations. Furthermore, employing higher concentration of PF127 reduced the mixing speed during preparation which in turn caused formation of larger NPs. Biotin-SUN-NLCs showed significantly higher cytotoxic effect in lung cancer A549 cells overexpressing biotin receptor compared to that of non-targeted NLCs and free SUN. The Flow cytometry and fluorescent microscope demonstrated that the biotin-NLCs exhibited higher cellular uptake in A549 human lung cells than non-targeted NLCs. In conclusion, it can be suggested that biotin-SUN-NLCs have advantages and potential for targeted lung cancer therapy

Keywords:

Lung cancer, sunitinib, nanostructured lipid carrier, biotin, active targeting

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Triamcinolone acetonide loaded Folate-targeted nanoparticles: amphiphilic and hydrophobic polymers

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Abstract Presenter:

Amirhossein Vosoughi

* **Correspondance:**

Leila Behbood

Introduction:

Polymeric nanoparticles have been extensively studied as particulate carriers in the pharmaceutical and medical fields .

Materials and Results:

The triamcinolone acetonide incorporated folate-conjugated biocompatible polymers were prepared in the present work for evaluation of the profile of in vitro release. The loading of triamcinolone acetonide in the amphiphilic polymer (chitosan) and the hydrophobic polymer (poly- (lactic-co-glycolic acid)) nanoparticles were characterized. The surface of obtained carriers was being modified with folic acid (FA) and drug leakage were investigated in the reaction time. Chitosan nanoparticles (CS NPs) were prepared using an ionic gelation method. The FA coupled CS NPs (FA-CS NPs) were synthesized via carbodiimide activation. PLGA NPs were prepared by the nanoprecipitation method and the PLGA NPs coupled to FA using carbodiimide activation. The obtained NPs were being characterized by scanning electron microscopy and Fourier transformed-infrared spectroscopy. FTIR study showed a better coupling of folic acid on the surface of chitosan nanoparticles. The in vitro drug release was investigated using immersed dialysis bag method and the positive effect of folic acid conjugation on the increase of the drug release was proved .

Conclusion:

The folate conjugated drug loaded Chitosan-PLGA nano particles were prepared successfully. Investigations and characterizations showed suitable physicochemical properties and proper drug release behavior for the system. This nanoparticle can be considering as a novel drug delivery system for pharmaceutical dosage forms.

Keywords: Folic acid, Chitosan, poly-(lactic-co-glycolic acid), Triamcinolone acetonide

Keywords:

Folic acid, Chitosan, poly- (lactic-co-glycolic acid), Triamcinolone acetonide

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Multifunctional magnetic core-shell nanoparticles for imaging and therapy in cancer

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Poster 48

Abstract Presenter:

Farzaaneh Zaaeri

*** Correspondance:**

Hamid Akbari Javar

Introduction:

Nanoparticle-based targeted drug delivery provides a safe and effective therapy. However, long and multi-stage production still remains a challenge. Despite number of FDA approved nanoparticle-based DDSs for treatment of cancer, a decisive and effective system has not been suggested yet; and existing systems and methods have many disadvantages. Efficient and reliable targeting, longer staying of NPs in the bloodstream to reach the target cells after intravenous injection, prevention of nanoparticles to be removed from the body by immune system, controlled drug release and having a cause of distinction in an imaging method, are ideal goals in cancer therapy.

Methods and Results:

A pH responsive polymer derived from polyethyleneimine with zwitterionic function was used as a shell around Super Paramagnetic Iron Oxide Nanoparticles to introduce an efficient drug carrier for cancer drug delivery and imaging. Modified Polymer was tested about molecular structure, and the final drug carrier was identified and evaluated for morphology, size and surface charge, crystal structure. The loading efficiency and doxorubicin released amount in the acidic pH after one week were analysed and diagnosed in accordance with the proposed hypothesis. Pharmacokinetics and tissue distribution were determined after intravenous injection of appropriate doses of nanoparticles in normal male rats. Toxicity and potency in vivo were examined by injecting the appropriate dose of nanoparticles to healthy and tumor mice, respectively, and body weight, tissue pathology and tumor size were analysed. The impact of increased penetration of nanoparticles targeted with folic acid in cancer cells was approved by fluorescence microscopy imaging of organs and the tumor. The impact of accumulation of targeted magnetic nanoparticles at the tumor site in the presence of an external magnet was tested and approved by MRI method.

Conclusion:

According to the results of the tests, a new kind of nanoparticles as a drug delivery system, with several targeting strategies for simultaneously drug delivery and imaging was proposed and can be used to treat tumors.

Keywords:

Magnetic nanoparticles, Drug delivery system, pH responsive, polyethyleneimine, Doxorubicin

References:

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Preparation and Evaluation of Characteristics of Liquid suppository of Sumatriptan

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5-7 February 2020

Poster 49

Abstract Presenter:

Mina Tarzamani

* **Correspondance:**

Mitra Jelvehgari

Introduction:

The aim of the present work was to develop an in situ thermosensitive rectal gel for sumatriptan by using Expert-design for improving several parameters such as therapeutic efficacy and patient compliance.

Methods: Experiments were conducted according to a modified Box-Behnken design with three factors and a three-level process was formed by using a cold method. Response surface design was utilized to investigate the effect of independent variables like sumatriptan (X1), poloxamer 407 (X2) and chitosan (X3), on different dependent variables such as gelation temperature, gel strength, drug content, differential scanning calorimetry (DSC), dissolving/erosion and detachment force, along with permeation and stability.

Results & Discussion:

The selected formulations (i.e., S2, S8, S11, and S13) had the gelling temperature of ranging 28, 29, and 30°C, respectively. The gel strength and drug content varied between 215-271 seconds and 0.045-0.065%, respectively. However, mucoadhesive strength was 50.95-58.02 N/cm² for providing prolonged adhesion. The obtained results revealed that the addition of chitosan enhanced the temperature of the gelation of hydrogel while it increased the strength of the gel and mucoadhesive force. The DSC showed that the crystalline state of the drug was unstable in the hydrogels.

Conclusion:

It is suggested that in situ hydrogels may be suitable candidates for sumatriptan rectal delivery.

Keywords:

Sumatriptan Rectal, Poloxamer 407, In situ thermosensitive, Chitosan

References:

Choi H-G, Jung J-H, Ryu J-M, Yoon S-J, Oh Y-K, Kim C-K. Development of in situ-gelling and mucoadhesive acetaminophen liquid suppository. *International Journal of Pharmaceutics* 1998,165, 33 – 44.

Jadhav UG, Dias RJ, Mali KK, Havaldar VD. Development of In Situ-Gelling and Mucoadhesive Liquid Suppository of Ondansetron. *International Journal of ChemTech Research*. 2009,1(4),953-61.

Keny RV, Lourenco CF. Formulation and evaluation of thermoreversible in situ gelling and mucoadhesive diltiazem hydrochloride liquid suppository. *International Journal of Pharma and Bio Sciences* 2010,1(1),1-17.

Synthesis of new derivatives of atorvastatin

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5-7 February 2020

Poster 50

Abstract Presenter:

Shiva Najafi

*** Correspondance:**

Shiva Najafi

Introduction:

Cholesterol is one of the biomolecules in the body of fats. This molecule has a 27 choices multicellular structure. Its main role is to strengthen and flex the cell membrane and also in the blood. Because cholesterol is essential for the life of all animals

Each cell makes it easier than molecules. A complex 37step process that begins with HMG-CoA Reductase an intracellular protein enzyme. However, in addition to the general level of circulating fat and cholesterol, the type of lipoprotein found is also strongly associated with the progression of atherosclerosis. Atorvastatin is a statin or enzyme inhibitor 3. HMG CoA hydroxy; 3. Methylglutaryl coenzyme A reductase and a lipid-regulating drug with function on plasma lipids. Drugs used in the treatment of hyperlipidemia, LDL cholesterol, triglycerides and apolipoprotein B decreased and HDL cholesterol increased. Worldwide pharmaceutical forms include 10 mg, 20 mg and 40 mg tablets.

Methods and Results:

In the chemistry laboratory, using the facilities available in the laboratory, Friedel Crafts reacted with atorvastatin acetyl chloride phenyl rings and synthesized acylated derivatives .

Conclusions:

The newly synthesized derivatives were identified and analyzed by HNMR and FTIR tests. The results show that new derivatives of atorvastatin have different chemical and pharmacological properties compared to their original structure.

Keywords:

Atorvastatin, HMG CoA Reductase, Cholesterol, Friedel Crafts

References:

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Synthesis of phenylthiosemicarbazone and thiadiazole derivatives and evaluation of their anti platelet aggregation activity

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5-7 February 2020

Poster 53

Abstract Presenter:

Mahsima Khakpash

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ABSTRACT:

Cardiovascular and thromboembolic diseases are the leading cause of death for many patients around the world. Drugs used today to treat these diseases, such as aspirin and clopidogrel, have side effects such as bleeding and gastrointestinal disorders. Therefore, attempts to find new antiplatelet drugs is one of the researchers' goals. A structural feature that is present in many antiplatelet compounds is a hydrazone-like agent. Several studies have shown that compounds containing hydrazine functional group in their structure, can have a significant antiplatelet effect.

Therefore, in the present study, a group of phenylthiosemicarbazone and thiadiazole derivatives was synthesized by the reaction of aromatic aldehydes with phenylthiosemicarbazide. The structure of synthesized compounds was confirmed by IR, NMR and Mass spectrometry methods. Investigating the antiplatelet effects in the presence of arachidonic acid (AA) and adenosine diphosphate (ADP) inducers, showed that some compounds have satisfactory antiplatelet effect. Compound 2- (3-hydroxybenzylidene) -N-phenylhydrazine-1-carbothioamide (A2) was the strongest synthesized compound in this study and the value of IC₅₀ was measured about 167/7 μM in the presence of arachidonic acid.

Keywords:

anti platelet aggregation activity, hydrazine, thromboembolic

References:

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Preparation of a nano-capsule based on gum tragacanth hydrogel containing *Trachyspermum ammi* essential oil and its antioxidant, antibacterial and anticancer properties.

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5-7 February 2020

Poster 54

Abstract Presenter:

Sajjad Partovi

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Sajjad Partovi

ABSTRACT:

Today, not only in Iran but around the world, the tendency to herbal medicine has increased. Medicinal herbs are rich in compounds that have therapeutic properties such as antibacterial, antioxidant, anticancer, and so on. Considering the necessity of using these compounds and their valuable benefits for humans, extraction and application of medicinal plants extract has been considered. Therefore, finding a suitable way to use the therapeutic properties of these herbs to maintain its quality seems necessary. The aim of this study was to prepare nano-capsules containing essential oils of women using tragacanth hydrogel and to investigate its antioxidant, antibacterial and anticancer properties. The herb is one of the medicinal species that has many therapeutic properties including anti-bloating, nausea, sputum and rheumatic pain relief. For this study, the essential oils of women were extracted and then transformed into nano-capsules using tragacanth hydrogel. In this study the antimicrobial effects of different extracts of this plant on Gram positive and negative bacteria on diffusion disk were investigated and its antioxidant activity was tested using DPPH. In addition, the inhibitory effects of nano-capsules on cancer cells were investigated. For this purpose, these cells were affected by different concentrations of plant extracts at different times. Then microscopic and MTT assays were performed to investigate the cytotoxic effects of the plant extract.

Keywords:

Ultrasound, cancer, hydrogel, tragacanth, essential oil

References:

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Preparation of paramagnetic biological nano-hydrogel based on tragacanth gum and study of its swelling ratio and targeted drug delivery

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5-7 February 2020

Poster 55

Abstract Presenter:

Sajjad Partovi

*** Correspondance:**

Sajjad Partovi

ABSTRACT:

Hydrogels are 3D polymer networks with the ability to absorb water or biofluids several times its weight, which are used in countless cases of medicine and biomedicine, as drug delivery agents, tissue engineering skeleton, biological sensors, microfluidic system makers, a member of the eye lens, wounds and stitches manufacturing process. Nanocomposite hydrogels are produced by the introduction of various nanoparticles, such as metal particles, clay or ceramics inside a hydrogel matrix. Hydrogel nanoparticles, also called nano-gels, have a nanoparticle hydrogel structure that exhibits the properties of hydrogels and nanoparticles simultaneously. Nanogels have the ability to dampen bioactive compounds such as drugs, proteins, and DNA / RNA within nanoparticles in the polymer network.

Regarding the fact that natural polymers such as polysaccharides, in comparison with synthetic polymers, have good advantages such as biocompatibility and low toxicity, today they are very much considered in medical and pharmaceutical applications. Natural polymer tragacanth gum is used in pharmacy as a gel maker, suspension agent in oil in water, gels and toothpaste emulsions, stabilizing in creams and skin lotions and binders in the preparation of pills and medications, and micro-coating of various materials, such as vitamins.

In this study, composites were prepared based on Fe₃O₄ nanoparticles coated with silica gel and modified by vinyl groups. The modified nanoparticle was reacted with tragacanth gum to hydrogen bonding between the two compounds. The naproxen drug was then added to the final nanohydrogel. UV-vis spectroscopy was used to ensure drug loading. After, the drug release phase was tested and again UV-vis spectroscopy was used. Also FT-IR spectroscopy was used to identify modified nanoparticles. The surface morphology and distribution of nanoparticles in tragacanth nanohydrogel were also evaluated by electron microscopy (SEM).

Keywords:

Nanoparticles, nanocomposite, tragacanth gum, naproxen, nanohydrogel

References:

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Kim, J. E., Shin, J. Y. & Cho, M. H. (2012). Magnetic nanoparticles: an update of application for drug delivery and possible toxic effects. *Archives of Toxicology*, 86, 685-700

Design, synthesis and in silico ADMET Prediction studies of 1-(2-phenyl-2-oxoethyl)-2 aryloylbenzimidazoles derivatives as potential new anti-platelet agents

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5-7 February 2020

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Abstract Presenter:

Melika Saffari

***Correspondance:**

Masoud Faghieh Akhlaghi

Introduction:

Antiplatelet agents have a key role in treatment of cardiovascular disease which is the leading cause of death worldwide. Adenosine diphosphate (ADP) plays a key role in platelet aggregation. It has been proved that compounds with similar structure to purine base are competitive ADP receptor antagonists. Benzimidazole is a purine analog and in the present study, various 2-aryloylbenzimidazoles and 1-(2-phenyl-2-oxoethyl)-2 aryloylbenzimidazoles derivatives were synthesized and their ADMET properties were predicted in silico.

Methods:

2-aryloylbenzimidazoles were synthesized by the reaction of benzimidazole and suitable benzoyl chloride. The prepared 2-aryloylbenzimidazoles were reacted with 2-bromoacetophenone in the presence of potassium carbonate in acetone. The reaction was monitored by TLC and after work up final product was recrystallized from ethanol. The structure of compounds was analyzed using IR, LC-Mass, NMR and the ADMET prediction of synthesized derivatives was evaluated in silico.

Results and Discussion:

The results of IR, LC-Mass, NMR analysis confirmed synthesis of derivatives as potential antiplatelet agents. In silico analysis of the physicochemical properties of compounds showed suitable ADMET properties. The molecular weight of compounds ranged from 222.25 to 374.83 (500), the value of log P ranged from 2.79 to 4.80 (5), the amount of H-bond donor (HBD) ranged from 0 to 1 (≤ 5), and the amount of H-bond acceptor (HBA) ranged from 2 to 5 (10). The results showed that all derivatives met the Lipinski Rules of Five, have high permeability and can be easily absorbed.

Conclusion:

Various 2-aryloylbenzimidazoles and 1-(2-phenyl-2-oxoethyl)-2 aryloylbenzimidazoles derivatives were successfully synthesized with proper physicochemical properties, being potential candidates for in vitro and in vivo platelet aggregation studies.

Keywords:

Benzimidazole derivatives, Platelet aggregation, Anti-platelet

References:

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New Structural Insights into the Selective Inhibition of the Phosphoinositide 3-kinase alpha

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Poster 57

Abstract Presenter:

Safoura Hariri

* **Correspondance:**

Behnam Rasti

Introduction:

Phosphoinositide 3-kinases (PI3Ks) are lipid kinases that play essential roles in several basic biological processes, including proliferation, survival, differentiation, and cell metabolism. The design of inhibitors to target the PI3K pathway has received much attention from both academic drug discovery centers and the pharmaceutical companies. The inhibitors cause cell death and prevent the proliferation of malignant cells by inhibiting the PI3Ks. Today, computer-based rational drug design methods are employed for identifying and developing new potent and selective pharmaceutical inhibitors. Herein, we utilized a proteochemometric (PCM) model as a bio-statistical approach for designing new inhibitors to enhance the robustness of the model for drug design and development .

Methods and Results:

The objective of this study is to apply the PCM to obtain a single predictive model to characterize the interaction space between multiple ligands and two isoforms of PI3K. Combining receptor and ligand information can facilitate identifying new isoform-specific PI3K inhibitors. The correlation between ligand/protein descriptors and biological activity was demonstrated using the PLS regression method. Several methods were applied to validate the predictivity and the robustness of the model. The results were in good agreement with the acceptance criteria. Applicability of the PCM model was confirmed via the design of novel ligands. In this way, new ligands with better potency and selectivity towards the PI3K α isoform were designed by structural modifications of the reference ligands .

Conclusions:

In the present study, a few novel ligands with better selectivity towards the PI3K α isoform were designed using the results of the PCM model.

Keywords:

PCM, PI3K α inhibitor, PLS regression method

References:

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Hologram quantitative structure-activity relationship (HQSAR) study for anticancer activities of 2-amino benzamide derivatives

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5-7 February 2020

Poster 58

Abstract Presenter:

Tooba Abdizadeh

*** Correspondance:**

Tooba Abdizadeh

Introduction:

At present, cancer remains a significant health problem worldwide. The numerous drugs have been used for the cancer treatment but have severe side effects. Consequently; increasing interest has been devoted to the design and discovery of more effective anticancer agents in current medicinal chemistry .

Methods:

In this work, Hologram quantitative structure-activity relationship (HQSAR) models using 2-amino benzamide derivatives were generated to discover the relationship between the different chemical structures and the anti cancer activity of agents. In the proposed HQSAR model, three fragment parameters, fragment distinction, fragment size and fragment length, were set to “A, C and H”, “4-7” and “53” respectively. Conventional validation techniques, internal and external validations such as, non-cross-validated correlation coefficient (r^2), cross-validated correlation coefficient (q^2) and predicted correlation coefficient ($[r]_{pred}^2$), were utilized to evaluate the forecasting accuracy of proposed model .

Results:

The HQSAR model (q^2 , 0.913; $[r]_{ncv}^2$, 0.998; $[r]_{pred}^2$, 0.871) for data set (training and test set) of anticancer agents yielded significant statistical results .

Conclusions:

The HQSAR contribution maps generated from these models illustrated that the yellow, blue, green-blue and green fields played key rols for improve the antiproliferative activity of anticancer agents. The final QSAR models could be useful for rational design and development of novel potent anticancer agents in cancer treatment.

Keywords:

HQSAR, anticancer, aminobenzamide, fragment distinction, fragment size

References:

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 Jiao L, Zhang X, Qin Y, Wang X, Li H. Chemometr Intell Lab Syst. 2016;157:202-7. 34

4chloro-7nitro benzofuran as a UV-labeling agent for determination of topiramate in bulk and pharmaceutical dosage form

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5-7 February 2020

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Abstract Presenter:
Mohammad Ranjbari
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ABSTRACT:

Topiramate, is a sulfamate- substituted derivative of The Monosaccharide D- fructose that has been approved for the treatment of epileptic disorder. Analysis of topiramate is complicated, because the molecule has no ultraviolet, visible or fluorescence absorption. There is noticeable shortage of methods for determination of the drug in pharmaceutical dosage forms and in in-vitro dissolution studies. In this study, we described a new, sensitive and simple method for quantification of topiramate as an anti-epileptic drug in pharmaceutical dosage forms and its bulk. The method is based on derivatization of topiramate and an internal standard by reaction with 4-chloro-7-nitrobenzofurazan (NBD-CL), and for that each topiramate tablet was suspended in 900 ml of distilled water and sampling was performed (500 μ l) at different times up to 45 min. All the samples were transferred to a disposable glass tube and After brief vortex mixing, 50 μ l of these solutions are sampled and subjected to derivatization. To each 50 μ l of the sample, 300 μ l NBD-Cl (500 μ g/ml in acetonitrile) and 25 μ l of borate buffer (pH 7.7) were added and after brief mixing for 10 s the samples were kept at 50°C for 15 min. The topiramate was derivatized with 4-chloro-7-nitrobenzofuran (NBD-CL) and followed by reverse-phase chromatography using phenyl column and UV detection at 264 nm. to determine topiramate concentration. The LOD was approximately 10 ng/ml at a signal to noise ratio of 3:1 and LOQ corresponding with a coefficient of variation of less than 20% was 5 ng/ml.

Chromatograms show the excellent chromatographic specificity without evidence of interfering of either topiramate degradation products or additive substances with .drug analysis during the study.

The results of dissolution test, showed that the two different dosage form of topiramate, are released up to 90% in 20 minutes' interval. This method has been used in comparative in vitro study of two different topiramate preparations and proved to be suitable for assay of the drug in in-vitro. bioequivalence studies of topiramate

Keywords:

Topiramate, Derivatization, Dissolution Study, Pharmaceutical Formulation, HPLC

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Method Development and Validation for Simultaneous Determination of Atorvastatin, Aspirin, Valsartan and Hydrochlorothiazide in Human Plasma

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5-7 February 2020

Poster 60

Abstract Presenter:

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Farzad Kobarfard

ABSTRACT:

Cardiovascular diseases (CVDs) are the first cause of mortality and disability worldwide. With the intention to improve treatment adherence and strengthen comprehensive CVD prevention plans, several approaches and interventions have been analyzed. The use of polypill, as a fixed-dose combination of several drugs, is one of the methods which has been investigated in the CVD field and numerous studies demonstrate that it significantly improves medication adherence. On the other hand, the monitoring of the plasma concentrations of drugs is crucial for understanding their pharmacokinetics and pharmacodynamics. A rapid, selective and sensitive HPLC method has been developed and validated for simultaneous determination of four drugs combined in a polypill composed of Atorvastatin (ATO), Aspirin (ASA), Hydrochlorothiazide (HCTZ) and valsartan (VAL) in human plasma. Optimum separation of the active ingredients was performed on a RP-C18 column using a gradient elution mode with a run time of 20 minutes. The mobile phase consisted of a mixture of 0.1% formic acid in water (mobile phase A) and 0.1% formic acid in Acetonitrile (mobile phase B), pumped at a flow rate of 1 ml/min. Elution was monitored by a UV detector at 225 nm. The retention time for HCTZ, ASA, VAL and ATO was 5.4, 11, 15.2 and 15.6 min respectively. The described method demonstrated excellent linearity with correlation coefficient values of 0.99 for all the drugs over a range of 1.5-150 µg/ml for HCTZ, 10-1000 µg/ml for ASA, 5-375 µg/ml for VAL and 2.5-250 µg/ml for ATO with the lower limit of quantification of 5.8 ng/ml, 0.6 µg/ml, 19 ng/ml and 0.15 µg/ml for HCTZ, ASA, VAL and ATO respectively. The intra-day precision (R.S.D.) values for all four components were below 9.46%, and inter-day R.S.D. values were all less than 6.9 %. Recoveries for all elements were within 93,16% and 103,72%. The proposed method was fully validated and showed an appropriate specificity, linearity, sensitivity and precision for all the analytes studied. The method was successfully applied for the quantitative analysis of a few plasma samples after consumption of polypill formulation containing the aforementioned four medicines.

Keywords:

HPLC, Atorvastatin, Aspirin, Hydrochlorothiazide, Valsartan

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Structure-based virtual screening, synthesis and biological activity studies for identification of novel HIV-1 integrase inhibitors derived from kojic acid scaffold

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Abstract Presenter:

Hajar Sirous

*** Correspondance:**

Hajar Sirous

ABSTRACT:

All FDA-approved anti-HIV drugs suffer from some inevitable drawbacks such as emergence of multi-drug-resistant HIV strains and drug toxicity. This is a concrete ground behind the substantial worldwide research to develop new more potent and less toxic anti-HIV agents. Among recent progress in anti-HIV drug design, targeting HIV-1 integrase (HIV-1 IN) has emphasized as a validated strategy for the development of novel anti-HIV agents. In this regard, we were particularly interested in taking advantage of the 3-hydroxy-4-pyranone (HP) scaffold for the development of novel HIV-1 INIs. Accordingly, a series of promising HP derivatives featuring a unique C-2 carboxamide moiety, namely 3-hydroxyl-pyran-4-one-2-carboxamide derivatives (HPCARs), were recently reported by us.

In our quest for the search of innovative and effective INIs and considering the above-mentioned findings, we described herein the development and experimental validation of an *in silico* protocol for identification of novel optimized derivatives exploiting the HPCAR chemotype. All computations were carried out using Schrödinger software package 2015. Starting from most potent HPCAR derivatives previously reported, a computational protocol combining a combinatorial library design procedure coupled to physicochemical properties prediction, extensive Quantum Polarized Ligand Docking (QPLD) studies, and Molecular Dynamics (MD) simulation was developed in a step-filtering approach. The combinatorial library design allowed the identification of the best decorations for our promising scaffold. In order to validate the proposed *in silico* strategy, three representative hits identified from this screening workflow were selected, synthesized and experimentally assessed *in vitro* for evaluating overall HIV-1 IN inhibition, HIV-1 IN strand transfer activity inhibition, HIV-1 activity inhibition and cellular toxicity. Gratifyingly, the representative hits showed low nanomolar inhibitory activity in the *in vitro* tests along with no toxicity. In summary, our encouraging results provided solid support for the potential exploitation of HPCAR scaffold in the development of HIV-1 INIs.

Keywords:

HIV-1 integrase inhibitors, combinatorial library design, hit compounds, optimization, kojic acid, synthesis

References:

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Design, synthesis and evaluation of some novel pyrazole-ferulic acid derivatives as LOX inhibitors

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Abstract Presenter:

Mojde Rahmani

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Mojde Rahmani

Introduction:

The 5-Lipoxygenase pathway provides potent pro-inflammatory mediators. An other factor that causes inflammation is ROS implicate in a variety of inflammatory disease, 4,5-Dihydropyrazole derivatives (heterocyclic molecules) and Ferulic acid have been received attention due to their anti-inflammatory and antioxidant effects. We have designed, synthesized and report biological activities of a series of pyrazole-ferulic acid hybrid compounds as LOX inhibitor and antioxidant agents.

Materials and Methods:

A novel series of pyrazoline-ferulic acid derivatives was designed and synthesized. The synthesis of chalcone was carried out by the Claisen-Schmidt condensation reaction. Then they were refluxed with hydrazine hydrate. Finally, they were added to a solution of ferulic acid and N,N-Dicyclohexylcarbodiimide to get products. The compounds were characterized by spectral data (1H NMR and IR). The solution of the synthesized compounds was added to the test solution containing soybean LOX enzyme, phosphate buffer and linoleic acid. For screening antioxidant capacity, a solution of synthesized compounds were added to absolute ethanol and changes in color were read at 517 nm on UV/VIS double beam spectrophotometer and the percentage of inhibition was determined. (quercetin was used as the standard).

Results:

The synthesized compounds were tested in vitro for their inhibitory properties against the soybean LOX enzyme. The data showed that all the compounds were less active in comparison with quercetin (the reference standard compound) (IC₅₀=5.87 μM). Compounds 5d and 5c exhibited the best inhibitory activity (IC₅₀= 122.39 and 226.77 μM). All the synthesized derivatives have been tested for their antioxidant activity by DPPH assay and their inhibition constant was calculated. All the compounds were found to possess poor antioxidant activity with the IC₅₀ value between 55.15 and 156 μM when compared to the reference standard compound (IC₅₀=7.92 μM).

Conclusion:

The synthesized compounds showed less activity than standard, but these compounds can be used as a base compound for the synthesis in the future.

Keywords:

pyrazole derivatives, Ferulic acid, antioxidant, lipoxygenase, anti-inflammation

References:

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On Water Synthesis Novel Products Passerini Using Mefenamic Acid

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Abstract Presenter:

Zahra Isazadeh

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Hossein Alimadadi

ABSTRACT:

An efficient method for the synthesis of products passerini was developed by using mefenamic acid in excellent yields.

Introduction: Passerini reaction involving an oxo component, an isocyanide, and a nucleophile in a single step to prepare α -acyloxy carboxamide,

The Passerini reaction has developed in organic synthesis, the total synthesis of natural products, synthesis of polycyclics, macrocycles, heterocycles and pharmaceutical industry for the synthesis of drug-like compounds. The Passerini products could be later cyclized by another type of ring-closing reaction.

Experimental: In this method the synthesis of products passerini derivatives has been carried out by the reaction of equimolar amounts of isocyanide, mefenamic acid and aryl aldehyde in the presence of water at 25 oC. the structures of all products were established by spectroscopic methods.

Results and discussion: We report here an efficient method for the synthesis of products passerini by a four-component reaction of equimolar amounts of isocyanide, mefenamic acid and aryl aldehyde in the presence of water. This protocol furnishes the desired products in excellent yields.

Conclusion: The protocol described here produced the desired products passerini in excellent yields and lower reaction times with green solvent.

Keywords:

isocyanide, passerini, mefenamic acid

References:

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Cyclometalated platinum (II) complexes: synthesis, molecular docking and anticancer activity studies

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Abstract Presenter:

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Ayyub Mojaddami

Introduction:

Cisplatin is a powerful chemotherapy drug, but its clinical use is limited due to ototoxicity and renal damage. Significant efforts have been made over the past decades to resolve its side effects. The aim of this study is to discover novel platinum complexes with fewer side effects and better effectiveness on different cancer cell lines.

Methods:

Cyclometalated platinum (II) complexes containing 2-vinyl pyridine were synthesized and characterized using NMR and X-ray spectroscopy, and their anticancer activity was evaluated using MTT method against various cancer cell lines such as lung (A549), breast (MDA-MB-231) and colon (SW1116). The best compound was tested in a comet assay to understand the compound's interaction to the DNA and its apoptosis assay was performed on MDA-MB-231 cells using Annexin-V/PI. Molecular docking study with four different DNA structures (1BNA, 1LU5, 3CO3 and 198D) was carried out using Autodock 4.2.

Results and Discussion:

Among the synthesized compounds, 1C showed the highest cytotoxicity. This compound had IC₅₀ of 23.36, 21.10 and 12.96 μ M respectively on SW1116, A549 and MDA-MB-231, while cisplatin had IC₅₀ of 30.57, 9.75 and 17.50 μ M on the same cell lines. The binding study of 1C to DNA (PDB: 1BNA) showed that this compound was in the DNA minor groove, and interacted with A5, C6, G2 and T5 base pairs. Comet assay showed a strong ability of 1C to interact with DNA. Apoptosis assay on the MDA-MB-231 indicated that it could induce apoptosis in a dose dependent pattern.

Conclusion:

The cytotoxic assay showed that 1C had better effect than cisplatin on three studied cancer cell lines. Molecular docking study and comet assay, showed good interaction between 1C and DNA. Finally, this research supports that 1C should be more studied to explore its potential action to development a new anticancer drug in chemotherapy.

Keywords:

Cycloplatinated Complexes, molecular docking, apoptosis, MTT assay, comet assay

References:

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Synthesis, molecular docking and cytotoxic activity evaluation of 3-bromo pyruvate derivatives as potential anticancer agents

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Abstract Presenter:
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Ayyub Mojaddami

Introduction :

Cancer is a disease that divides body cells abnormally in a malignant tumor. 3-Bromopyruvate (3BP) is an antitumor agent that inhibits hexokinase II (HK2) which is an interesting target for the development of new anticancer drug. The aim of the present study was to synthesis of new 3-BP derivatives and evaluation of their anticancer activity .

Methods:

New analogues of 3-bromopyruvate were designed and virtual libraries consisting of 3-bromo-2-(2-phenylhydrazono) propanoic acid derivatives were created and then subjected to molecular docking using Autodock4.2 on the HK2 enzyme (PDB ID: 2NTZ). Based on drug-likeness and free energy of docking, ten derivatives were selected for synthesis. The synthesized compounds were characterized using spectral techniques (IR, 1H and 13C NMR) and the cytotoxic activity was investigated using MTT assay on three cancerous cell lines including lung (A549), breast (MDA-MB-231) and clone (SW1116) cell lines as well as normal breast cells (MCF-10A) .

Results and Discussion:

3-bromo-2-(2-(4-chlorophenyl) hydrazono) propanoic acid (3b) was the most potent compound with IC50 value of 20.2 μ M, 54.4 μ M, 96 μ M and >200 μ M against A549, MDA-MB231, SW1116, and MCF-10A cells, respectively. Based on the results, the derivatives with bromo atom at 3 position (3b, 3d, 3g and 5a-c) had more cytotoxic activity than other compounds. Furthermore, Substitution on phenyl ring (-R1) enhanced the activity. Except 3d, the activity order of substitutions on phenyl ring (-R1) is 2,4-NO₂ > 3-NO₂ > 4-Cl > H. The energy values for the synthesized compounds were ranged from -4.40 to -7.87 kcal.mol⁻¹, which were greater than 3-bromo pyruvate binding energy (-2.21 kcal.mol⁻¹). This finding showed that 3-bromo pyruvate derivatives had more affinity in binding with HK2 in comparison with 3-bromo pyruvate which fairly agree with biological activity.

Conclusion :

Most of these derivatives had significantly greater antiproliferative activity than 3-bromo pyruvate as the parent anticancer agent. The findings of this study indicate that the new derivatives of 3- bromopyruvate, in particular 3b, have the potential to help in the future treatment of c

Keywords:

hexoinase inhibitors, cytotoxicity, Molecular docking, 3-bromo pyruvate, Anticancer

References:

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Some new Small Molecules as P53 Re-activators, in-silico study

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Abstract Presenter:

Mahboubeh Mardanshahi

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Mahboubeh Mardanshahi

Introduction:

Drug development to more potent and selective agents always has been interested in the field of medicinal chemistry. The p53 transcription factor plays an important role in cell cycle regulation, apoptosis, DNA repair, aging, angiogenesis, cell metabolism, and normal immunity. Wild-type p53 is a very potent tumor suppressor. Overexpression of MDM2 (the murine double minute 2 protein) disrupts tumor suppressor p53 function by binding to it. In this regard, activation of p53 protein function can regenerate the cell apoptosis. Intending to design some novel structures as p53 re-activators, we evaluated the potency of some new scaffolds based on pyrimidine, indole, thiazole and oxadiazole moieties using in-silico studies.

Methods & Results:

Molecular docking was conducted using AUTODOCK 4.2 software. We introduced 12 new hybrid structures, with pyrimidine core and evaluated their interactions with MDM2-P53 active site comparing three different reference structures. The estimated (ΔG_{bind} , kcal/mol) values and the favorable interactions with the key amino acid residues of the active site were in the acceptable ranges (-6.35 to -8.49).

Conclusion:

The purpose of this study was the introduction of some compounds with higher potency. Our structures were potent in terms of estimated binding free energy and favorable interactions with key elements within active sites. Most of the designed compounds exhibited higher binding affinities than three lead compounds ($\Delta G_{bind} = -6.37, -6.75$ and -7.34 kcal/mol). These structures are promising P53 activators for cancer treatment. Among different structures, those with bulky indole and oxadiazole moieties on position 4 of pyrimidine ring have the best binding energy among all. Furthermore, those structures with bulky benzyl groups on nitrogens of pyrimidine ring are the best ones with the lowest IC50 prediction.

Keywords:

p53 Protein, MDM2, Indole-Pyrimidine-oxadiazole

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Preparation of magnetic biological nanohydrogel based on chia seeds and study of its swelling ratio and drug delivery

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5-7 February 2020

Poster 67

Abstract Presenter:

Arezo Kaskani

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Arezo Kaskani

ABSTRACT:

In recent years, hydrophilic plant hydrogels have been received much attention due to their tunable mechanical, chemical and biocompatibility properties. Hydrogels obtained from plants are naturally three-dimensional crosslinking polymers that capable of absorbing a large amounts of water without dissolving as colloidal gels in which water molecules are dispersion factor. The absorption of water in hydrogels is due to the presence of hydrophilic functional groups. Hydrogels, due to their hydrated environment and adjustable properties similar to the native extracellular matrix, can be used in a wide variety of biomedical engineering applications such as targeted drug delivery systems. The unique properties of the hydrogels can be achieved by incorporating different magnetic micro and nanoparticles including γ -Fe₂O₃, Fe₃O₄, CoFe₂O₄, CuFe₂O₄ and NiFe₂O₄ in the hydrogel matrix. This study is described the preparation of a new magnetic nanohydrogel by the crosslinking and copolymerization of vinyl modified chia seeds gum using vinilic monomer and a vinilic cross-liker in the presence of modified Fe₃O₄@SiO₂ nanoparticles by vinyl groups (Fe₃O₄@SiO₂@VTMOS). Furthermore, to investigate the potential of the newly designed pH sensitive hydrogel as an appropriate matrix for use in drug delivery systems, its drug loading and release behaviors were identified using naproxen as a model drug. Also the water uptake of magnetic hydrogel was calculated

Keywords:

Chia Seeds gel, Hydrogels, Nanohydrogel, Drug Delivery, Naproxen

References:

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Solubility of caffeine in N-methyl-2-pyrrolidone and ethanol mixture at different temperatures

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5-7 February 2020

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Abstract Presenter:

Homa Rezaei

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Elaheh Rahimpour

ABSTRACT:

The solubility profile of caffeine in the binary non-aqueous mixtures of N-methyl-2-pyrrolidone (NMP) and ethanol at different temperatures is determined and the obtained data are fitted to some linear and non-linear cosolvency models including the van't Hoff, the double log-log, the mixture response surface, Yalkowsky, Jouyban-Acree, Jouyban-Acree-van't Hoff, and the modified Wilson models. The measured density data of caffeine saturated solutions as another physico-chemical property are also correlated with the Jouyban-Acree model and the results are discussed. In order to investigate the accuracy of the applied models, the mean relative deviations (MRD%) of the back-calculated solubility data is calculated. Furthermore, the apparent thermodynamic properties of caffeine dissolution process are also calculated by using van't Hoff and Gibbs equations.

Keywords:

Cosolvency models, Binary solvent mixtures, Solubility, Caffeine, Ethanol

References:

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Some novel pyridone-indoles derivatives as possible LDH inhibitors

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Abstract Presenter:

Niloofer Naghi Ganji

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Niloofer Naghi Ganji

Introduction:

According to the WHO, malaria has cases 881,000 deaths worldwide in 2015. Design and development of molecules which can target a mechanism in the life cycle of parasite has ever been as interesting field. One of the targets in this field is the enzyme of plasmodium falciparum lactate dehydrogenase (pfLDH). The pfLDH enzyme has an important role in living cycle of parasite. The pfLDH inhibitors are expected to have higher therapeutic index. Some of previously reported molecules with quinolone motif and primary mechanism of the inhibition of polymerization of hemozoin showed still pfLDH enzyme inhibition activity. In this study, we designed and developed some new hybrid pyridone-indole structures to activate both of pfLDH enzyme and polymerization of hemozoin inhibition mechanistic routes.

Methods and Result:

Molecular docking was conducted using AUTODOCK 4.2 software. We synthesized hydroxy pyridine derivatives using kojic acid and indole derivatives from indole and finally reacted both subunits to get an imine bond.

Conclusions:

The results of docking study including the estimated (ΔG_{bind} , kcal/mol) values, and the favorable interactions with the key amino acid residues of the active site were in the acceptable ranges (-6.94 to -10.46). Based on docking models, four of our candidates exhibited higher binding affinities than NADH (the main ligand of enzyme, ΔG_{bind} : -8.81) to the LDH active site. These findings show promising outlook for the development of novel pfLDH inhibitors. All of chemical structures were approved by the IR and NMR spectra and the initial in-vitro activity test is ongoing now.

Keywords:

Malaria, pfLDH, Pyridone-Indole, Molecular docking

References:

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Medication adherence and its explanatory factors in elderly patients

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5-7 February 2020

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Abstract Presenter:

Faezeh Faramarzi

*** Correspondance:**

Faezeh Faramarzi

Introduction:

Population aging around the world is increasing dramatically, and as people age, they are more likely to experience comorbidities leading to polypharmacy at the same time. These may also affect their medication adherence as a crucial component in the treatment of chronic diseases. The current study was designed to determine medication adherence of elderly patients and its possible explanatory factors.

Methods:

An observational, descriptive and analytical cross-sectional study was designed. Elderly patients (≥ 60 years), who had at least one chronic health condition, and were referring to the Shahid Kazemi Educational Pharmacy, Tehran, Iran, were recruited into this study from October 2019 to December 2019. Patient data were recorded in a data gathering form consisting of 3 main sections of sociodemographic, medical and medication history, and a validated Persian version of the Simplified Medication Adherence Questionnaire (SMAQ). Sample size was determined using the Krejcie and Morgan table. SPSS, version 22.0, was used for data analysis.

Results:

Overall, 200 patients including 98 (49.00%) females and 102 (51.00%) males with mean \pm sd age of 67.00 \pm 5.00 years entered into the study. One hundred seventy-five (87.50%) patients were non-adherent. In the final multivariable linear logistic regression model, only 2 variables of “the number of medications” ($p=0.01$) and “experiencing an ADR (Adverse Drug Reaction) leading to medication discontinuation” ($p=0.04$) have remained as predictors of medication adherence.

Conclusion:

Our findings showed a considerably high rate of non-adherence (87.50%) in elderly patients. Particular attention should be paid to patients with a higher number of concurrent drug use as well as those who have previous history of serious ADRs leading to drug discontinuation. It is recommended that these patients and their caregivers be provided with interventional and educational programs to improve their medication adherence.

Keywords:

Medication adherence, Elderly, SMAQ, Compliance

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Mupirocin mucoadhesive formulation for intranasal delivery

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Abstract Presenter:

Aref Javidnia

* **Correspondance:**

Saba Ghaffary

Introduction:

Nasal mucosa has been considered as a potential ad-ministration route to achieve faster and higher levels of drug absorption and Nasal drops are one of the most simple and convenient systems developed for nasal delivery.¹ Mupirocin is a naturally occurring antibiotic produced by submerged fermentation of *Pseudomonas fluorescens*. It inhibits bacterial protein synthesis by binding reversibly and specifically to isoleucyl-tRNA synthetase.² Organisms resistant to other antimicrobials are not simultaneously resistant to mupirocin.² Patients with nasal carriage of *Staphylococcus aureus* have an increased risk of surgical site infections caused by that organism. Treatment with mupirocin nasal drop can reduce the rate of nasal carriage and may prevent postoperative *S. aureus* infections.³

Methods:

Mupirocin is slightly soluble in aqueous medium and its solubility can be increased using solubilizing agents.⁴ In this study HPMC + water solvent system was used to enhance solubility and reduce irritating effects of mupirocin. Mupirocin was dissolved in appropriate solvent (water) and surfactant (HPMC) mixtures with heating in a water bath of 60 °C and vigorous vortexing.

Results:

The cosolvent formulation (composed of water and HPMC) showed a significantly higher drug concentration when HPMC was present. In addition the property of irritating was decreased.

Discussion and Conclusion:

In this study the nasal drop of mupirocin was formulated at water + HPMC mixture that caused increase in solubility of mupirocin in water and increase irritating and this formulation was effective enough to reduce the rate of nasal infections.

Keywords:

Mupirocin, Nasal drop, formulation

References:

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Study of the efficacy of coadministration of pioglitazone and vitamin E compared to metformin and ursodeoxycholic acid (UDCA) on ultrasound scoring and liver enzymes in patients with non-alcoholic fatty liver

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5-7 February 2020

Poster 72

Abstract Presenter:

Niloufar Soleimani

* **Correspondance:**

Elnaz Shaseb

Introduction:

Non-alcoholic fatty liver disease is one of the main causes of liver disease worldwide. a treatment for that is still a major challenge. Insulin resistance and oxidative stress play a key role in the pathogenesis of this disease .

Methods:

This study is a RCT. 185 patients were randomly selected and divided into two groups of intervention. The study population was aged between 18 and 65 years old with diagnosed non-alcoholic fatty liver and non-diabetic. One group of patients receives Pioglitazone 15mg and Vitamin E800IU and the other group receives Metformin 500mg and UDCA 300mg (TID) and is monitored for liver ultrasound and liver enzymes, pregnant and lactating women and alcohol users have been excluded from the study .

Results:

Changes in the level of liver grade and AST and ALT enzymes were significant between two groups. Intra-group studies showed a significant decrease in fatty liver grade and liver enzymes levels in the pioglitazone and Vit E groups as opposed to the metformin and UDCA groups. There was also a significant difference in the HDL, FBS and BMI parameters in the pioglitazone group. Significant decrease in body weight (P = 0.025) and decrease in total cholesterol (P = 0.05) were also among the therapeutic effects of metformin and UDCA.

Conclusion:

Concomitant administration of pioglitazone and vitamin E is both more effective in reducing fatty liver ultrasound and improving liver enzymes than concomitant administration of metformin and UDCA.

Keywords:

Non-alcoholic fatty liver disease, pioglitazone, ursodeoxycholic acid (UDCA), metformin

References:

Boettcher E, Csako G, Pucino F, Wesley R, Loomba R. Meta-analysis: pioglitazone improves liver histology and fibrosis in patients with non-alcoholic steatohepatitis. *Alimentary pharmacology & therapeutics*. 2012;35(1):66-75.

Foster T, Budoff MJ, Saab S, Ahmadi N, Gordon C, Guerci AD. Atorvastatin and antioxidants for the treatment of nonalcoholic fatty liver disease: The St Francis Heart Study randomized clinical trial. *The American journal of gastroenterology*. 2011;106(1):71.

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Evaluation of Allopurinol Effects on Plasma Level of Cardiac Troponin I and MB Creatine Kinase Enzyme in Patients with Acute Ischemic Heart Disease (NSTEMI)

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Abstract Presenter:

Elham Mohamadrezapour

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Taher Entezari maleki

ABSTRACT:

Ischemic heart disease is an increasingly important health and economic issue. The prevalence of the disease in human societies is increasing. Studies have shown that increased cardiac biomarkers following acute cardiac ischemia with mortality in patients are related.

Cardioprotection against increased biomarkers is one of the important goals. According to the potential effects of allopurinol on improving ischemic effect on cardiac muscle, the above study was performed.

Allopurinol is a Xanthine Oxidase inhibitor drug that is synthesized from urea. It prevents xanthine and hypoxanthine. In the emergence of CAD pathophysiology, oxidative vascular stress is a basis and Allopurinol has improved in this stress and vascular function in patients with a history of CAD.

So recently research on allopurinol in the treatment of cardiac ischemia. It was done that the early results were promising.

This study was a prospective, randomized, pilot and unilateral clinical trial. The study population was ACS patients whose heart ECG was NSTEMI.

The study population was 100 people. Patients were randomly divided into control and subgroups. Allopurinol treatments were divided.

The first group received only routine treatment and the second group received allopurinol 600 mg in two divided doses for 5 days.

Blood levels of troponin I were measured by ELISA every 8 hours for 5 times.

Results: It seems there was a significant difference in the level of troponin I between the intervention and control groups.

In a similar study performed on patients whose heart ECG was STEMI, no significant difference was found between the control and sample groups. 8 h (P = 0.141), 16 h (P = 0.256), 24 h (P = 0.532), 32 h (P = 0.865).

Keywords:

CAD, NSTEMI, CTnI, Allopurinol, oxidative vascular stress

References:

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Attitude and Knowledge of Community Pharmacist Toward Herbal Medicines

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Abstract Presenter:

Asal Najafi

*** Correspondance:**

Asal Najafi

Introduction:

A growing increase in natural products and herbal medicines consumption has been observed these days all over the world, so pharmacists must be knowledgeable about these medicines safety, in addition to the ideal position pharmacists have for educating patients about herbal medicines. This study was intended to determine the pharmacists' information regarding herbal medications.

Methods:

We systematically searched MEDLINE, Google Scholar, Scopus and Science Direct from 1995 to December 2019. Systematic reviews of all study designs and outcomes were considered using MeSH terms that include ("Pharmacy" or "Pharmacist" or "clinical Pharmacist") and "herbal medicines" and other possible combinations.

Results:

The pharmacist's role in selling dietary supplements, including herbal products, was investigated by a former Food and Drug Administration (FDA) commissioner. Because of pharmacists' knowledge about pharmaceuticals, medicinal chemistry, they are in the best position to inform and ensure appropriate use of these products.

Conclusion:

Counseling, as an empathetic interaction, should improve the patient's knowledge promote regimen adherence. A patient who uses herbals must understand that the products may not be proven efficacious and may have unwanted effects. Pharmacists should provide information to minimize patient harm.

Keywords:

community Pharmacist, Herbal remedy, Pharmacist, Complementary medication

References:

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Randomized, placebo-controlled, double-blind study of oral lithium to prevent chemotherapy induced peripheral neuropathy in breast cancer patients under treatment by taxanes and platinum based medicines

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Abstract Presenter:

Zahra Heidarali

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Zahra Heidarali

Introduction:

Chemotherapy induced peripheral neuropathy is a common side effect of some of chemotherapy medicines such as taxanes, vinca alkaloids and platinum agents. Most CIPN are sensory. Tingling or numbness in the feet or fingers is often an early sign. Several drugs such as glutathione, acetyl-L-carnitin, vitamin E, intravenous calcium and magnesium... have been used for the prevention of CIPN but none of them has considerable effects. Animal studies have suggested that lithium may be effective for the prevention of CIPN . Purpose: Determination of lithium effectiveness for the prevention of CIPN in breast cancer women under treatment by taxanes and platinum based medicines .

Methods:

A randomized, double-blind, placebo-controlled study was conducted in breast cancer women under chemotherapy. In this study patients were divided into to groups randomly: placebo and drug. One day before every chemotherapy cycle, placebo group was receiving placebo tablet up to 4 days later (totally 5 days) each day one tablet and drug group was receiving 300 mg lithium tablets up to 4 days later (totally 5 days) each day one tablet. Before starting chemotherapy, 3 months after starting chemotherapy and 9 months after starting chemotherapy, EMG-NCV were taken from the patients, also in these time sections, signs and symptoms of numbness, tingling, freezing, sensitivity to touch and muscle weakness were assessed from all patients .

Results:

All numeric and nominal variables were compared and assessed between 2 groups of placebo and drug. The results showed that for all variables P value > 0.05 that means there is no significant difference between two groups. Also changes of each variable in each group were assessed. For all numeric variables P value 0.001 which means changes in numeric variables in each group were significant.

Conclusion:

The results of this study showed that using 300 milligrams of lithium for 5 days each chemotherapy cycle, didn't appear to prevent CIPN in the studied of patients receiving neurotoxic chemotherapy.

Keywords:

Chemotherapy, prevention, peripheral neuropathy, lithium

References:

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Evaluation of frequency and type of medication errors in hospital NICUs in Tehran

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Abstract Presenter:

Fatemeh Izadpanah

*** Correspondance:**

Fatemeh Izadpanah

Introduction:

Medication errors are one of the most common medical errors and these errors have a double importance in neonatal intensive care unit .

The aim of this study was to determine the frequency and type of medication prescribing errors in neonatal intensive care unit.

Methods:

This study is a descriptive-analytical research. A census sample of 86 nurses from the neonatal intensive care unit of 6 hospitals in Tehran was included in study in 2018. The tools of data were collected by means of a questionnaire including demographic, occupational and “medication errors” parts. Data were analyzed by descriptive statistics and the Chi-square statistical test, using SPSS software v.18 .

Results:

61.9% of nurses (34 persons) had made medication errors. 45.3% of samples had made 1-2 errors, and 63% of errors had occurred on the night shift. The most frequent parenteral medication errors were errors in drug calculation, errors in the drug infusion rate, drug dosage, , drug dosage, and the Lack of attention to drug-drug interactions. the drug route of administration, and incorrect medication. In nonparenteral medications, drug calculation, wrong route of administration, wrong drug, wrong dosage were frequently reported. Nurses declared that the large number of patients, lack of update pharmacologic knowledge, lack of time and attention, were the main causes of errors.

Conclusion:

The high frequency of medication prescribing errors particularly in parenterals, considering to education program, coordinating with pharmacists and improvement of nurse-to-patient ratio are effective in reduction of medication errors. future research is needed to further evaluate the causes and prevention strategies of the medication error.

Keywords:

Medication errors, hospital, neonates, Intensive care unit, patient safety

References:

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Mrayyan MT, Shishani K, Al-Faouri I. Rate, causes and reporting of medication errors in Jordan: nurses' perspectives. J Nurs Manag. 2007 Sep; 15(6): 659-70.

Evaluation of Hospital Accreditation on Hospital Pharmacies Performance

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5-7 February 2020

Poster 77

Abstract Presenter:

Fatemeh Izadpanah

*** Correspondance:**

Fatemeh Izadpanah

Intorduction:

According to the role of hospital pharmacies in providing high-quality services and ensuring the effectiveness of patient care, it is necessary for hospitals to use the right tools such as "accreditation standards" to evaluate the current activities of pharmacies and the challenges of hospital pharmacy management.

This study was design to determine the effectiveness of hospital accreditation on improvement of medication management in hospital pharmacies.

Methods:

This study is a cross sectional-descriptive research in pharmaceutical care units of 6 hospitals in Tehran. data collection tool was Third version of hospital accreditation standard of ministry of health and medical education and 5 functional determinants were evaluated including: Destruction of expired and recalled medicines and medical equipment in accordance with regulations, Perform medication error management in accordance with a specific administrative procedure, Developing and implementing the "Safe Drug Storage" guidelines, Availability of medications required by pharmacopoeia in drug and therapeutic committee, Medication-use evaluation of prescribed medications with given highest priority to usage of antibiotics.

Data were analyzed by descriptive and perceptive statistics, using SPSS software v.22.

Results:

The mean score of hospital pharmacies was 48.5% in 2013 and 75.4% in 2015. The mean differences were expressive between two accreditation processes. relationship between accreditation standards observation and functional determinants of pharmaceutical care unit were significant. (p0.05)

Conclusion:

observing of hospital accreditation standards cause to promote functional determinants of pharmaceutical care unit and patient safety and effective pharmacotherapy. Thus revising policies and making available basic elements could cause improve therapeutic conditions.

Keywords:

Accreditation, hospital pharmacy, pharmaceutical care, standard, functional determinant

References:

Fortes MT, Mattos RA, Baptista TW. Accreditation or accreditations? A comparative study about accreditation in France, United Kingdom and Cataluña. *Rev Assoc Med Bras.* 2011;57:239-46.

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Ashna Delkhosh R, Ardama A, Salamzadeh J. Decentralization and hospital pharmacy services: The case of Iranian university affiliated hospitals. *Iran J Pharm Res.* 2013;12(Suppl):183-8.

The efficacy of 1% colloidal oatmeal cream as adjunct therapy in the management of chronic irritant hand eczema: a double-blind study

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5-7 February 2020

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Abstract Presenter:

Mahsa Hojati

*** Correspondance:**

Maryam Mehrpooya

Introduction:

Irritant contact dermatitis is the most frequent cause of hand eczema (HE) which is a localized inflammatory skin response to many chemical or physical agents. Colloidal oatmeal is a natural product that its beneficial effect in treatment of different dermatologic disorders has been shown previously. The objective of this study was to evaluate the clinical benefit of colloidal oatmeal cream as an adjunctive-therapy in management of chronic irritant HE.

Methods:

A double-blind, 6-week control trial was conducted from May2018 to August2018 in an outpatient dermatology clinic affiliated to Hamadan University of Medical Sciences, Hamadan, Iran. 63 patients who met the study criteria were allocated into either control group (flucinolone 0.025% ointment + colloidal oatmeal 1% cream) or intervention group (flucinolone 0.025% ointment + vehicle cream) by block randomization method. Besides flucinolone 0.025% ointment twice daily for 2-weeks, patients in intervention and control groups were asked to use colloidal oatmeal 1% cream or vehicle cream four times daily for 6 weeks. Change in clinical severity of HE based on the hand eczema severity index (HESCI) score, severity of itching based on the Visual analog scale (VAS) at week 2, 4 and 6 and impact of skin disorder on patients' quality of life at baseline and the end of the study period were assessed in the study groups.

Results:

50 subjects including 26 and 24 individuals in the intervention and control groups, respectively, completed the 6-week course of the study. Our results showed while mean scores of HESCI and intensity of itching decreased over time in both groups, the improvement of symptoms was superior in intervention group than control group (p value0.001 in both conditions). In addition, treatment with colloidal oatmeal application as adjunct-therapy was more effective in improving patients' quality of life (p value0.001). In addition, colloidal oatmeal cream was well tolerated in almost all patients.

Conclusions:

Our findings indicate that colloidal oatmeal, an anti-inflammatory and moisturizing product, can have ameliorative effects on eczema severity symptoms in chronic HE patients.

Keywords:

Hand eczema, irritant contact dermatitis, colloidal oatmeal, hand eczema severity index, dermatology life quality index (DLQI)

References:

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Study of the possible explanatory factors related to the supplementary iron intake in pregnant women

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5-7 February 2020

Poster 79

Abstract Presenter:

Samaneh Beigom
Mirbehbahani

* **Correspondance:**

Jamshid Salamzadeh

Introduction:

During pregnancy, iron supplement has normally been recommended in daily dosage of nearly double the amount of iron needed by non-pregnant women. Few studies have showed that usage of supplements is dependent on demographic, sociologic, and economic factors. This study was designed to evaluate the iron supplements (IS) intake and possible factors affecting its usage by pregnant women in two cities of Iran, i.e. Tehran and Gorgan.

Methods:

This study is a qualitative and quantitative study of IS utilization by pregnant women. A descriptive and analytical cross-sectional study was designed in which pregnant women referring to the university affiliated health care centers in Tehran and Gorgan were studied during April to November 2019. A data gathering form consisting of three main sections of sociodemographic, medical history and medication history of pregnant women was designed. History of supplemental iron was also recorded. Daily intake of 30 mg of elemental iron considered as "Recommended Dietary Allowances" (RDA) based on the national maternity care program. Data entered into the SPSS (version. 22.0), and evaluated descriptively as well as analytically applying proper statistical tests.

Results:

Overall 400 pregnant women with mean±sd age of 28.27±5.11 years entered into this study. Distribution of different ethnicity groups were Fars (55.50%), Non-Fars (36.00%) and Afghan (8.50%). The average gestational age was 25.85±8.35 weeks. Mean±sd amount of supplemental intake by pregnant women was 60.15±35.40 mg/day. Only, 16.25% of the participants were taking supplemental iron as RDA, and 77.75% and 6% of pregnant women were using supplemental iron in doses higher and lower than the RDA, respectively. IS were being used more appropriately in Gorgan compared to Tehran (p=0.003). Multivariate logistic regression analysis revealed that pregnant women with a higher weight (p=0.001) and those under supervision of obstetricians (p=0.006) (compared to those under supervision of midwives and GPs) were taking IS higher than the RDA. In addition, a negative association between incidence of anemia and higher amount of IS usage was observed (p=0.03). Also, self-report of general health score (from 0 to 10) was higher in women taking higher amounts of supplemental iron.

Conclusion:

Our findings revealed that a major proportion of the pregnant women are taking supplemental iron in values above the RDA. Since, the intake of (high-dosed) iron supplements in pregnant women, in particular in women with elevated iron stores may be associated with adverse effects such as low birth weight, preterm birth and an increased risk of gestational diabetes (1), therefore, careful educational programs are needed to be implemented to encourage more rational and documented use of supplements containing iron during pregnancy. In addition, unnecessary overuse of iron can waste limited health care resources allocated for the national maternity care programs.

Keywords:

Pregnancy, Iron, Supplements

References:

Demuth, I.R., Martin, A. & Weissenborn, A. Iron supplementation during pregnancy – a cross-sectional study undertaken in four German states. *BMC Pregnancy Childbirth* 18, 491 (2018) doi:10.1186/s12884-018-2130-5.

A case of Nicolau syndrome when Penicillin and Betamethasone were injected simultaneously and a brief review of all English cases of PubMed.

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5-7 February 2020

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Abstract Presenter:

Paria Mojarrad

*** Correspondance:**

Paria Mojarrad

Background:

A 33- year-old woman experienced burning and paresthesia after IM injection of penicillin while there was no problem with the first penicillin injection and a simultaneous betamethasone. On the following days it turns into a livedoid patch with blisters at the injection site.

Nicolau syndrome (NS) is a rare iatrogenic syndrome that mostly appears with local signs at the injection site. It has been seen mostly with IM injection by some medicines like penicillin, NSAIDs and corticosteroids. Severe pain, paleness and livedoid at the injection site are common signs that usually turn into erythematous and necrotic patch. The exact pathology of Nicolau syndrome has not been found.

Case history:

The patient had no history of a chronic disease or taking medicines and although she had had penicillin injection before but she had no experience of NS.

Investigation:

Her immediate sings were severe pain and paresthesia of the lower limb that gradually change into a livedoid patch, blisters and necrosis. Blood test, MRI, ultra-sonography and vital signs were normal .

Treatment/results:

She received palliative therapy for first days. Oral cephalexin for the infectious ulcer and debridement of the necrotic tissue were other interventions. After several debridement cefazolin and methadone were prescribed. All the complications resolved within 41 days.

Discussion/differential diagnosis:

Proper injection site and a suitable injection method can partly prevent NS. Early diagnosis and intelligent treatments could stop the syndrome at early stages .

There are no official criteria for NS diagnosis, so it is based on the history of previous injection and symptoms.

Some important differential diagnosis includes local toxic reaction to drugs, vasculitis and fat embolism .

With the complete review of all the PubMed cases, we studied the relationship between many different factors like age, site of injection and medicine with the rate of Nicolau syndrome.

Keywords:

Nicolau syndrome, Penicillin, Intramuscular injection, Betamethasone, review

References:

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Comparison of omega 3 level in olive and walnut oil produced in various cultivars

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5-7 February 2020

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Abstract Presenter:

Sayed Behnam Farmanara

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Mahdi Ansari Dogaheh

Introduction:

Olive and walnut have a high amount of omega 3 fatty acids that can elevate useful lipoproteins (HDL) in the blood and lower the risk of cardiovascular diseases. Walnut is a rich source of alpha-linolenic acid. Gas chromatography (GC) is the commonly used method of analyzing Gas chromatography (GC) is the commonly used method of analyzing alpha-linolenic acid as a representative of omega 3 fatty acid.

Methods:

Standard samples of fatty acids including methyl palmitate, methyl oleate, methyl linoleate, methyl linolenate and methyl stearate were analyzed by GC FID. The validated method was used for determination of fatty acids in walnut and olive samples gathered from various parts of Iran. Methylic esters of fatty acids retention times were used to determine the type of fatty acids present in the samples and the concentrations were measured by comparing the area under the curve (AUC) of the chromatograms in the test samples to the AUC of the reference chromatograms according to the calibration curve constructed for each fatty acid. Indices like iodine. acidity and refractive index were also measured .

Results:

In the 21 samples of walnut and olive collected from various geographical parts of Iran, the highest content of palmitate and oleate was found in two olive samples taken from Roudbar in Gilan and the lowest content of palmitate and oleate was found in the four walnut samples taken from Rabor in Kerman. The lowest amount of stearate was found in the walnut from the Rabor The highest amount of linoleate and linolenate were found in the sample 1of walnut from Rabor and the lowest amount in the olive from Roudbar

Keywords:

Omega3, Olive oil, Walnut oil, Gas chromatography, Method Devempent

References:

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Investigation of antibacterial property of silver nanoparticles on Multi Drug Resistant (MDR) *Acinetobacter baumannii* strains isolated from ICU hospitalized patients

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Abstract Presenter:

Davar Mohammadpour

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Davar Mohammadpour

Introduction:

The bacteria isolated from ICU wards are mainly resistant to major classes of antibiotics and increase morbidity and mortality rates. *Acinetobacter baumannii* is particularly related to hospital-acquired infections especially ventilator-associated pneumonia (VAP) in hospital ICU wards .

The treatment of *Acinetobacter baumannii* infections are usually very difficult due to their widespread resistance to the main classes of antibiotics. one of the advantages of silver nanoparticles is that the bacteria will not be resistant against silver nanoparticles and these particles will influence the wide range of bacteria. In the present study, we intend to investigate the antibacterial property of silver nanoparticles on Multi-Drug Resistant (MDR) *Acinetobacter baumannii* isolated from ICU hospitalized patients in Imam Hossein hospital, Tehran, Iran.

Methods:

35 hospitalized patients from all ICU wards of Imam Hossein hospital were isolated as a sample *Acinetobacter baumannii* strains were isolated using biochemical tests. Then susceptibility test was conducted by the disk diffusion method for all *Acinetobacter baumannii* strains and the resistant strains were isolated from them .

The effect of silver nanoparticles on isolated bacteria was investigated using zone of inhibition survey method, MIC and MBC.

Results:

Inhibition zone diameter was observed in all resistant *Acinetobacter baumannii* strains in 250 µg/ml concentrations. MIC of silver nanoparticles was reported in all resistant strains equal to 15.6 µg/ml .

Cocclusion:

Increasing multiple resistance between pathogenic bacteria has been a global concern. Thus finding a new alternative for antibiotics that has antibacterial property is very important. these alternatives in lower concentrations would prevent bacteria from growing and have lower side effects.

Keywords:

Acinetobacter baumannii, Multidrug Resistant, silver nanoparticles, ICU

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preparation of a dry inhaler system (DPI) containing solid nanoparticles (SLN) for pulmonary delivery of Amphotericin B

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5-7 February 2020

Poster 83

Abstract Presenter:

Pegah Changavi

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Reza Mahjub

ABSTRACT:

The aim of this study was to prepare dry powder inhalers (DPIs) containing amphotericin B-loaded solid lipid nanoparticles (AMB-SLNs) as an alternative approach for prevention of pulmonary aspergillosis. For solubilizing AMB in small amounts of organic solvents ion paired complexes were firstly formed by establishing electrostatic interaction between AMB and distearoyl phosphatidylglycerol (DSPG). The SLN formulations containing AMB-DSPG complexes were prepared using glycerol monostearate (GMS) as the lipid matrix and soybean lecithin and tween 80 as the surfactants by solvent emulsification-evaporation technique. The nanoparticles were optimized through a fractional factorial design. DPIs were prepared by lyophilization technique using lactose as the inhalational carrier and then after, the formulations were evaluated in terms of aerodynamic particle size distribution using an Andersen cascade impactor. The morphology of the particles was examined using scanning electron microscopy (SEM) and in vitro drug release profiles were evaluated. Following the statistical results, the particle size, Poly dispersity index (PdI), zeta potential, entrapment efficiency (EE%) and drug loading (DL%) of the optimized SLNs were $187.04 \pm 11.97 \text{ nm}$, 0.188 ± 0.028 , $-30.16 \pm 1.6 \text{ mV}$, $89.3 \pm 3.47\%$ and $2.76 \pm 0.32\%$, respectively. Formulation containing 10% w/v of lactose with the calculated fine particle fraction value as $72.57 \pm 4.33\%$ exhibited the appropriate aerodynamic characteristics for pulmonary drug delivery. SEM images revealed de-agglomerated particles. In vitro release studies showed sustained release of AMB from the carriers and the release kinetics were best fitted to the first-order kinetic model.

Keywords:

Amphotericin B, Ion paired complexation, Distearoylphosphatidylglycerol (DSPG), Solid lipid nanoparticle (SLN), Dry powder inhaler (DPI)

References:

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Formulation and Physicochemical Evaluation of Ondansetron Oral Thin Film

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Poster 84

Abstract Presenter:

Faeze Ebrahimi

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Mehdi Ansari

Introduction:

Ondansetron was synthesized in 1983 as the hydrochloride dihydrate salt. Ondansetron is a highly selective 5-HT₃receptor antagonist which shows antiemetic activity and is indicated as first-line therapy in cancer patients for the management of nausea and vomiting caused by chemotherapy and radiation therapy, as well as to prevent postoperative nausea and vomiting in both adults and children. Many pharmaceutical companies are switching their products from tablets to fast dissolving oral thin films. Oral Thin Film (OTF) is a newly emerging drug delivery system which has many benefits for patients. Drug delivery system of oral thin film of ondansetron solves many problems arising from prescribing oral medication. The absolute bioavailability of ondansetron after oral administration is reported to be 60% which is attributed to first pass metabolism, therefore it is a good candidate for oral thin film. The aim of this research is to present and investigate physicochemical characteristics of a suitable formulation of oral thin film of ondansetron.

Methods:

HPMC, carbomer, PEG, sweetener, flavor and citrate were dissolved in water and thin films were prepared by solvent casting method. A simple UV spectrophotometric method was developed for the determination of ondansetron in content uniformity, dissolution and stability studies. Physicochemical properties such as fragility, pH, content uniformity, dissolution, and stability of the drug in the formulation were measured .

Results:

Results showed that thin films with thickness of around 0.02 mm, were flexible, uniform, isolatable, surface pH of 6, with acceptable organoleptic properties. Stability test experiment period showed acceptable stability of more than 90% at 40oC over a period of 6 months which indicates that it can have at least shelf life of 2 years. Ondansetron transparent polymeric thin films were dissolved in less than 5 minutes.

Conclusion:

Oral thin films of ondansetron with suitable pharmaceutical properties and fast dissolution may increase the bioavailability and shorten its onset of action.

Keywords:

Ondansetron, Oral thin film, Dissolution Stability, formulation

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Khadra, I., et al., Characterisation and optimisation of diclofenac sodium orodispersible thin film formulation. International Journal of Pharmaceutics, 2019. 561: p. 43-46.

Evaluation of physicochemical characteristic of commercialized metformin tablets in Iran

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5-7 February 2020

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Abstract Presenter:

Haniyeh Jafari

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Arash Mahboubi

Introduction:

Given the wide variety of uses of metformin, especially in diabetes, which has been one of the most common diseases of the last few decades, as well as the high rate of sales of this medicine and the variety of its brands at different prices that induce consumption between different brands; This study was conducted to compare the physicochemical properties of several commonly used brands in the Iranian market based on USP pharmacopeia.

Methods:

In this study, we performed the tests of friability, hardness, dissolution, and assay among the tests listed in the USP. To test the friability, we weighed 13 tablets and inserted them into the erosive device. We adjusted the device settings to 25 rpm for 4 minutes and weighed 16 tablets once the machine was finished. We also tested the hardness using a hardness tester for 10 tablets and calculated their hardness individually. For assay testing, a solution of metformin tablets with a concentration of 10 µg / ml in distilled water was prepared and its content was read by UV at 232 nm and compared with standard solution concentration. The dissolution test was performed in accordance with the test of a metformin monograph listed in the USP. Six tablets were placed in the dissolution device with the medium of phosphate buffer pH = 6.8 and apparatus 1 in the basket at a speed of 100 rpm, and their concentration was read by UV at 5, 15, 30, 45 and 60 min.

Results:

All tablets passed the test of friability and hardness. In the Assay test, two companies (Company A and H) failed to reach the previous range, which was 95% to 105%. The assay results were 109% for company A and 86% for company H. In the dissolution Test of 6 companies, all 6 tested tablets were able to pass the required amount stated in the USP, which was at least 75% within 45 minutes. But the three companies C, G and H had 5 tablets, 2 tablets and 3 tablets out of range respectively, which were tested to make sure the three companies had 6 tablets, but again all the tablets failed the test.

Conclusion :

According to the results, A, C, G, H are not good choices and cannot be replaced by other companies.

Keywords:

Metformin, usp, physicochemical, diabet, pharmacopeia.

References:

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Design, preparation and characterization of bile salt-based niosomes for oral delivery of tamoxifen citrate

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Abstract Presenter:

Siamak Pakdaman

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Marjan Daeihamed

Introduction:

The oral bioavailability of tamoxifen, as drug of choice for treatment of breast cancer, is decreased by first-pass metabolism, p-glycoprotein-mediated efflux and poor solubility. Lipid-based nanoparticles including niosomes exhibit proper efficacies in increasing oral bioavailability of poorly soluble drugs. Furthermore, bile-salts are natural body components which can be an alternative for surfactants and studies have shown their significant efficacy in oral drug delivery. In this study, bile salt-based niosomes (bilosomes) were designed and evaluated in vitro for oral delivery of tamoxifen.

Methods:

Various tamoxifen-loaded niosomes and bilosomes consisting of tween 20, 60 or 80, span 60 or 80 and cholesterol were prepared by thin-film hydration method. Sodium taurocholate was used for preparation of bilosomes. The effects of different factors like bilayer composition, cholesterol content, lipid to drug ratio were investigated. Physicochemical characteristics including particle size, zeta potential, and encapsulation efficacy (EE) were evaluated and release experiments were conducted in simulated gastric and intestinal fluids (SGF and SIF).

Results and Discussion:

The results showed that addition of bile salts to niosome structure enhanced EE of formulations, reduced particle size and shifted zeta potentials to more negative values. Highest EE was seen for Tween 60: Sodium taurocholate: Cholesterol (1:1:1) formulation is about 84%. The particle size was in the range of 123 to 130 nm for niosomal formulations while smaller particle size was achieved for corresponding bilosomes (between 103 to 88 nm). Zeta potential values were between -0.42 and -33.73. In vitro release studies confirmed proper release and dissolution of bilosomes in GI tract.

Conclusion:

Bile salt-based niosomes consisting of Sodium taurocholate, tween 60(or span 60) and cholesterol with desired physicochemical properties and release behavior in SGF and SIF were prepared and characterized successfully.

Keywords:

Tamoxifen, Bilosome, Nanoparticle, Bile salt, Oral drug delivery

References:

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Preparation of molecular imprinting soft contact lens for dorzolamide using computational method and experimental design

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5-7 February 2020

Poster 87

Abstract Presenter:

Shahryar Moradi

*** Correspondance:**

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Introduction:

Glaucoma is an eye disease, which is characterized by progressive optic neuropathy due to an increase in intraocular pressure (IOP). This eye disorder, usually without symptoms, leads gradually to loss of vision. This is a major cause of blindness worldwide. The raised IOP is the result of an imbalance between secretion and drainage processes of aqueous humor within ocular chambers. Dorzolamide (DZD) is a carbonic anhydrase (CA) inhibitor used in management of glaucoma. Other researchers reported that only 5% of the free drug applied successfully penetrates through the cornea. using drug-loaded hydrogels, as soft contact lenses, increases the residence time of ophthalmic drug in the tear film.

Methods:

The aim of the present study was to prepare nanoparticles of molecular imprinted polymers (MIPs) with high loading capacity for dorzolamide as template drug. To achieve this goal, a computational protocol was employed to select the most appropriate monomer for MIP preparation. Density functional theory (DFT) method at the B3LYP level of theory in conjugate with the 6-31+G(d) basis set was used to evaluate the extent of interaction between dorzolamide and a small library of frequently used vinylic monomers by using gaussian 09w program. The results revealed that HEMA (Hydroxyethylmethacrylate), methacrylic acid (MAA) and MMA (Methyl methacrylate) can be considered as suitable monomers; To form an elastic network, cross-links were introduced into the system using ethylene glycol dimethacrylate (EGDMA) as the cross-linker. Experimental design software (Design Expert v10 program) was used after the production of MIP to optimize the maximum absorption.

Results:

The results showed that using MAA and MMA as co-monomers and applying molecular imprinting technique increased loading capacity of hydrogels. The optimized imprinted hydrogel prepared with 3mM HEMA, 2 mM MAA, 1 mM MMA 34 mM EGDMA and 1 mM DZD: the highest affinity for DZD and the greatest ability to control the release process in aqueous media. Our data indicated that the use of suitable co-monomer and applying a molecular imprinting technique had important influence on loading and release.

Keywords:

ocular drug delivery systems. Molecular imprinting. soft contact lenses. Dorzolamide. Experimental design

References:

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Fabrication and in vitro characterization of berberine loaded electrospun gelatin-chitosan nanofiber

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Poster 88

Abstract Presenter:

Mahshid Kargar

* **Correspondance:**

Seyed Alireza Mortazavi

Introduction:

Berberine, an isoquinoline alkaloid, with wide range of therapeutic effects including anti-inflammatory, antioxidant and antimicrobial effects. Gelatin and chitosan are two natural, biocompatible and biodegradable polymers with abundant resources. In this study, gelatin blended chitosan electrospun nanofibers fabricated and characterized.

Methods:

For optimization of berberine nanofibers, various mass ratios of gelatin-blended-chitosan (100:0, 70:30, 50:50, 30:70) were prepared and electrospinning parameters (such as voltage and flow rate) were investigated. The fiber morphology and structure were determined by SEM, XRD and AFM analyses. Dispersion of berberine chloride in nanofibers was confirmed by functional groups investigated by FT-IR. Drug content and in vitro release behavior were assessed by UV spectroscopy.

Result:

SEM and AFM experiments showed blended ratio of gelatin/chitosan (70:30) fabricated smooth, beadless fibers with average diameter between 240 to 300 nm. Other blended nanofibers showed beads in the fibers. FT-IR indicated absence of interaction between ingredients and blended-polymers. Content of loaded drug was about 85% and the formulation presented approximately 97% drug release from nanofibers within 24 h in a controlled manner.

Conclusion:

Based on these results, gelatin-chitosan nanofibers were successfully fabricated. Due to stability, biocompatibility, high drug loading and controlled release behavior; the electrospun nanofibrous mats show excellent ability for biomedical application.

Keywords:

Berberine, chitosan, gelatin, electrospinning, nanofiber

References:

- Li, H.-m., et al. (2011). "Berberine protects against lipopolysaccharide-induced intestinal injury in mice via alpha 2 adrenoceptor-independent mechanisms." *Acta Pharmacologica Sinica* 32(11): 1364.
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Preparation and in vitro evaluation of atorvastatin solid dispersion

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5-7 February 2020

Poster 89

Abstract Presenter:

Elahe Faraji

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Mohammad Mehdi
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Introduction:

Hyperlipidemia is the presence of elevated levels of lipids in the blood. Lipid abnormalities are extremely common in general population and are regarded as a highly modifiable risk factor for cardiovascular diseases. Atorvastatin calcium (ATC) as a selective competitive inhibitor of HMG COA reductase is most commonly used to treat this disease. ATC has low aqueous solubility resulting in low oral bioavailability (14%) and thus presents a challenge in formulating a suitable dosage form to improve the aqueous solubility. The purpose of the present study was to investigate the effect of polyethylene glycol (PEG) molecular weight 10000 and PVPK-30 as solid dispersion (SD) carriers on the dissolution behavior of atorvastatin.

Methods:

Solid dispersion of ATC using carrier PEG 10000 and PVPK-30 was formulated in different weight ratios by solvent evaporation and melting method respectively. Formulation was evaluated for dissolution rate in phosphate buffer solution (PH 6.8) and aqueous solubility by UV spectrophotometer analysis.

Result:

The optimum formulation obtained by PEG 10000 and PVPK-30 in 1:5 (drug to polymer) weight ratio showed increased in aqueous solubility and dissolution rate more than 70 % compared to intact drug.

Conclusion:

The result confirmed that PEG 10000 and PVPK-30 are suitable carriers with noticeable influence on the drug dissolution rate and aqueous solubility of atorvastatin.

Keywords:

Atorvastatin calcium, Solid dispersions, Aqueous solubility, PEG 10000, PVPK-30

References:

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Preparation and physicochemical characterisation of Dextran-PLGA micellar system as a potential drug delivery system for hydrophobic drugs

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5-7 February 2020

Poster 90

Abstract Presenter:

Leila Behbood

*** Correspondance:**

Leila Behbood

Introduction:

A nanomicelle based drug delivery system is a formulation that can improve the bioavailability and dissolution rate of water insoluble drugs.

Methods and Results:

In this study the dextran-PLGA copolymer was synthesized with esterification reaction confirmed using the FTIR and NMR spectroscopy. The used method for nanomicelle preparation was nanoprecipitation and the CMC value was obtained 10 µg/ml. The particle size of nanomicelle was less than 100 nm ± 4 nm with narrow size distribution (PDI= 0.06). Hydrocortisone was loaded to this system. The obtained results for the encapsulation efficiency were 79%, and the drug release was adjusted to a first-order kinetic model with 90% release of drug within the 12 hours. The MTT assay showed that even in high concentration of micelle the cell viability was remain higher than 90%.

Conclusion:

The Dextran-PLGA micellar system exhibited suitable physicochemical properties to consider as a drug delivery system for lipophilic drugs.

Keywords:

Micelle, copolymer, lipophilic drug

References:

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Preparation and in-vitro characterization of thermosensitive insitu-gel nanoemulsions for intranasal delivery of temozolomide

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5-7 February 2020

Poster 91

Abstract Presenter:

Masoumeh Bayanati

* **Correspondence:**

Mohamad Mehdi
Mahboobian

Introduction:

Temozolomide as the first line agent of chemotherapy in brain tumors must be administrated in high doses in systemic use due to its short serumic half-life. The aim of this study was to develop a thermosensitive insitu-gel nanoemulsion for intranasal use in order to bypass BBB, optimize drug delivery, and reduce side effects.

Methods:

Nanoemulsions (NEs) containing TMZ were prepared by low energy method. NEs with different weight ratios of oil, surfactant and co-surfactant were prepared and evaluated regarding their droplet size, zeta potential, refractive index and long term stability. Chitosan as a mucoadhesive agent and poloxamer (407 and 188 in different weight ratio) as thermosensitive gelling agent were added to the formulation, and gelling temperature, mucoadhesion ability, release pattern, viscosity and other physicochemical properties were measured.

Result:

The optimum insitu-gel NE formulation containing triacetin, transcutool P, poloxamer 407, poloxamer 188 and chitosan showed suitable droplet size less than 50 nm with sustained release pattern, mucoadhesive properties for intranasal use.

Conclusion:

This study exhibited that optimum insitu-gel formulation has suitable invitro properties for intranasal use.

Keywords:

Nanoemulsion, insitu-gel, temozolomide, mucoadhesion, CNS drug delivery

References:

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Evaluation and Formulation of Hydrogel_Based Cerium Nanoparticle in Wound Dressing

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Poster 92

Abstract Presenter:

Niusha Mirzaee

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Mehdi Ranjbar

Introduction:

Modern drug systems have a special place in the pharmacy due to their particular advantages. The benefits of these systems include continuous and continuous drug release and reduced drug use. Since topical formulations are difficult to use in deep cuts and wounds, the production of a formulation with the least effective dose can help the wound healing process. In these cases, infection control is also important. Cerium metal, due to its wound healing and antimicrobial properties, can be used as a wound healing material. Therefore, the production of a formulation with wound healing and infection control effects is investigated in this study.

Method and Results:

To prepare the hydrogels, we first purify the monomers used by vacuum distillation and then, using different formulations, we will produce the hydrogels. Two different monomers will be used to produce the hydrogels, which will be approximately identical. In this section, we will use radical polymerization in the solution phase. After preparing the solutions, we will place the polymeric samples at 5 °C for 1 minute and the nanoparticles for 5 minutes at different capacities of the microwave to initiate polymerization and at C 9 and complete the polymerization. To remove unreacted materials from the hydrogels, we will place them in deionized water for 4 hours. In the next step, by making cerium nanoparticles, liquid-soluble chemical methods are first discussed.

Conclusion:

The F6 formulation with a particle size of 342.09 nm was selected as the optimum formulation. Optical formulation analysis including XRD, FT-IR, and EDX shows the appropriate crystalline phases formation, confirming the functional groups and the percentage of elements in the formulation. The percentage of cerium element in the formulation was 39.65%. In terms of rheological properties, this formulation is a pseudoplastic non-Newtonian system. The percentage of active ingredient of the formulation was 96%. The percentage of hydrogel swelling in this formulation was calculated to be 70%.

Keywords:

cerium nanoparticles, Nanostructure, wound healing, Modern drug delivery systems

References:

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Green Synthesis and Characterization of Chitosan Bi (OH) 3 Nanostructures by Hydrothermal-Microwave Synthesis for Antimicrobial Effects

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5-7 February 2020

Poster 93

Abstract Presenter:

Fatemeh Mehrabi

*** Correspondance:**

Mehdi Ranjbar

Introduction:

Nanomaterials science is concerned with materials and systems whose structure and components exhibit particular physical and chemical properties due to their nanometric dimensions. The goal is to develop nanotechnology, control structures and, study the behaviors.

Method and Results:

nanocomposites synthesized by assistant hydrothermal-microwave method and physicochemical properties measured by FTIR, SEM, and AFM. then Minimum Inhibitory Concentration (MIC) method used to investigate the antibacterial effect of the composites. In this method after the first run with 8 concentrations and observation of results, we repeated the tests with 12 concentrations of nanocomposites. 19 small tubes and 12 large tubes, one 5 ml balloon and two 500 mL Erlenmeyer flask were used. To prepare 300 ml of Muller Hinton agar medium, 11.4 g powder weighed and poured into a 500 ml Erlenmeyer to dissolve. To prepare 100 ml of Muller Hinton broth, 2.1 g of powder weighed and dissolved in another 500 Erlenmeyer. Then 18 cc of solid medium removed by pipette and poured into each of the 12 large tubes and after the preparation of 12 concentration of nanocomposites in small tubes by broth medium, 2 ml of broth medium added to large tubes and the tubes closed. microbial suspension prepared at 7 left small tubes. And the inoculation occurred. The result read after 24 hours.

Conclusion:

Since the antimicrobial effects of chitosan nanostructures loaded by bismuth hydroxide nanoparticles had not been investigated before, this research first made nanoparticles at different stabilizing sizes and concentrations and then prepared microbial culture media using MIC method And tested on seven types of Gram-positive and Gram-negative bacteria and the result showed a synergistic effect of chitosan and bis

Keywords:

bismuth hydroxide, nano composite, chirosan

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Formulation and Preclinical Evaluation of Albumen-based and Gelatin-Based Tissue Adhesives for Wound Closure and Comparative Study Between Them

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5-7 February 2020

Poster 94

Abstract Presenter:

Sam Talaei

*** Correspondance:**

Hamidreza Moghimi

ABSTRACT:

Current techniques for wound healing, such as sutures or staples, can produce inflammatory responses that cause to prolong the healing time and increase scar tissue after healing. Tissue adhesives are a promising non-invasive method for tissue closure. The purpose of this study was to prepare tissue adhesive formulations by using natural materials, which are biocompatible.

In this study, the formulation of the adhesive was prepared at there's optimum ratio. The rheological behavior of adhesives was tested. The water content of these adhesives was measured by TGA as well as thermogravimetry by scales. The gelation time of gelatin adhesive was measured at 37 ° C. Tensile strength test was performed to evaluate the strength of adhesives. The adhesives were also assessed for biodegradability and cytotoxicity. The effect of adhesives on the animal model was also investigated.

The adhesive formulation showed the best adhesion performance for 50% aqueous gelatin, honey, and 7% chitosan in a ratio of 1: 2.5: 3. The optimum formulation of albumen glue was also obtained from a solution containing 1 g egg powder in 1 ml of water. Gelatin adhesion viscosities were measured at 20360, 13100, and 5150 cP at 50, 60, and 70 ° C, respectively. Albumen-based adhesive viscosity was also measured at 1000 cP. In addition, the amount of water in gelatin and albumen adhesives was 54.17% and 47.72%, respectively. The gelation time of gelatin adhesive was measured 10 minutes. Both adhesives had an excellent performance in toxicity and biodegradability tests. In addition, it was found that the adhesion strength of albumen-based adhesives was significantly higher than gelatin adhesives (P-value 0.001). In animal testing, however, albumen glue failed to adhere to the wound, whereas gelatin adhesion attached the edges of the wound and shortly healed the wound.

Gelatin adhesive seems to be a good alternative for sutures and staples for wound closure due to its excellent adhesion durability, biodegradability, non-toxicity, results of animal studies as well as the availability of raw materials and easy production process.

Keywords:

Gelatin, Honey, Chitosan, Albumen, Adhesive

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Preparation, Box-Behnenken Statistical Optimization and In Vitro Characterization of a Self Nano-Emulsifying Drug Delivery System (SNEDDS) for Oral Delivery of Budesonide as a Poorly Soluble Drug

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5-7 February 2020

Poster 95

Abstract Presenter:

Mozhgan Roustaei

*** Correspondance:**

Sahar Khoshyari

ABSTRACT:

Self nano-emulsifying drug delivery systems (SNEDDS) can be used to improve oral bioavailability of lipophilic drugs. The aim of this study was preparation and characterization of a SNEDDS for oral delivery of budesonide as a poorly soluble drug. For preparation of SNEDDS, budesonide (20 mg) was dissolved in the mixture of liquid paraffin, Tween 80 and propylene glycol. The box-behenken response surface methodology was used for statistical optimization. Prepared mixtures were then diluted in simulated intestinal fluid (SIF) and their physico-chemical characteristics were studied. Then, SNEDDS were evaluated morphologically using TEM. Finally, in vitro release profile of budesonide from nano-droplets was determined in SIF. The size, PdI, zeta potential and entrapment efficiency of statistically optimized SNEEDS were reported as $146\pm 37\text{nm}$, 0.211 ± 0.06 , $+3.6\pm 0.84\text{mV}$ and $94.3\pm 6.58\%$, respectively. TEM images revealed spherical nano-droplets. The release profile of budesonide from nano-droplets exhibited $33.81\pm 1.67\%$ of drug release in SIF during 360 min of incubation at 37°C indicating sustained drug release.

The obtained data revealed that SNEDDS could be regarded as a good candidate for oral delivery of budesonide as a poorly water soluble drug exhibiting high first pass metabolism.

Keywords:

Budesonide, poorly water soluble drugs, Self Nano-Emulsifying Drug Delivery System (SNEDDS), Oral delivery, Lymphatic absorption

References:

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Study of Bevacizumab Release Kinetics from Triblock Copolymer NIPAM-PEG-NIPAM in-situ Gel

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5-7 February 2020

Poster 96

Abstract Presenter:

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Zahra Jafariazar

Introduction:

Bevacizumab is a humanized monoclonal antibody with an anti-VEGF activity and is an off-label drug for choroidal neovascularization treatment. NIPAM is a thermo-responsive polymer, used for eye in-situ gels and as a homopolymer, it represents the lower critical solution temperature (LCST) around 32°C. NIPAM can be copolymerized with hydrophilic monomers like PEG to reach eye physiological temperature. PEG is used widely in pharmaceutical applications because of its non-toxicity and biodegradability character. By observing adverse reactions of repetitive intravitreal injections and low bioavailability of drugs in the eyes, developing a controlled release formulation of bevacizumab was considered by NIPAM copolymerization.

Methods and Results:

We had synthesized triblock copolymer NIPAM-PEG-NIPAM as a controlled release system. To gain release information, two methods were conducted. Method one: First, the release medium contains 1ml of PBS/BSA/ Sodium azide (pH=7.4), was heated to reach 37 °C temperature. Then, the bevacizumab-copolymer solution(20%w/v) was added to the medium. Method two: First, bevacizumab-copolymer solution(20%w/v) underwent a phase transition at 37 °C temperature to form a gel and then, 1ml of the above medium was added. 200 µl samples were withdrawn in pre-determined intervals and release percentages of bevacizumab from the in-situ gel were compared to the standard release, both analyzed using ELISA in 450nm. Main release kinetic models including zero-order, first-order, Higuchi, Hixson-Crowell, and Korsmeyer Peppas, were applied. In method one, the first-order model fits well according to the correlation coefficient value (R). value (R). In method two, release data did not follow Fickian-kinetic models and based on the Korsmeyer Peppas equation, release exponent value (n) was 0.578.

Conclusion:

The first-order model, indicates the Fickian-diffusion mechanism in method one. Calculated n value (0.45<n< 0.89) in the Korsmeyer-Peppas model, shows that the anomalous diffusion mechanism (a combination of both diffusion and erosion) occurs in method two. Overall, it appears that based on the chosen method, the bevacizumab release mechanism can be different. As gel formation occurred immediately in method one, results are more realistic and in vitro analysis can be closer to in vivo results.

Keywords:

Release Kinetic, Bevacizumab, in-situ gel

References:

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Buprenorphine HCl release from an in situ forming gel of triblock using NMP solvent

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5-7 February 2020

Poster 97

Abstract Presenter:

Farzin Hadizadeh

*** Correspondance:**

Farzin Hadizadeh

Introduction:

An in situ forming gel (ISFG) of buprenorphine (BP) was prepared using PLGA-PEG-PLGA (triblock) and N-methyl-2-pyrrolidone as solvent for decreasing the initial burst release.

Methods and Results:

Supercritical CO₂ method was used for ring opening polymerization of triblock. The optimum formulation of ISFG was achieved based on a minimum initial burst release of BP in the in-vitro release media using Box-Behnken design. In-vitro, ex-vivo, and in-vivo studies of ISFG were compared with an in situ forming implant (ISFI) composed of copolymer PLGA 504H (similar to RBP-6000). The initial burst release from in vitro media for the ISFG (6.19 ± 0.31 %) was significantly lower than that for the ISFI (13.45 ± 1.14 %) because the thermosensitive property of the triblock and hydrogen bonding between the NMP molecules and the PEG of the triblock prevented the NMP from diffusing rapidly into the release medium. The C_{max} of BP (6.95 ± 0.98 ng/mL) from the ISFG was significantly ($p < 0.05$) lower than those from the ISFI (8.19 ± 1.02). Furthermore, the AUC, the range of serum concentration (C) of BP for the ISFG (AUC = 2721.38 ± 69 , C = 1.87–7.12) formulation were similar to those for ISFI (AUC = 2727.36 ± 71 , C = 1.75–10).

Conclusion:

The results suggest that the ISFG can be used as a new type of sustained-release injection formulation with a smaller initial burst release than the ISFI.

Keywords:

triblock, buprenorphine, PEG, sustained release, NMP

References:

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Ascorbic acid and Caffeine-loaded nanofiber for wound healing in rat model

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5-7 February 2020

Poster 98

Abstract Presenter:
Laya Avizheh

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ABSTRACT:

The aim of this work is to formulate vitamin C and caffeine-loaded nanofiber and to investigate their effects on wound healing in rat model. Materials and methods: A wound-healing drug delivery system was developed from electrospun nanofiber containing ascorbic acid and caffeine. Physicochemical characteristics of spun nanofiber films were investigated using SEM and FTIR and viscometer. Stability studies were carried out for 45 days at room temperature and in the fridge. In vitro drug release was performed at 25°C and 32°C. Antifungal effect of samples was tested using disc diffusion method. Wound healing activity of the nanofiber mats was investigated in in-vivo using rat model with skin excision. Wound closure rate and histological findings were reported.

Results and discussion: The inhibition zone diameter increased to 7.7 mm for samples containing both caffeine and ascorbic acid where the antifungal effect was enhanced. Animals treated with ascorbic acid showed well-formed thick granulation tissue as well as collagen deposition and very few fibroblast cells. Blood vessels were increased in caffeine-loaded nanofiber group. Wound dressings containing both ascorbic acid and caffeine enhanced wound closure.

The findings of the present study suggest the benefits of topical ascorbic acid and caffeine for its high wound-healing effects.

Keywords:

Wound healing, Vitamin C, Caffeine, Nanofiber, Rat

References:

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Design and Evaluation of a Topical Wound Healing Gel Formulation of *Myrtus communis* Fruit

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5-7 February 2020

Poster 99

Abstract Presenter:

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Fatemeh Ghorbani Bidkorbeh

Introduction:

Utilizing herbal medicine since the era of ancient civilizations has proven the importance of natural therapeutic formulations in skin care. *Myrtus communis*, which grows in various parts of its natural habitat as 21 wild populations in Iran, has been used for centuries in herbal medicine for treatment of a variety of ailments. 1,8-cineol as the main compound of *Myrtus communis* has shown anti-inflammatory, anti-oxidant, anti-microbial and significant wound healing properties. The present research was undertaken with the aim to formulate and evaluate a topical wound healing gel containing *Myrtus communis* aqueous extract.

Methods and Results:

Fruits of *Myrtus communis* were collected from FirouzAbad, Fars province, Iran and authenticated at the school of pharmacy, Shahid Beheshti University of Medical Sciences. The extraction process consisted of several steps—drying, filtration, extraction, and concentration by heat. The gel formulation was designed by using aqueous extract of *Myrtus communis* fruit in 6% w/v concentration and was carried out by using various polymer bases (different concentration of high, medium and low molecular weight Chitosan, Carbopol 934, Carbopol 940). The physicochemical parameters of mentioned formulations such as pH, rheology, spreadability, appearance, etc. were determined and the best results were obtained from the gel prepared with medium molecular weight chitosan and acetic acid (glacial). In addition to better physicochemical qualities, this gel formulation is preferable due to the notable wound healing, anti-bacterial and biocompatible properties of chitosan.

Conclusion:

This study revealed that the formulation containing 6% w/v *Myrtus communis* aqueous extract with medium molecular weight chitosan as the polymer base has shown comparatively better stability and physicochemical qualities than other formulations. Aside from significant wound healing and anti-microbial effects of *Myrtus communis* aqueous extract the biocompatible, biodegradable and wound healing properties of chitosan in this formulation demonstrate potential for use as a safe and beneficial topical treatment in management of non-infected wounds.

Keywords:

topical gel, gel formulation, healing wounds, *Myrtus communis*, chitosan

References:

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Preparation and investigation of fluconazole nanosuspension properties using tween 20 and spawn 80

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5-7 February 2020

Poster 100

Abstract Presenter:

Elham Daftari fard

* **Correspondence:**

Houman Seraj

Introduction:

In recent years, nanoparticles have been widely used in drug delivery. Fluconazole is a lipid-soluble antifungal drug that inhibits cytochrome P450 enzymes. Moreover, it is used in the treatment of fungal infections, such as candida vulvovaginitis. This study aimed to investigate the properties of fluconazole nanosuspension using different surfactants. To this end, it was also attempted to increase the local effects and reduce the systemic effects of fluconazole.

Methods:

Ultrasonication was used to prepare fluconazole nanoparticles in both types (i.e., with and without polymers). To do this, the surfactant was dissolved in various concentrations in the deionized water, and the drug powder was dispersed in the surfactant solution by a high-speed homogenizer to achieve nanosuspension. Subsequently, the best formula was prepared for polymeric nanosuspension, and the polymer was added. Following that, the final formula was subjected to various tests, such as testing of release from dialysis membrane, microbial susceptibility test, Fourier transform infrared spectroscopy, and differential scanning calorimetry. Eventually, the results were analyzed using one-way ANOVA and the Tukey test.

Results:

The results obtained from this study showed that increased sonication time and hydrophilic-lipophilic balance had a direct effect on particle size reduction. Moreover, modification in formulation components had an impact on the drug release process in addition to affecting the properties of the nanoparticles. Additionally, the use of nanoparticles led to the efficacy of fluconazole in clinical strains resistant to this drug.

Conclusion:

According to the results, it can be concluded that the ratio of surfactants, the number of surfactants, and the sonication process have effects on the properties of the formulation.

Keywords:

Fluconazole, Nanoparticles, Suspension

References:

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Preparation and evaluation of pregabalin microemulsion for nasal delivery

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5-7 February 2020

Poster 101

Abstract Presenter:

Zahra Bagheri

*** Correspondance:**

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ABSTRACT:

Pregabalin is a useful drug for treatment of different disease like partial epilepsy, generalized anxiety disorder (GAD), neuropathic pain and post herpetic neuralgia. Intranasal delivery as a non-invasive route for drug administration has been exponentially increased. The objective of the current study is to formulate pregabalin-loaded microemulsion for nose-to-brain delivery.

Microemulsion was prepared using sort of oil (oleic acid), surfactants (tween20and 80 and sodium lauryl sulfate(SLS)), and co-surfactant (PG and PEG400 and ethanol) and purified water. A pseudoternary phase diagram for various proportions of water: oil was constructed. The effect of changing concentration of co-surfactant was also studied. It was also found that as the concentration of the surfactant was increased, the polydispersity index and stability of the microemulsion increased. After the identification of the microemulsion region, the composition of the microemulsion was fixed at oil 20-30%, Smix 40-50% and water 10-20% The prepared microemulsion was characterized for various parameters like turbidity , refractive index, zeta potential, average droplet size and polydispersity index and stability studies. All the evaluation parameters showed satisfactory results. The finding of the study illustrated that this novel microemulsion is a useful formulation for enhancing the bioavailability of pregabalin.

Keywords:

Pregabalin, nasal delivery, microemulsion

References:

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Folate receptor targeted delivery of erlotinib to breast cancer cells via functionalized graphene Oxide-Iron oxide nanocomposites

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5-7 February 2020

Poster 102

Abstract Presenter:

Mitra Dolatkah

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Mitra Dolatkah

ABSTRACT:

Targeted therapy in breast cancer believed to enhance therapeutic efficacy and reduce undesired side effect. Graphene-based nanosystems show potential as biocompatible drug delivery vehicle since their unique physicochemical features. Methotrexate (MTX) is a well-known antimetabolite which binds to folate receptors and inhibits dihydrofolate reductase. So, surface conjugation of MTX on NPs displays dual acting, as a targeting ligand and chemotherapeutic agent to achieve targeted chemotherapy. Erlotinib (Erl) is a quinazoline amine which inhibits tyrosine kinase activity of epidermal growth factor receptor. Erlotinib -Methotrexate loaded graphene oxide modified magnetic nanoparticle (Erl-MTX-GO-MNPs) was engineered as a platform for targeted combination therapy.

Methods: MNPs were prepared according to a thermal decomposition technique. Synthesis of GO was based on hammer's method. Then, GO and MNPs were successfully conjugated and functionalized with poly ethylene glycol to make them biocompatible. Erlotinib was loaded on NPs as an anti-angiogenic agent which control cell proliferation. The NPs were characterized using FTIR, TEM, DLS, and XRD analytical techniques. The cellular uptake of NPs was evaluated using flow cytometry. In vitro cell cytotoxicity were detected using FITC-labeled annexin V and MTT assay in 2D and 3D cultured MCF-7 breast cancer cells. One-way analysis of variance (ANOVA) was performed to analyze the significance of the experimental data vs. the control. Student's t-test statistical analyses were carried out to compare two groups together. The statistical analysis software was SPSS Version 16.0.

Results and discussion: The obtained results showed layered and monodisperse NPs with an average size of 176.1 nm and PDI 0.49. The FT-IR results confirmed the surface modification of the NPs. The flow cytometry analysis revealed that MTX conjugation could significantly increase internalization of NPs by folate receptor positive MCF-7 breast cancer cells as compared to the folate receptor negative A549 cells. Furthermore, in vitro cell cytotoxicity assay showed that targeted combined therapy can efficiently inhibit cell growth. All experiments were performed in triplicate. P value < 0.05 shows significant difference.

In conclusion, Erl-MTX-GO-MNPs is proposed for effective targeted combination therapy in breast cancer.

Keywords:

Targeted therapy, Breast cancer, Combination therapy, Erlotinib.

Methotrexate-graphene oxide modified magnetic nanoparticles for combined chemo and photothermal therapy of breast cancer

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5-7 February 2020

Poster 103

Abstract Presenter:

Mitra Dolatkhah

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Mitra Dolatkhah

Introduction:

The current breast cancer treatment modalities in clinical need to be improved to tackle with pitfalls such as undesired side effects and drug resistance which cause disease relapse after a vigorous treatment. Due to unique physicochemical features of graphene-based nanosystems, they offer opportunity in this regard. Methotrexate is a folate derivative and antimetabolite used in various cancer treatment. Methotrexate loaded graphene oxide modified magnetic nanoparticle (MTX-GO-MNPs) was developed as a platform for targeted chemotherapy and photothermal therapy (PTT).

Methods:

GO was prepared according to hammer's method by oxidation of graphite. MNPs were synthesized using a thermal decomposition technique. Then, the composite of GO and MNPs were successfully synthesized and functionalized with PEG polymer to modify their biocompatibility. Methotrexate was conjugated onto NPs as a chemotherapeutic agent and targeting ligand to achieve targeted chemotherapy. The NPs were characterized using FTIR, TEM, DLS, VSM, and XRD analysis. Biological impacts and photothermal effects of NPs were evaluated using FITC-labeled annexin V and MTT assay in MDA-MB231 and MCF-7 breast cancer cells. To determine the efficacy of GO-MNPs for PTT, low doses of the near-infrared (NIR) laser irradiation were used. One-way analysis of variance (ANOVA) was performed to analyze the significance of the experimental data vs. the control. Student's t-test statistical analyses was carried out to compare two groups together. The statistical analysis software was SPSS Version 16.0

Results and Discussion:

The results exhibited layered and monodisperse NPs with an average size of 176.1 nm and PDI 0.49. The FT-IR results confirmed the surface modification of the NPs. The flow cytometry analysis revealed that MTX conjugation could significantly increase internalization of NPs by folate receptor positive MDA-MB231 and MCF-7 breast cancer cells as compared to the non-targeted NPs. Furthermore, in vitro cell cytotoxicity assay showed that combined therapy had higher cytotoxicity as compared to single photothermal therapy or chemotherapy. All experiments were performed in triplicate. P value < 0.05 shows significant difference between control and treated group.

Conclusion:

Based on our findings, MTX-GO-MNPs is proposed to be a potential multimodal targeted nanomedicine/theranostic against breast cancer cells.

Keywords:

Breast cancer, Nanomedicine, Photothermal therapy, Theranostic.

Preparation and in vitro characterization of doxorubicin encapsulated multivesicular liposomes

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Abstract Presenter:

Mohammad Ali Mahjoub

*** Correspondance:**

Simin Dadashzadeh

ABSTRACT:

The aim of the present study was to develop a novel formulation of multivesicular liposomes for Doxorubicin (DOX) to enhance the antitumor effect on breast cancer by direct intratumoral injection. DOX is one of the effective antitumor agents but, due to the dose dependent cardiotoxicity and nephrotoxicity, its use has limitations. Intratumoral injection of DOX encapsulated multivesicular liposomes (DOX-MVLs) could be a logical strategy to reduce its systemic toxicity while improving the antitumor efficacy. Liposomes were prepared by double-emulsion method, and the effective factors on formulation were screened by 2-level factorial design. The morphology, particle size, and percent of drug-encapsulation efficiency of DOX-MVLs were investigated. Furthermore, DOX release from the prepared formulations was also studied in vitro. The results showed that DOX-MVLs were spherical particles with an average particle size of $9.5 \pm 1.23 \mu\text{m}$ and an encapsulation efficiency up to $83.3\% \pm 0.72\%$. The in vitro release of DOX from DOX-MVLs exhibited a sustained profile, indicating a longer mean release time compared to DOX solution. In conclusion, the combination of DOX and MVL drug delivery system due to its slow release and high drug encapsulation can provide higher therapeutic efficacy. The present study may hold promise for DOX-MVLs as a new formulation for sustained-release drug delivery in local cancer therapy.

Keywords:

Doxorubicin, multivesicular liposome, in vitro release, intratumoral injection

Besifloxacin ocular nanoemulsions: Novel strategy for treatment of ophthalmic infections

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5-7 February 2020

Poster 105

Abstract Presenter:

Seyedeh Negin Kassae

*** Correspondance:**

Mohammad Mehdi Mahboobian

Introduction:

Ocular bacterial infections such as conjunctivitis and keratitis are major causes of visual morbidity worldwide. Fluoroquinolones are commonly used to treat these infections, but since resistance to older agents has been reported, the novel 8-chloro-fluoroquinolone named Besifloxacin; available as ocular suspension (Besivance) is being used recently. The aim of this study was designing novel delivery system of besifloxacin to enhance ocular bioavailability and therapeutic efficiency.

Methods:

Based on Pseudo-ternary phase diagrams of quaternary systems consisting of oil (triacetin), surfactant (Cremophor RH 40), co-surfactant (Transcutol P), and water, Besifloxacin nanoemulsions (0.2wt%) were developed using low energy emulsification method. Physicochemical properties including particle size, poly-dispersity index (PDI), pH, osmolality, viscosity, refractive index and accelerated physical stability of formulations were evaluated. Based on physicochemical evaluation, the optimum formulation was selected to investigate in-vitro drug release, permeation study, HETCAM toxicity and antimicrobial efficiency.

Results:

The optimum NE formulation demonstrated nanoscale droplets of 13 nm with acceptable PDI. Other physicochemical properties were also suitable for ophthalmic administration and no physical instability was observed. Drug release pattern was sustained and permeation through bovine cornea was improved compared with control suspension more than 1.5 fold. No irritation was observed after HETCAM test, so the optimum formulation could be well tolerated. In vitro antimicrobial evaluation, showed comparative efficacy of lower drug loaded NE (0.2%) versus Besifloxacin commercial suspension.(0.1%)

Conclusion:

These finding demonstrated that this new Besifloxacin formulation considered as a novel delivery system for treatment of bacterial eye infections.

Keywords:

Nanoemulsion, Besifloxacin, ocular

References:

Shah J, Nair AB, Jacob S, Patel RK, Shah H, Shehata TM, Morsy MA. Nanoemulsion Based Vehicle for Effective Ocular Delivery of Moxifloxacin Using Experimental Design and Pharmacokinetic Study in Rabbits. Pharmaceutics. 2019 May 11;11.(5)

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The Impact of the Production of Active Pharmaceutical Ingredients on the Price, Quality, and access of Medicines: The Case of Iran

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5-7 February 2020

Poster 106

Abstract Presenter:

Sajjad Esmaeili

* **Correspondance:**

Nazila Yousefi

Introduction:

Active Pharmaceutical Ingredients (APIs) are a significant contributing factor to the price, quality, and access of pharmaceutical products. That explains why countries often develop their policy of supplying APIs based on these three factors. This study examines the impact of the production of APIs on the price, quality, and access of medicines in the context of Iran .

Methods:

this study was done qualitatively and quantitatively. In the qualitative phase, semi-structured interviews were held with leading experts in the field, and the thematic analysis method was used to extract the data. In the quantitative phase, the price of domestic APIs was compared to that in China and India in the case of 50 pens of medicines, and the ratio of the API price to the final product was determined. In addition, manufacturers of finished products were surveyed about the quality of domestic and imported APIs .

Results:

in 45 pens, the price of domestic APIs was higher than that of their counterparts imported from China and India. Judging by the opinion of quality control inspectors in drug manufacturing companies, the quality of domestic APIs was also far inferior to that of the imported ones. Also, according to expert opinion, although the production of APIs in the country improves access to finished products, it does not guarantee it.

Conclusion:

economic reasoning and quality of APIs in supply constitute the business principles of drug manufacturers, and to promote market of domestic products, they should replace price and quality leverages with supporting ones.

Keywords:

API, price, quality, domestic production

References:

Tahriri F, Osman M, Ali A, Yusuff R, Esfandyari A. AHP approach for supplier evaluation and selection in a steel manufacturing company. Vol. 1, Journal of Industrial Engineering and Management. 2008 .

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Comprehensive Evaluation of Opioid Analgesic Use in Iran During 2000-2017

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Abstract Presenter:

Mahya Rezaei

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Arash Kalantar

ABSTRACT:

Appropriate treatment of pain because of being irritating and affecting both individuals and society, is a controversial and significant International issue.

In clinical practice the major role of opioid drugs is the management of acute and chronic. Being initiated for a wide range of indications, increasing rate of cancer and the role of opioids in palliative care and the advent of different opioids with different aspects are the major reasons of ascending trend of opioid analgesics consumption. In addition, Opioids can pass through the blood-brain barrier and thus can be overused. Some patients, because of the fear of addiction, refrain from using them reasonably well. As a result, achieving balance in the rational consumption of opioids requires some investigations .

Our study aim is determining the total amount of opioids used for pain management and their trend of consumption during 2000-2017. Providing a comprehensive plan of opioid analgesics utilization in Iran, make it possible to improve rational prescription and use of analgesics by some appropriate interventions. In addition, unlike developed countries, there is no such study in our country.

Annual sales information is obtained from Iran's Food and Drug Organization, in which data are classified based on ATC/DDD system. We reported the amount of consumption based on Defined Daily Dose/1000 inhabitants/Day and OMEQ (oral morphine equivalent) /1000 inhabitants/Day. For analysis of data, methods such as mann kendall trend analysis and similar tests have been used and for statistical analysis, SPSS and R software have been used.

In general, the increase in strong opioid consumption persisted throughout the years 2000-2017, characterized by significant increases in oxycodone, fentanyl, buprenorphine, pethidine and to a lesser extent in morphine. Contrariwise, weak opioids such as tramadol and pentazocine utilization have been decreased. The number of opioids used in health system have been changed from 2 to 7 and in the following the total consumption of opioids have been increased significantly, about 450 folds higher. We also have examined the possible reasons for this trend such as new drug entrance.

Keywords:

opioids analgsics, pain management, rational use, over/under treatment

References:

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Network Analysis of Lipoma in the Mouse Embryonic Stem Cells (Data Mining Approach)

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Poster 108

Abstract Presenter:

Farshad Qalekhani

* **Correspondance:**

Azam Chahardoly

Introduction:

Systems pharmacology is the application of systems biology principles to the field of pharmacology. It seeks to understand how drugs and disease affect the human body as a single complex biological system. MEN1 is a tumor suppressor gene loss of which causes lipoma (fatty tumors under the skin) and many other endocrine and non-endocrine tumors. Its target genes in fat cells (adipocytes) are unknown. Gene expression in adipocytes that were in vitro differentiated from mouse embryonic stem cells (mESCs) of Men1-null (Men1-KO) and WT mice were compared to assess the expression of genes upon menin loss in adipocytes that could lead to the development of lipoma.

Methods:

To do this study, we have used a microarray data set (GEO accession number GSE65859) that includes samples of Men1-null vs wild type (WT) mouse embryonic stem cells. To identify the differential expressed genes (DEGs) we used the Limma package in the R programming language (suitable cutoff: $\text{Adj.P.Valu} \leq 0.05$ and $\log\text{FC} \geq \pm 1$). The lists of DEGs were submit to string database (<https://string-db.org/>) for assessment of the protein-protein intraction network. The GeneMANIA database was used to detect both validated and coexpression gene network interactions.

Results:

We detected the 620 number of DEGs in the comparison between WT and Men1-null. We have constructed PPI network using DEGs and protein interactions information obtained from STRING database. STAT3, EZH2, SMAD4, SUZ12, HNF4A, NFE2L2, TP63, REST and EGR1 are some of the TF that obtained by analyzing DE-TF network with helping to Cytoscape software and important proteins that play role in this pathway were shown by Cytoscape for instance GSK3B, CDK1, CSNK2A1 and so on.

Conclusion:

The lipoma is a benign tumor made of fat tissue. The cause is generally unclear. In this study we tried to find the hub genes and proteins using the system biology approach. Important transcription factor identified in the protein interaction network in lipoma Men1-null ESCs. The results of this study can be used for targeted drug design.

Keywords:

Adipocytes, Cytoscape, GeneMANIA, GEO, Lipoma, Systems pharmacology

References:

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- Network analysis of inflammatory responses to sepsis by neutrophils and peripheral blood mononuclear cells, R. Godini, H. Fallahi, E. Ebrahimie, PLOS ONE.
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Evaluation of Antibiotic of *Morus nigra* (Black Mulberry) Extracts

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5-7 February 2020

Poster 109

Abstract Presenter:

Sara Shahosseini

* **Correspondance:**

Sara Shahosseini

Introduction:

The mulberry belongs to the genus *Morus* of the family Moraceae. The edible fruit is dark purple or black when ripe. Mulberry is a good source of vitamins, minerals and contains a high amount of anthocyanins, which have antioxidant, anti-inflammatory and antibacterial effects. During the past century, researchers focused on the role of fruits and vegetables in human nutrition. The evidence gathered from in vitro and in vivo epidemiological studies, shows beneficial effects from phytochemical groups, in reducing disease risk, having antioxidant and antimicrobial characteristics. The purpose of this study was to investigate the antibacterial activities of water extracts obtained from fruits of morus nigra.

Material and Method:

Morus nigra fruits were collected in Tehran, Iran. Dry powdered Fruits were extracted with sterilized water with DMSO, and finally filtered. Antibacterial activities of the water extracts obtained from fruits of black mulberry (*Morus nigra*) were tested against *Staphylococcus aureus* and *Staphylococcus epidermidis* by Minimum Inhibitory Concentration (MIC) and Minimum Bactericidal Concentration (MBC).

Results:

Findings showed that the water extracts from fruits were active against *Staphylococcus aureus* and *Staphylococcus epidermidis*. The most antimicrobial effect was shown by water extract mulberry fruits against *Staphylococcus aureus* with 21mm inhibition zone and 10 mg/ml MIC value, following by *Staphylococcus epidermidis* with 25mm inhibition zone and 20 mg/ml MIC value.

Conclusion:

The present study carried out on the *Morus nigra* revealed the presence of bioactive constituents of medicinal values. The antimicrobial of the sterilized water extracts of the *Morus nigra* variants showed some inhibitory power against the microbes used for this research. However, future studies are needed to further work on the isolation and characterization of the Antibacterial activity in *Morus nigra*.

Keywords:

MBC, MIC, Antibacterial activity, BLACK MULBERRY

References:

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- Arfan et al, 2012 Arfan M., Khan R., Rybarczyk A., Amarowicz R. Antioxidant activity of mulberry fruit extracts International Journal of Molecular Sciences, 13 (2012), pp. 2472-2480
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Evaluation of anti-anxiety and anti-depressant effects of *Mentha spicata* and *carvone* using experimental model in male mice

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5-7 February 2020

Poster 110

Abstract Presenter:

Faraz Mojab

*** Correspondance:**

Faraz Mojab

ABSTRACT:

Depression, anxiety and sleep disorders are the major psychological problems in human life. Although there are several effective medications to treat or control these psychiatric disorders, most of these medications have limited efficacy and unwanted side effects. Researchers are always looking for new drugs, especially those of natural origin, and they hope that the investigation for newer medications, especially natural products, could be helpful to solve these problems. In this study we investigated the anti-anxiety, anti-depression, sedative-hypnotic and muscle relaxant effects of *Mentha spicata* essential oil and carvone, using experimental models including elevated plus maze, pentobarbital induced sleep and forced swimming and grip strength tests. Forced swimming test was carried out on Swiss male mice, while other tests performed on NMRI mice with a body weight of 20–25 g (n=10 in all groups). The *M. spicata* essential oil and carvone were prepared and then administered intra-peritoneally to mice at different doses. The effects of different doses of *M. spicata* essential oil and carvone were compared with the control group. In the elevated plus maze test, *M. spicata* essential oil showed significant effect at the dose of 200 mg/kg. *M. spicata* essential oil and carvone at different doses increased the sleeping time induced by pentobarbital and decreased the immobility time in the forced swimming test and increased the muscle relaxant effect by grip strength test in mice compared to the control group. The results indicate that the essential oil and carvone have anti-depressant, muscle relaxant and sedative-hypnotic activities. However, More studies are needed to find the exact mechanism involved in these activities.

Keywords:

Mentha spicata essential oil, carvone, Sedative-hypnotic, anti-anxiety, anti-depressant

Prunus Avium L. (Cherry) extract as a potential ingredient of anti-acne products

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5-7 February 2020

Poster 111

Abstract Presenter:

Niloofar Sharafi Tafreshi

* **Correspondance:**

Mohammad Kamalinejad

Introduction:

Anti-acne products are among the most popular products in the cosmeceutical industry. Various ingredients are used in these products, including herbal extracts. Herbal extracts are beneficial due to their potential antimicrobial, antioxidant, and/or antiageing effects. Studies have been suggested that *Prunus Avium L.* fruit is a source of various phenolic compounds, antioxidants, and flavonoids.

Methods:

2kg of *Prunus Avium L.* washed Fruits were macerated in water, as the extraction solvent, for 48hours. After the filtration and the evaporation of the water content, 20gr of the *Prunus Avium L.* Fruits extract was dissolved in low-PH water (with 0.01% HCl, pH ~2.3) to determine the amount of anthocyanin compounds by measuring the UV absorption via a UV/Vis spectrophotometer.

Also, Other stock solutions of *Prunus Avium L.* Fruits extract were prepared in DMSO solution (Less than 5 percent DMSO) to prepare different concentrations of the extract. Subsequently, these solutions were used to assay the antimicrobial effect of the extract by the well diffusion method. The two investigated bacterias in this study were staphylococcus aureus and Staphylococcus epidermidis. Finally, the zone of inhibition for each concentration and each bacterial species were measured and analyzed.

Result and Discussion:

Prunus Avium L. (Fruit) extracts of Iran's endemic flora contain moderate levels of anthocyanin. Also, this extract exhibits an acceptable antimicrobial effect on both staphylococcus aureus and Staphylococcus epidermidis .

This study suggests that the antimicrobial effect of *Prunus Avium L.* (Fruit) extracts makes it a potentially qualified ingredient to be used in anti-acne products. Also, further studies on antibacterial effects of *Prunus Avium L.* (Fruit) extracts, using other microorganisms and another measurement method, can be useful in the determination of the spectrum of its antimicrobial effect and provide new data for novel herbal-based antibiotics.

Keywords:

Prunus Avium L., anti-acne, staphylococcus aureus, Staphylococcus epidermidis, Anthocyanin

References:

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Investigation of cytotoxic effects of fractions of potent extract of *Eryngium thyrsoideum* on cancerous (MCF-7, MDA-MB-231) and non-cancerous (HFF-2) cell lines in vitro

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5-7 February 2020

Poster 112

Abstract Presenter:

Mahtab Partovi Arya

*** Correspondance:**

Mahtab Partovi Arya

Introduction:

Breast cancer is the most common cancer among women and has been growing in recent years. Herbal sources are one of the most important sources of anticancer drugs. *Eryngium* is one of the largest genera of Apiaceae family. Some important pharmacological activities of different species of *Eryngium* have been demonstrated in scientific studies including, antioxidant, anticancer, anti-inflammatory and antimicrobial activity.

According to the cytotoxic effects of different extracts of *E. thyrsoideum*, it seems to be logical to evaluate cytotoxic activities of fractions of potent extract of *E. thyrsoideum* on breast cancer cell lines (MCF-7, MDA-MB-231).

Methods:

The aerial parts of this species were extracted using n-hexane, dichloromethane and methanol by Soxhlet apparatus, respectively. Cytotoxic effect of different extracts was assessed by MTT colorimetric assay against MCF-7, MDA-MB-231 (breast cancer) and HFF-2 (Normal) cell lines during 24 and 48 hours and then the IC50 value was calculated in PRISM software. Subsequently, potent extract (Dried methanolic extract) was subjected to C18 Sep-Pak using step gradient of MeOH-Water. Subsequently, Apoptosis was evaluated on cancer cells by flow cytometry using annexin V/PI staining.

Results:

Among the different fractions of methanolic extract, 80% SPE fraction showed the highest cytotoxic effects on MCF-7 and MDA-MB-231. Potent fraction significantly ($p < 0.01$) inhibited the growth of breast cancer cell lines. It is worth to mention that, 80% SPE fraction selectively inhibits the growth of cancerous cells with minimum effect on normal cells. The results of flow cytometry confirm the apoptosis process.

Conclusions:

80% fraction of MeOH extract of *E. thyrsoideum* demonstrate cytotoxic and apoptotic effects on breast cancer cells and can be considered as potential source for developing novel drugs against breast cancer.

Keywords:

Eryngium thyrsoideum, cytotoxic effects, MTT assay, flow cytometry, breast cancer cell lines

References:

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Evaluation of anti-proliferative activity of *Eryngium caucasicum* on cancerous (B16) and non- cancerous (HFFF-2) cell lines in vitro

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5-7 February 2020

Poster 113

Abstract Presenter:

Zahra Rezaeiparam

*** Correspondance:**

Zahra Rezaeiparam

Introduction:

Cancer is one of the most important causes of death in the world. Many studies have shown that herbal medicines have an anti cancer activity. The genus *Eryngium* of the family of Apiaceae has many pharmacological activities such as: anti cancer, anti inflammatory, anti oxidant and etc. Anti cancer activities of *Eryngium* genus led us to study on anti-proliferative activity of *Eryngium caucasicum*.

Methods:

E. caucasicum was collected and its air-dried powder was soxhlet extracted using Methanol, Dichloromethane and n-Hexane as solvents. Extracts were dried by rotary evaporator. To find out the potent cytotoxic extract MTT colorimetric assay using B16 and HFFF-2 cell lines were applied. In order to do investigations on fractions of potent extract (n-Hexane) vacuum liquid chromatography was done, then to know the mechanism of cytotoxicity Flow cytometry using annexin V/PI kit was evaluated.

Results:

N-Hexane extract and its 40% and 60% fractions had most antiproliferative activity against B16 cell line with pvalue0.01 in comparison to control group, however they represented fewer cytotoxicity agains HFFF-2 cell line, also Flow cytometry analysis showed that potent extract and fractions caused cell death with apoptosis .

Conclusion:

According to the results of study, n-Hexane extract of *Eryngium caucasicum* and its 40% and 60% fractions have cytotoxic activity against B16 cell line by inducing apoptosis, also by considering the results of research on HFFF-2 cell line these extract and fractions indicates low adwers effects.

Keywords:

Eryngium caucasicum, antiprolifratve, cytotoxic, B16 cell line, HFFF-2 cell line

References:

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Composition of the Essential Oils of the Aerial Parts of Four Species of *Calendula* from Iran

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5-7 February 2020

Poster 114

Abstract Presenter:
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Ebrahim Salimi Sabour

Introduction:

Essential oils are important compounds that extracted from plants, therefore according to important roles of them in aromatherapy and their benefit biological effects such as: anti-bacterial, anti-fungal and ... effects we decided to detect the components of for species of *Calendula* from Compositae family.

Method:

C. officinalis was purchased from Zarband Company. Aerial parts of *C. alata* and *C. palestina* were collected from Ahwaz and *C. arvensis* was collected from Ramhormoz (Khuzistan) in March 2019. The essential oils were obtained by hydrodistillation of dried plant material and their composition was determined by GC-MS. Identification of individual constituents was based on comparison of the mass spectra of the components with the standards by computer matching mass spectral data.

Results and conclusion:

Alpha-cadinol (46.4%), delta-cadinene (43.4%) and thymol (3.5%) were the major components of *C. officinalis*. Iso-leden (24.2%), leden oxide (18.5) and delta-cadinol (11.2%) were the main compounds in *C. arvensis*. The essential oil of *C. alata* contained a high concentration of camphor (29.2%), trans-alpha-bisabolene (24.18%) and chrysanthenyl acetate (15.67%). Heptacosane (20.7%), delta-cadinol (13.75%) and iso-leden (10.8%) were the main components of *C. palestina*.

Keywords:

Composition, Aerial parts, *Calendula officinalis*, *Calendula alata*, *Calendula arvensis*

References:

- Composition of the Essential Oil of the Root of *Heracleum persicum* from Iran. Mojab F et al. IJPR. 2003. 245-247.
Composition of the Essential Oil of the *Arctium lappa* Root and Leaf. Mojab F et al. IJPS. 2018; 14 (2): 1-6.
Composition of the Essential Oil of Four Species of *Calendula*. Thesis. Armita Abbasian. Aut. 2019.

Study the cytotoxic activity of some plants in Lamiaceae family

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5-7 February 2020

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Abstract Presenter:

Shirin Moradkhani

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Shirin Moradkhani

ABSTRACT:

Considering the high prevalence of breast cancer (MCF7) and importance of natural sources in drug discovery, the aim of present study was to evaluate the cytotoxic activity of hydroalcoholic extracts of *Stachys lavandulifolia* and *Stachys inflata*. Antiproliferative effect was determined by MTT assay and reported as IC₅₀. IC₅₀ for SI and Si was 1445 and 396 µg/ml, respectively. Previous studies reported different values of IC₅₀ in comparison to present study. The difference may be as result of differences in growth stage of plants, growth region, type and mode of extraction.

Keywords:

Lamiaceae, *Stachys*, breast cancer, MTT assay, cytotoxicity

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A Galbanic Acid as a Suitable Candidate for Acetylcholinesterase Inhibition and a Potential Drug for Alzheimer's (In Silico Study)

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5-7 February 2020

Poster 116

Abstract Presenter:

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Introduction:

Alzheimer's disease (AD) is a chronic neurodegenerative disease that usually starts slowly and gradually worsens over time. Inhibition of acetylcholinesterase (AChE), the key enzyme in the breakdown of acetylcholine, is considered as a promising strategy for the treatment of Alzheimer's disease. A potential source of AChE inhibitors is certainly provided by the abundance of plants in nature. Galbanic acid (GA) is a biologically active sesquiterpene coumarin from *Ferula* species (Apiaceae). This compound showed various biological properties including anticancer, anticoagulant, antiviral, and antileishmanial activities. In this study, we investigated the effect of GA inhibition activity on the Acetylcholinesterase by in silico approach.

Methods:

The structure of AChE was derived from the crystal structure of the AChE complexed with Aricept (Donepezil) deposited in the RCSB (PDB ID: 1EVE). 3D structure of the GA was downloaded from PubChem (CID: 4220856). AChE and GA structures were modified using the AutoDockTools scripts in order to be docked by AutoDock Vina 1.1.2 with default parameters, where the grid center was situated on the inhibitor, in compliance with the crystal structure, and the grid size was equal to $2.73 \times 65.29 \times 67.26$ Å. The orientation with the lowest free energy of binding was only considered according to the Vina score.

Results:

Docking data show that GA has higher binding affinity to AChE (affinity: -11.1kcal/mol and RMSD = 0). GA interacted with 8 amino acid residues, this amino acid residues include: Trp84, Gly118, Tyr121, Phe290, Phe330, Phe331, Tyr334 and His440. The most of the interactions between the GA and the AChE binding site are similar to those that are within AChE, Aricept complex.

Conclusion :

The information gained from this study may assist in the discovery of potential AChE inhibitor. We can emphasize that GA can be considered as a potential lead structure in drug design. However, more experiments need to be performed for recognition of GA as lead compound.

Keywords:

Galbanic acid, Alzheimer's, Acetylcholinesterase, AutoDockVINA, PDB

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Hypocholesterolemic and anti-atherosclerotic effect of boiling water extract and selective fraction of *Prosopis farcta* in high fat diet-1 induced hypercholesterolemic rabbits

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5-7 February 2020

Poster 117

Abstract Presenter:

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ABSTRACT:

Prosopis farcta is used for treatment of atherosclerosis and cardiovascular diseases (CVD) in traditional Iranian medicine. Therefore, in this study, the effect of boiling water extract and selective fractions of *P. farcta* on atherosclerosis and hypercholesterolemia induced by high fat diet in animal models of rabbits was investigated

A total of 20 male New Zealand rabbits from Pasteur Institute were provided. Animals were randomly divided into five groups. The first group (normal group) received standard pellet food and other groups were received 2% cholesterol per day for 60 days. The second group (treated group) received 10 ml of boiling water extract of this plant daily, the third group (positive control group) received simvastatin 0.6 mg/kg daily, the fourth group (fraction treated group), and the fifth group (Negative control group) which received only empty water during treatment. Serum lipid parameters were significantly increased in the high fat diet groups in comparison with the normal group. The results of this study showed that total cholesterol (TC), triglyceride (TG), high-density lipoprotein (HDL), low-density lipoprotein (LDL), and very low density lipoprotein(VLDL) levels were significant different in the group treated with the boiling water extract and selective fraction of *P. farcta* (P 0.05) in comparison with negative control group. Microscopic evaluation of liver and aorta confirmed the effects of plant extract. Generally, current study showed that *P. farcta* extract can be effective in reducing the risk factors of atherosclerosis.

Conclusions: the results of this study showed boiling water extract and selective fraction of *Prosopis farcta* increased HDL cholesterol, decreases Triglyceride, total cholesterol and LDL cholesterol, which are risk factors for atherosclerosis. Also treatment with boiling water extract and selective fraction of this plant reduced fat deposition in liver tissue and aortic endothelial cells. Therefore, boiling water extract and selective fraction of this plant can be used to treat chronic and common atherosclerosis

Keywords:

Atherosclerosis, hypercholesterolemia, cardiovascular diseases, traditional medicine, *Prosopis farcta*

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Antibacterial study of total extract and different fraction of *Crocus sativus*. Leafs: MIC determination and bioautography

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5-7 February 2020

Poster 118

Abstract Presenter:

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Yalda Heydari

Introduction:

Since human existence on earth, exploitation of medicinal plants is a commonplace for liberation from pain and ailment. Despite notable progresses in modern medicine, insurmountable amount of medicinal herb's potential is needed to be recognized and utilized. Employing these potential resources to overcome today's medicine shortages and difficulties such as microbial resistance is a valuable opportunity to be seized. The path for pursuing medicinal plants research for finding, purifying and developing noble antimicrobial molecules should be surveyed more enthusiastically. Saffron (*Crocus sativus* L.) has a long history in Iranian traditional medicine for sedative, phlegmatic, gastric irritant, spasm relieving.

Methods:

Antimicrobial effect of ethanolic extract of *Crocus sativus* leafs against eight bacterial strains (four gram positive strains including *Staphylococcus aureus*, *Staphylococcus epidermidis*, *Micrococcus luteus* and *Bacillus subtilis* and four-gram negative strain such as *Eschericia coli*, *Klebsiella pneumonia*, *Pseudomonas aeruginosa* and *Serratia marcesens*) is assessed in this research. *Crocus sativus* leafs were collected in December from Khorasan Razavi province. Then after drying, maceration method was used for extracting the ethanolic extract of leafs. Concentrated extraction was utilized for studying the antibacterial effects by three method including the agar dilution, disc diffusion and bioautography.

Result:

Total ethanolic extract in agar dilution method showed antibacterial effect on two bacteria that are: *Eschericia coli* and *Pseudomonas aeruginosa* at 32 and 64 mg/ml concentration. In dick diffusion method also dichloromethane and methanolic residual fractions showed better effects than another fractions. Antimicrobial effect was observed for both bacterial strains throughout the plate in biotography method.

Conclusion:

Finally, the use of bioautography on sensitive gram-negative strains with the help of appropriate solvent system and the use of tetrazolium reagent indicated that the strains were susceptible to antimicrobial agents in saffron leafs extract.

Keywords:

Saffron, gram negative, Agar dilution, Disc diffusion, Bioautography

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In vivo evaluation of *Platanus orientalis* on its burn wound healing properties in topical formulations

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5-7 February 2020

Poster 119

Abstract Presenter:

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Somayeh Niknam

Introduction:

According to Iranian traditional medicine references (ITM), *Platanus orientalis* has been recommended for treating wounds. Furthermore, various anti-inflammatory and analgesic properties of its leaves have been investigated for burn wound healing [1, 2]. The hydroalcoholic and polyphenolic extracts of *P. orientalis* L. have also elaborated moderate analgesic effects [3, 4]. In this study, we developed topical formulations based on *P. orientalis* L. hydroalcoholic extract and evaluated its burn wound healing properties through an in vivo model.

Methods and Results:

The hydroalcoholic extract of the leaves of the plant was prepared by cold maceration in ethanol (80%) so the extract would contain a high percentage of tannins and phenolic compounds; total phenolic content assay and qualitative tannin tests were done on the resulting extract. Different topical formulations were prepared based on the extract and an in vivo test was run for 14 days in 6 test groups each consisting of 7 rats and the data were statistically analyzed. It was found that the hydroalcoholic extract of *P. orientalis* L. showed good healing properties against burn wounds in the in vivo test.

Conclusion:

In conclusion *P. orientalis* L. as recommended in ITM for burn wound healing showed desirable results in the in vivo test on rats.

Keywords:

Platanus orientalis, Burn wounds, Topical formulations, in vivo

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Phytochemical Standardization, Formulation and Evaluation of Oral Hard Capsules from *Pinus eldarica* Bark Extract

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5-7 February 2020

Poster 120

Abstract Presenter:

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* **Correspondance:**

L. Dayani

Introduction:

The extract of *Pinus eldarica* bark contains many polyphenolic compounds such as taxifoline, catechin and phenolic acids that have been studied by researchers and pharmacists due to their high antioxidant, anti-inflammatory and anti-mutagenic effects. Therefore, with a view to reducing production costs, potentials in the country's pharmaceutical industry, using native plant resources in the production of complementary products, as well as there was no design and formulation activities in this plant area, so we decided to conduct a study to phytochemical standardization and preparation hard edible capsules from the extract of Tehran pine (*P. eldarica*) bark.

Methods:

The bark of Tehran pine was collected and phytochemical and macroscopic tests were performed its powder. Extraction was carried out at room temperature for 72 hours using a mixture of ethanol and water (70:30) solvents. The extract solution was concentrated by vacuum distillation and the extract powder was obtained by freeze dryer. Quantification and standardization tests were performed by using Folin-Ciocalteu method and spectrophotometry at 765 nm. After designing different formulations, the extract powder was mixed with certain amounts of the excipients. Physicochemical tests were performed on different formulations. Finally, the formulations were inserted into hard capsules and pharmacopoeial tests as well as stability studies and non-interference effects of the active ingredients with excipients on the capsules were done.

Results:

The yield of extraction method in this study was 21.23%g/g. Using the calibration curve equation, the total phenolic content of the extract in terms of gallic acid equivalent was 362.8 mg/g of extract powder and also by the pharmacopoeia determination method, the total procyanidin content in the extract was 174.37 mg/g of extract powder. The F7 to F9 formulation series achieved better results than other formulations in various physicochemical and pharmacopoeial tests. Examination of the lack of interference between the active ingredients and the excipients using FTIR method showed that there was no interaction between them. The results of stability studies on the selected formulation showed that this formulation can have good stability under the conditions implemented.

Conclusion:

The results of this study show that all general tests, including preliminary identification and quantification of procyanidins were in line with what was stated in the US Pharmacopoeia. In view of the foregoing considerations, the F7 to F9 formulation series, and in particular the F9 formulation, can be selected as the optimum formulation for industrial scale production as well as for further studies.

Keywords:

P. eldarica, Oral capsule, Pine bark extract, Phytochemical

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Study of tyrosinase enzyme inhibitory effect of methanolic extract of *Ziziphora tenuior*(Kakuti), *Myrtus communis* (Myrtle), *Salvia rhytidea* (persian sage) as suggested antipigmentation compounds

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5-7 February 2020

Poster 121

Abstract Presenter:

Anis Ashrafzadeh

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Introduction:

Tyrosinase is a key enzyme in the biosynthesis of melanin. With regard to the public interest to skin preparations as whitening agent, and in respect to antioxidant effects of *Salvia rhytidea*, *Ziziphora tenuir* and *Myrtus communis*, in this work their inhibitory effect is evaluated against tyrosinase enzyme activity .

Methods and results:

Plant extracts were prepared with methanol 80% by maceration method. Different concentrations of the plants were evaluated for tyrosinase inhibitory effect using L-DOPA as substrate. The reaction mixture contained phosphate buffer (0.05 M, pH 6.5), mushroom tyrosinase, plant extract solution and 5 mM L-DOPA. After the addition of L-DOPA to the mixture, absorbance was read at 492 nm for dopachrome formation in different time after incubation. Kojic acid was used as a positive control. Each measurement was made in triplicate. Maximum percentage of tyrosinase inhibition (MI) determined and IC50 value was calculated.

All herbal extracts with a concentration-dependent and time-dependent effect inhibited tyrosinase activity. Maximum effect was due to *M. communis* with MI 90% (1000 µg/ml) and IC50 less than 312.5 µg/ml followed by *Z. tenuire* and *S. rhytidea* extracts.

Conclusion:

All four tested plants exhibited more than 80% inhibition of tyrosinase activity which of them, *M. communis* extract exhibited greatest activity 5 minutes after incubation and would be a good candidate for further studies. It is well known that polyphenols, and namely flavonoids, behave as inhibitors of ROS generation and could be responsible for the antimelanogenic activity of plant extracts. Moreover this activity could be attributed mainly to its high levels of total polyphenols and flavonoids. These results suggest that this plant may be helpful such as source of bioactive compounds for controlling hyperpigmentation and skin whitening agents.

Keywords:

tyrosinase inhibition, medicinal plant, *Myrtus communis*, *salvia*, *rhytidea*, *Ziziphora tenuir*

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Plant cells technology as an effective biotechnological approach for high scale production of pharmaceutical natural compounds: A meta-analysis study

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5-7 February 2020

Poster 122

Abstract Presenter:

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Introduction:

Plant cells technology is the best strategy for the production of the plant-derived drugs. This technology is proceeded using two cell types, generally, genetic- modified cells and/or genetic unmodified cells. Type 1 cells were produced by DNA modifications for production of more yielding cells. Unlike that, type 2 cells have been used with effective substrates and elicitors for high scale production of plants secondary metabolites especially natural-based drugs. Several methods have been used for high scale production of plant secondary metabolites with two mentioned cell types including cell suspensions, cell masses such as callus, hairy roots and immobilized plant cells. In cell suspension method, productive cells have been directly used. Hairy root and callus methods are used using differentiated and undifferentiated cell masses, respectively. Unlike those, immobilized plant cells have been prepared by immobilization of cells on some matrices including macromolecules such as calcium alginate, agar, carrageenan and some polymers such as polyethylene and polystyrene .

Meta-analysis:

All data for high scale production of secondary metabolites and five selected drugs (atropine, paclitaxel, vincristine, camptothecin and colchicine) were extracted and collected from peer-reviewed original articles that have been obtained from scientific journals. And data have been arranged by Microsoft Excel software. The final data were coded including: the percentages of methods and effective methods. In addition to, number of cases, amounts of all methods and outcomes have been calculated based on the obtained data and all cases have been analyzed by Neyeloff2012 method (Random-effect model)

Conclusion:

The plant cell technology is an important strategy for production of plant-based drugs. It has several advantages such as high accuracy, repeatability and productivity, then, this technology can be use instead of whole herbs. These methods should be optimized and commercialized for each natural compound.

Keywords:

High scale production, secondary metabolite production, hairy root, callus, Immobilized plant cell

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Standardization of licorice oil extract growing in South Kazakhstan

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5-7 February 2020

Poster 123

Abstract Presenter:

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Introduction:

In recent years, the popularity of herbal medicine has been increasing. Preference is given to herbal compositions that are less toxic, economically viable, have a wide spectrum of action compared to synthetic drugs. One of these plants is licorice, which has long been used in folk medicine and still does not lose its significance. Licorice species are widespread in Kazakhstan, the stocks of raw materials of which are the country's national wealth. Licorice contains a complex of biologically active substances, the main among which are triterpene saponins and flavonoids, due to which licorice preparations have a wide range of pharmacological effects.

Despite a wide range of licorice studies, its oil extract remains unstudied by the requirements of regulatory documentation. We have obtained licorice root oil extract, the main biologically active component of which is isoflavonoid glabridin. According to the literature, being a strong natural antioxidant, it protects the cells of the body from the damaging effects of free radicals, has antimicrobial, anti-inflammatory, anti-sclerotic and skin brightening effects. The aim of this work is to standardize licorice root oil extract in accordance with the requirements of regulatory documents.

Materials and methods:

In the work we used laboratory samples of an oil extract, a standard sample of glabridin (Sigma-Aldrich, No. 53633, Germany). The study of physical and chemical properties, the determination of quality indicators was carried out on 5 series of laboratory samples of oil extract by parameters: description, identification by chemical reactions, spectral characteristics, numerical indicators, density, refractive index, IR spectra were recorded on an IR-Fourier Infralum FT-08 spectrophotometer (RF), UV spectra were recorded on an SF-2000 spectrophotometer (OKB, RF) in the wavelength range of 200-400 nm. HPLC was performed on a Sykam chromatograph (Germany) equipped with a spectrophotometric detector (229 ± 2 nm) and a Reprospher C18-DE column (250x4.6 mm; 5 μ m), with a mobile phase of the composition acetonitrile - 0.1% acetic acid (70:30), under the control of the Clarity software. The speed of the flow of the mobile phase is 0.7 ml/min., the volume of the injected sample is 20 μ l. In the work, solvents and reagents of the categories "pure for analysis" and "for HPLC" were used.

Results and Discussion:

Licorice oil extract is a clear, oily liquid of light yellow color with a faint specific odor. The numerical indicators of the oil extract are determined: acid number in the range of 0.63; saponification number within 150.5; an ether number of 149.8; the average peroxide value was 0.2. Identification and quantification of the oil extract was carried out according to the main active substance glabridine. To confirm the flavonoid structure of glabridin, reactions were carried out with a solution of aluminum chloride (lemon yellow color of the alcohol layer of the solution), with iron chloride (green color of the solution).

The IR spectra of the oil extract were studied, which, according to the main maxima of the absorption bands, completely coincided with the IR spectrum of a standard glabridin sample. IR spectra are characterized by absorption bands at 1097.3 cm^{-1} (stretching vibrations of the C = O group), 1458.46; 1517.11 cm^{-1} (deformation vibrations C-H), 2917.42 cm^{-1} (stretching vibrations C = C (aromatic)), 2950.36 cm^{-1} (stretching vibrations -OH). The UV spectrum of the oil extract was studied according to glabridin, which has clear absorption maxima at wavelengths of 215, 228, and 281 ± 2 nm. Quantitative determination was carried out at a wavelength of 281 ± 2 nm. The relative error of the procedure (ϵ) was 3.32%. An HPLC technique has been developed for identification and quantification. Under the chromatographic conditions described above, the retention time of glabridin in the oil extract coincided with the retention time of a standard sample of glabridin and amounted to 5.1 ± 0.03 min. The correlation coefficient (r) of the calibration graph was 0.9996, the relative error of the procedure (ϵ) was 1.59%.

Conclusions:

The licorice root oil extract was standardized according to the main biologically active substance - glabridin. Numerical indicators are determined, identification by chemical reactions and IR spectroscopy is carried out, identification and quantification methods are developed using UV spectrophotometry and HPLC.

Keywords:

licorice oil, HPLC, quantitative determination

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Santonin substance obtaining method from *Artemisia cina*

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5-7 February 2020

Poster 124

Abstract Presenter:

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Introduction:

The territory of Kazakhstan has a huge reserve of medicinal plants, which for centuries have been widely used in traditional medicine. One of these plants is *Artemisia cina* (*Artemisia cina* Berg.), a family of Asteraceae, which have experience use in medicine and ethnopharmacy as an anthelmintic. *Artemisia cina* is an endemic plant that grows in the Turkestan region in the valleys of the Syrdarya and Arys rivers. In medicine, flower baskets (*Flores cinae*), collected at the end of budding or at the beginning of flowering, containing sesquiterpene lactone santonin, are used. Due to the chemical composition and santonin, *Artemisia cina* preparations have a wide spectrum of pharmacological action: anthelmintic, anti-inflammatory, antipyretic, hemolytic, cardiotoxic, immunomodulating, including their own antitumor activity. Purpose of the study. Development of a method for producing high purity santonin from *Artemisia cina* Berg.

Materials and Methods:

Samples of the aerial parts of the plant and flowers of *Artemisia cina* Berg., prepared during the budding and flowering phase in the Turkestan region, standard sample of santonin (Sigma-Aldrich, No. 7141956, Germany). To identify the obtained substance of santonin, an IR-Fourier Infralum FT-08 spectrometer (RF) was used. To determine the purity of santonin isolated from plant materials, TLC and HPLC methods were used. Chromatography was performed on plates for TLC "Sorbfil PTSX-AF-A-UV" (Russia) of size 15x15 and "Kizilgel-60" (Germany, Merck) size 20x20, with a mobile phase of benzene-ethyl alcohol (10: 100). HPLC was performed on a Sykam chromatograph (Germany) in a gradient mode, equipped with a spectrophotometric detector (236 ± 2 nm) and a Reprospher C18-DE column (250x4, 6 mm; 5 μ m), with a mobile phase of the composition acetonitrile - water (65:35), under the control of the Clarity software. The flow rate of the mobile phase is 1 ml/min.; the volume of the injected sample is 20 μ l.

Results and Discussion:

The preparation of santonin from the seeds of *Artemisia cina* was carried out according to the well-known Massagetov technique. According to this method, obtaining a highly purified substance of santonin from raw materials was not possible. Therefore, we have proposed a method for purifying santonin from impurities using a 5% sodium bicarbonate solution and passing a chloroform santonin solution through a silica gel column.

The structure of the obtained compound is confirmed by IR spectroscopy. In the IR spectrum, stretching vibrations are observed at 3240.14, 3422.34 cm⁻¹ ketones; 3044.80, 3077.98, 2868.58, 2731.70, 2599.82 cm⁻¹ are due to stretching vibrations of methine (C-H), methylene (CH₂) and methyl (CH₃) groups; 1752.98 cm⁻¹ is characteristic of stretching vibrations of the carbonyl group (C = O) of the γ -lactone cycle. The widened band at 1606.14 cm⁻¹ is characteristic of stretching vibrations of the C = C multiple bond located in cycle A of the eudesmanic skeleton of santonin. The absorption band at 1405.35, 1438.70 cm⁻¹ gives deformation vibrations of C-C and C-H.

On the chromatograms of the studied samples of santonin, the presence of impurities was not observed. R_f values in the range of 0.49 ± 0.02 on chromatographic plates, as well as retention time t_R in the range of 4.7 ± 0.03 min during liquid chromatography, correspond to those of a standard santonin sample.

Conclusions:

Purification of the chloroform solution of santonin with 5% sodium bicarbonate solution and column chromatography allowed us to obtain santonin with a yield of 99,70%.

Keywords:

Artemisia cina, Turkestan, chemical composition

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Application of Accelerated Solvent Extraction (ASE) Technique on the quality of *Myrtus communis* Fruit extract

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5-7 February 2020

Poster 125

Abstract Presenter:
Malihe Pourmazaheri
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Gholamreza Amin

ABSTRACT:

Myrtus communis (myrtle) is one of the most important plants used in Iranian traditional medicine. Decoction has been introduced as the most common method for myrtle extraction. This heating process might destroy certain compounds in the extract and may affect the efficacy of the plant. The Most of the literature reviews showed that the Myricetin glycosides are those phytochemicals to be considered responsible for some myrtle medicinal properties. Since polyphenolic compounds might be destroyed by high temperatures, it is necessary to find out an appropriate extraction method to increase their stability. Accelerated Solvent Extraction (ASE) is one of the novel techniques that have been developed for the extraction of phytochemicals from plants in order to shorten the extraction time, increase the extraction yield and enhance the quality of extracts. Also this technique combines elevated temperatures and pressure with a liquid solvent. To evaluate the effects of ASE on quality of myrtle extract, the plant extract was obtained by this method and compared to the extract prepared by the decoction method.

The content of Myricetin was quantified by HPLC analysis. The results showed that the yield of extraction and the quantity of myricetin in extract were significantly increased with ASE method. Based on the studies, ASE can be selected as the optimum method for myrtle extraction.

Keywords:

Extract, Accelerated solvent extraction, Myricetin

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فارماکوپه گیاهان دارویی صص: ۷۵۲-۷۴۷.
قرائتی مرضیه: بررسی اثر شربت حب‌الاس بر خونریزی زیاد رحمی. دکتری تخصصی (Ph.D.) طب سنتی دانشکده پزشکی، دانشگاه شاهد، ۱۳۹۳.

The Determination of Blood Glucose Lowering and Metabolic Effects of *Mespilus germanica L.* Hydroacetic Extract on Streptozocin-Induced Diabetic Balb/c Mice

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Abstract Presenter:

Zahra Sadrzadeh
Aghajani

*** Correspondance:**

Zahra Sadrzadeh Aghajani

Introduction:

Many medicinal plants have been recommended for the treatment of diabetes mellitus. *Mespilus germanica L.* is a large shrub or small tree common in northern forest regions of Iran that grows to a height of 2–6 m. It is a member of the Rosaceae family and has very nutritive and therapeutic usages in Iran. This research was designed to experimentally determine the serum glucose lowering, normalization animal body weight, and antioxidative stress effects of hydro acetic extract of *Mespilus germanica* leaf used in normal and streptozocin-induced Balb/c mice.

Materials and Methods:

1) collect of Plant, 2) Extract Preparation, 3) Phenols and Flavonoids Assay, 4) Animal Studies, 5) Animal Conditions, 6) Preparation of Diabetic Mice, 7) Drug Administration, 8) Experimental Design, 9) Serum Glucose Assay, 10) Glutathione and Lipid Peroxidation Assay, 11) Glutathione Assay, 12) Statistical Analysis, analysis of variance and a Student's t-test by SPSS 16.

Results:

According to the results the extract reduced the blood sugar almost in a dose-dependent manner, more evenly than metformin at doses of 100 and 200 mg/kg; however, STZ had reduced (GSH) as an indicator for oxidative stress and increased malonyl dealdehyde as an indicator for lipid peroxidation.

Conclusions:

The present study indicated that the *Mespilus germanica* leaf extract significantly decreased serum glucose and maintained normal body weight in Balb/C diabetic mice as compared with control groups. In addition, this extract decreased oxidative stress and lipid peroxidation. In conclusion, this species and other citable plants are very valuable and should be evaluated in experimental and clinical trials for their pharmacological efficacy and the discovery of new approved drugs for diabetes mellitus.

Keywords:

Flavonoids, diabetes, Rosaceae, *Mespilus germanica*, Mice

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Evaluation the effect of chronic i.p. administration of methanolic extract of aerial parts of *Marrubium parviflorum* on morphine withdrawal syndrome in male rat

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5-7 February 2020

Poster 127

Abstract Presenter:

Faezeh Hooshangi

* **Correspondance:**

Mohammad Charkhpour

Introduction:

Long-term consumption of morphine will cause tolerance and dependence. During morphine withdrawal syndrome, increasing inflammatory factors and changes in activity of the receptors. Several mechanisms (activation of NMDA receptors, oxidative stress, etc.) have been proposed to explain opioid dependence. Aerial parts of *Marrubium parviflorum* has effects on the inflammation process, anti-oxidant. So it would probably be able to reduce morphine withdrawal signs.

The aim of this study was to evaluate the effect of chronic administration of extract of aerial parts of *Marrubium parviflorum* in the development of morphine withdrawal syndrome in male rats.

Methods:

Male wistar rats were divided into seven groups randomly, including: morphine + saline (vehicle), saline + saline, and *Marrubium parviflorum* (10,20,40mg/kg) + morphine and extract 40mg/kg + saline. The rats were rendered morphine-dependent by injection of additive doses of morphine subcutaneously for 9-days. On the 9th day, 1 hour after the last dose of morphine, naloxone (4 mg/kg i.p) was injected. Withdrawal behaviors were evaluated for 60 minutes. Data were analyzed with one-way ANOVA and Tukey post-test, p values less than 0.05 were considered significant. The blood samples were then taken to measure MDA.

Results:

The results showed that *Marrubium parviflorum* could reduce the morphine withdrawal syndrome and total withdrawal score (TWS). I.P injection *Marrubium parviflorum* significantly reduced the TWS in comparison the morphine-vehicle treated group (p0.05). (20 mg/kg) of extract with (p0.01) and (40 mg/kg) of extract with (p0.001) significantly reduced TWS. MDA level was also reduced by 40mg/kg of *Marrubium parviflorum*.

Conclusion:

The results of the present study indicate that *Marrubium parviflorum* has beneficial effects in reducing withdrawal syndrome of morphine.

Keywords:

Morphine, Withdrawal syndrome, dependence, *Marrubium Parviflorum*

References:

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Chemical Preparation of Polyelactic acid containing Bismuth Nanofibers and Evaluation of Cytotoxic Effects on Normal Skin Cells

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Poster 128

Abstract Presenter:

Shabnam Salari

* **Correspondence:**

Mehdi Ranjbar

Introduction:

Nano-technology and its products are widely used in various sciences and industries and are connected to today's life. The purpose of the present study is to investigate the chemical synthesis by microwave, electrophoretic fiber production, characterization and cytotoxicity study of bismuth nano-fibers.

Methods:

Bismuth nano-particles were synthesized by direct deposition chemically by reflux and microwave radiation systems. A poly-lactic acid (PLA) nano-fibers containing bismuth was produced by electrodeposition. Proposed features of chemical bismuth nano-particles and nano-fiber are presented using scanning electron microscopy (SEM), energy dispersive X-ray (EDX), and fourier transform infrared spectroscopy (FTIR) techniques. The cytotoxicity of the produced nano-fibers on normal skin cells (SKM) and cancer cells (A375) was measured using MTT assay.

Results:

The result obtained from nano-fibers containing bismuth nano-particles showed that bismuth is located in three dimensional spaces in poly-lactic acid nano-fibers. The size of the nano-particles ranges from 80 to 100 nm and the fiber diameter is below 1000 nm. Analysis of MTT assay results showed no significant difference in A375 cell line with control. However, exposure of nano-fibers synthesized to SKM cells significantly decreased the viability of these cells.

Conclusion:

The cytotoxicity result in this study showed no toxicity in A375 cell lines and a low toxicity in the SKM, thus it is expected, and these types of synthesized nano-fibers can be used in wound healing formulation or in developing antibacterial properties in topical product. But more studies about toxicity assessment of these compounds in necessary

Keywords:

Electrospinning, Nano-fibers, Cytotoxicity, Microwave Radiation

References:

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Preparation of Bi(OH)₂/ PLA Nanofibers and Investigation of Toxicity Effects on Normal Skin Cells (HskMC) and Cancer Cell Lines (A375)

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Abstract Presenter:

Mahla Ghiasi

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Mehdi Ranjbar

Introduction:

Today, nanofibers are widely used for 3D printing and bismuth nanoparticles (Bi NPs) has become widely used in medicine. Biosynthesis of Bi NPs, production of polylactic acid incorporated Bi NPs, thier characterization, and evaluation of cytotoxic effect of synthesized nanofibers containing biogenic Bi NPs were the aims of present study design.

Methods:

Delftia sp. SFG a bismuth ion reducing bacterial strain, as an appropriate organism was selected and applied for biosynthesis of Bi NPs. Then, it was purified. PLA nanofibers containing Bi NPs were then produced by electrospinning method. Different characteristics of the PLA nanofibers containing Bi NPs were identified using scanning electron microscopy (SEM), energy dispersive X-ray (EDX), and Fourier transform infrared spectroscopy (FTIR) techniques. The cytotoxicity of the produced nanofibers on normal skin cells (HskMC) and cancer cell lines (A375) were determined using the MTT assay method.

Results:

The obtained results from nanofibers containing bismuth nanoparticles showed that bismuth is located in three dimensional space in polylactic acid nanofibers. The size of the nanoparticles ranges from 80 to 100 nm and the fiber diameter is below 1000 nm. Analysis of MTT assay results showed that exposure of synthesized nanofibers to A375 cells increased the viability of these cells. However, exposure of nanofibers synthesized to HskMC cells decreased the viability of these cells.

Conclusion:

It is expected, these types of synthesized nanofibers can be used in wound healing formulation or in developing antibacterial properties in topical product. But more studies about toxicity assessment of these compounds in necessary.

Keywords:

Cytotoxicity, Biosynthesis, Bismuth nanofibers, Delftia sp. SFG

References:

- Faramarzi M, Science AS-A in C and I . Insights into biogenic and chemical production of inorganic nanomaterials and nanostructures. *Advances in Colloid and Interface Science*.2013; 189: 1-20.
- hakibaie M, Forotanfara H, Ameri A, Adeli-Sardou M, Jafari M, Rahimi HR. Cytotoxicity of biologically synthesised bismuth nanoparticles against HT-29 cell line. *IET Nanobiotechnol*. DOI: 10.1049/iet-nbt.2017.0295.
- Ahn. S., Muna H., Lee S. Microfluidic spinning of fibrous alginate carrier having highly enhanced drug loading capability and delayed release profile. *RSC Advances*. 2015; 5: 15172-15181.

Protective effects of Taurine against Colistin-induced Nephrotoxicity

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5-7 February 2020

Poster 130

Abstract Presenter:

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Afsaneh Vazin

ABSTRACT:

Colistin (COL) belongs to the polymyxin class of antibiotics used as the last line antibiotic against drug-resistant infections. However, nephrotoxicity is the major deleterious and dose-limiting side effect associated with COL therapy. Oxidative stress and mitochondrial impairment are suspected mechanisms involved in COL-induced nephrotoxicity. Taurine is one of the most abundant amino acids in the human body with antioxidant and mitochondria protecting properties. The current study was designed to evaluate the potential nephroprotective properties of taurine against COL-associated nephrotoxicity. Mice were treated with COL (15 mg/kg/day, i.v, for 7 consecutive days) alone or in combination with taurine (500 and 1000 mg/kg, i.p). Plasma biomarkers of nephrotoxicity in addition of kidney tissue markers of oxidative stress were evaluated. Additionally, kidney mitochondria were isolated, and several mitochondrial indices were assessed. The COL-associated renal injury was evident by a significant increase in plasma markers of renal injury including creatinine (Cr), and blood urine nitrogen (BUN). COL treatment also caused a significant increase in kidney reactive oxygen species (ROS) and lipid peroxidation (LPO). Renal GSH reservoirs and antioxidant capacity were also decreased in COL-treated animals. Mitochondrial parameters including mitochondrial dehydrogenase activity, membrane potential, GSH, and ATP were significantly decreased while mitochondrial LPO, permeabilization, and GSSG content were increased in the kidney of COL-treated mice. It was found that taurine (500 and 1000 mg/kg, i.p) treatment alleviated COL-induced oxidative stress and mitochondrial dysfunction in the kidney tissue. The data obtained from the current study suggest mitochondrial dysfunction and oxidative stress as fundamental mechanisms of renal injury induced by COL. On the other hand, taurine supplementation protected kidney through decreasing oxidative stress and regulating mitochondrial function.

Keywords:

Taurine, Polymyxin, Oxidative stress, Nephrotoxicity, Mitochondrial impairment

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Protective Effect of Curcumin against Colistin-induced Nephrotoxicity

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5-7 February 2020

Poster 131

Abstract Presenter:

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Afsaneh Vazin

ABSTRACT:

Polymyxin E(PolyE) is an antibiotic used as the last line choice against drug-resistant gram-negative bacterial infections. Unfortunately, PolyE-induced renal injury is a critical clinical complication that limits drug dose and influences its therapeutic efficacy. Although the clear mechanism of PolyE-induced nephrotoxicity is far from clear, some investigations mentioned the role of oxidative stress and its associated events in this complication. Curcumin (CUR) is a phenolic compound widely investigated for its pharmacological properties. It has been well-documented that CUR is a potent antioxidant molecule. In the current investigation, the potential nephroprotective properties of CUR has been evaluated in PolyE-treated animals. Mice were treated with PolyE (15 mg/kg/day, i.v, for 7 consecutive days) alone or in combination with CUR (10, 100 and 200 mg/kg, gavage). Plasma biomarkers of renal injury, in addition to markers of oxidative stress, and kidney histopathological alterations were evaluated. PolyE caused significant renal injury as judged by a significant increase in plasma creatinine (Cr) and blood urine nitrogen (BUN). PolyE treatment also caused a significant increase in kidney biomarkers of oxidative stress, including reactive oxygen species (ROS) and lipid peroxidation (LPO). Renal GSH reservoirs and antioxidant capacity were also decreased in PolyE-treated animals. PolyE also caused interstitial nephritis, tissue necrosis, glomerular atrophy in the mice kidney. It was found that CUR (10, 100, and 200 mg/kg, gavage) treatment alleviated PolyE-induced oxidative stress and histopathological alterations in the kidney tissue. The data obtained from the current study suggest oxidative stress as fundamental mechanism of renal injury induced by PolyE. The antioxidative properties of CUR play a fundamental role in its nephroprotective properties in this study.

Keywords:

Curcumin, Colistin, Nephrotoxicity, Oxidative stress, Protection

References:

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Examination of antioxidant effect and wound healing activity of topical formulation of *Heliotropium bacciferum* extract in rat

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5-7 February 2020

Poster 132

Abstract Presenter:

Hadis Fathalipour

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Hamid Forootanfar

Introduction:

Wound healing is a dynamic process that happens in tissue under skin. Research shows a relationship between stress oxidative and wound healing, in inflammation, NOX activation is intensified which makes it to able produce excessive of ROS and finally inflammation and cellular damage is exacerbated. Also these factors make wound healing process delay. In this study, the medicinal plant which is called *Heliotropium bacciferum* has antioxidant effect and because of that and some anti-bacterial, anti-inflammatory effects, these factors make healing process happen sooner.

Materials and Methods:

The herbal plant was collected and identified by pharmacognosist. The plant was then dried and hydroalcoholic extract was prepared by maceration method. The typical phytochemical tests were done and the related topical formulation was prepared by incorporating 2.5%, 5% and 10% of the prepared extract to suitable vehicle base. The wound healing activity was investigated on rats divided into five groups of CICALFATE (standard), Sham, and three test groups of 2.5%, 5%, and 10% w/w of extract (formulation) after induction of wound. After 14 days, tissue was removed and analyzed for histopathological change and evaluation of oxidative stress. Data were analyzed using SPSS software.

Results:

In histopathological examination, the group under treatment of formulation 5% concentration is better than standard. The prepared formulation represented suitable stability and released profile.

Conclusion:

The obtained results of the present work showed suitable wound healing effect of topical formulation of *Heliotropium bacciferum* which need further investigations to found about related molecular mechanisms

Keywords:

wound healing, stress oxidative, *Heliotropium bacciferum*

References:

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Effect of a selection of skin penetration enhancers on topical anti-inflammatory effect of Boswellic acids in carrageenan-induced paw edema in rats

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5-7 February 2020

Poster 133

Abstract Presenter:

Sadaf Safaei

*** Correspondance:**

Sadaf Safaei

Introduction:

In the last decade *Boswellia* species, have become more popular for treatment of chronic inflammatory diseases. Boswellic acids (BAs) are the main active components of *Boswellia* gum and several studies have documented their anti-inflammatory effect after systemic administration. This study was aimed to evaluate the effect of some skin penetration enhancers on topical anti-inflammatory effect of boswellic acids in rats.

Methods and Results:

Male Wistar rats weighting 180-200 were used. Anti-inflammatory activity was assessed using carrageenan induced paw edema test. Boswellic acids dissolved in ethanol, propylene glycol 2%, 5% or olive oil and applied topically. Menthol, D- limonene or eucalyptus oil 0.5%, 1% were also tested as other skin penetration enhancers and applied topically 30 min prior to subplantar injection of 0.1mL of the 1% suspension of carrageenan into the right hind paw of rats. The volume of the paw was measured at 0 and 4 h after carrageenan with a digital plethysmometer and the difference was used as an index of inflammation. Piroxicam gel was used as standard drug.

Results:

A 4% etanolic solution of boswellic acids showed significant anti-inflammatory effect. 2% and 5% propylene glycol in alcohol did not change this effect. Olive oil also enhanced penetration of BAs. Menthol 0.5%, 1% and D- limonene 0.5%, 1% did not show any significant change compared to olive oil alone but BAs in eucalyptus oil 1% in olive oil showed a significantly ($P<0.001$) better anti-inflammatory effect than BAs in olive oil alone .

Conclusions:

BAs have topical anti-inflammatory effects and ethanol, olive oil alone or eucalyptus oil in olive oil can be promising vehicles for skin penetration of topical BAs.

Keywords:

Inflammation, Boswellic acids, Penetration enhancers

References:

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The protective effect of Aripiprazole on Vincristine- induced peripheral neuropathy in male rat; possible involvement of the Nitrite oxide pathway

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5-7 February 2020

Poster 134

Abstract Presenter:

Fereshteh Hasanzadeh

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Fereshteh Hasanzadeh

Introduction:

Clinical use of vincristine (VCR), an effective chemotherapeutic agent, has been limited due to its peripheral neuropathy toxicity. Aripiprazole, an antipsychotic agent, is a partial agonist of dopaminergic D2 (D2R), serotonin 5-HT1A and 5-HT7 receptors that several studies have shown that this medicine has neuroprotective and immunomodulatory properties. This study aimed to investigate the effects of aripiprazole on neuropathy-induced by vincristine in a rat model.

Methods:

Male Wistar rats were intraperitoneally injected with VCR and normal saline four times per week for 2 weeks. In the treatment group, aripiprazole (3 mg/kg) was administered intraperitoneally 30 min before VCR injection every day. Mortality rate, weight variations, and histopathological changes were monitored. Hot plate, von frey, and motor nerve conduction velocity (MNCV) tests were used to evaluate sensory and motor neuropathy. Levels of nNOS were assessed by immunohistochemistry. Moreover, the protein levels of p65 nuclear factor kappa B (NF-kappa B) in the dorsal ganglion root were examined by Western blot analysis.

Results:

Co-administration of aripiprazole with VCR significantly reversed changes in the hot plate, von frey, and sciatic MNCV induced by VCR. It also prevented mixed sensory-motor neuropathy as indicated by better general conditions, behavioral and electrophysiological results. Also, aripiprazole improved body weight loss caused by VCR. The levels of nNOS were significantly reduced in the treatment group. These findings were confirmed by western blot and histopathological analysis.

Conclusion:

In conclusion, this study showed that aripiprazole significantly reduces VCR-induced neuropathy and could be considered as a neuroprotective agent to prevent VCR-induced neuropathy.

Keywords:

Vincristine, Aripiprazole, Peripheral neuropathy, nNOS, Rat

References:

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Therapeutic effects of aripiprazole on spinal cord injury in male rats: introduction of a new treatment

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5-7 February 2020

Poster 135

Abstract Presenter:

Ali Rismanbaf

*** Correspondence:**

Ali Rismanbaf

Introduction:

Spinal cord injury is a pervasive disease that affects about 6 million people worldwide. According to the high importance of traumatic spinal cord injury as an important disabling factor, this is an important research topic and all efforts of researchers are focused on finding new ways to deal with this important issue. Although many advances in drug therapy in spinal cord injury have been achieved, however, the only methylprednisolone is widely used to treat spinal cord injury. According to studies on aripiprazole, this drug has good anti-inflammatory effects by increasing anti-inflammatory signals and inhibiting IFN-gamma. It also does not have many side effects like corticosteroids. Based on this information, the therapeutic effects of aripiprazole as a candidate for the treatment of spinal cord injury have been investigated in this study.

Methods:

The study was performed on 50 male rats weighing more than 250 g. Mice were first anesthetized with 80 mg/kg ketamine and xylazine 10 mg/kg, and 1 ml of 10% cefazolin was injected into each rat before complete anesthesia. With surgery removed the T9 vertebra and created a spinal cord injury with a vascular clip model FE716K with closing force 119g [1.17]. Then BBB, Hot Plate, Tail Flick, Von Frey tests were done on days 0 to 28 and pathological examination of spinal cord tissue performed on day 28.

Results:

Aripiprazole improved locomotor activity and reduced mechanical and thermal neuropathic pain. Also, aripiprazole decreased apoptosis and cellular damage in the pathological evaluation of spinal cord tissue. The study also found that this medicine reduced TNF-alpha levels and increased IL-10 levels and showed anti-inflammatory effects.

Conclusion:

Aripiprazole can be considered as a candidate for alternative therapy for SCI, as it reduces neurological inflammation as well as sensory and motor complications resulting from these traumas.

Keywords:

Spinal Cord Injury, Aripiprazole, locomotor activity, neuropathic pain, Rat

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The Quality of Educational Services at Isfahan School of Pharmacy: Perspective of the Students

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5-7 February 2020

Poster 136

Abstract Presenter:

Sajad Esmaeili

* **Correspondance:**

Sajad Esmaeili

Introduction:

One of the characteristics of quality in universities is to meet students' expectations of educational services. The purpose of this study was to study the viewpoints of students on the quality of educational services at the faculty of pharmacy of Isfahan University of Medical Sciences based on SERVQUAL model.

Methods:

This descriptive, comparative study was conducted in 2015-16 academic year. Research population consisted of 400 students and through random stratified sampling, 80 doctoral students (40 males and 40 females) were selected based on five different entrance years. Data were collected by means of SERVQUAL questionnaire and analyzed using descriptive statistics, Wilcoxon test, paired t-test and ANOVA.

Results:

There were gaps in all of the dimensions of educational service quality ($p < 0.001$). The highest gap mean score was in the empathy dimension (-1.62 ± 0.74) and the lowest gap mean score was related to the assurance dimension (1.09 ± 0.68).

Conclusion:

The students' expectations were far higher than their perception of the current situation at the faculty, and none of the service dimensions met their expectations. To improve this situation, authorities should prioritize the service dimensions from empathy to other dimensions.

Keywords:

Quality, SERVQUAL, Student, Educational services

References:

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Implementing Integrated Pharmacy Education for Pharmacy Students

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Abstract Presenter:
Mohamad Taklavi nezhad
*** Correspondance:**
Nasrin Maleki

ABSTRACT:

Despite the numerous changes in the pharmacy curriculum in the past few years, there's still a significant gap between graduated pharmacists' abilities and society's needs and expectations, so pharmacy education remains an important challenge in this field .

Integrated education is one of the successful methods which has been used in some parts of the world like Sunderland and Michigan university.

In this study, multidisciplinary integrated education (based on the harden ladder) is used for training pharmacy students of Tabriz University of medical sciences .

In this course, we will try to build a connection between different courses in pharmacy education that is based on real cases and solving problems in pharmacy.

Two topics including diabetes and respiratory diseases were chosen and 16 cases will be used to discuss. Teachers were chosen from different departments including pharmacology, medical chemistry, clinical pharmacy, pharmaceutics, and pharmacognosy to form an integrated way of thinking and solving problems for the student

Keywords:

Integration, harden ladder, Multidisciplinary, integrated education

References:

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The modeling of readiness assessment of Tehran pharmaceutical services centers in crisis

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5-7 February 2020

Poster 138

Abstract Presenter:

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Farzad Peiravian

Introduction:

The occurrence of various crises is always a threat to the lives of people and the development of countries. This negative phenomenon imposes huge expenses on health systems each year. Therefore, it is necessary to measure the preparedness to coping with critical situations in health systems and their subsets such as pharmaceutical sector. Experience suggests a slight disruption in pharmaceutical service providers develops and exacerbates a crisis for health systems. Therefore, the present study was conducted to design and implement a model for assessing the preparedness of pharmaceutical services centers in critical situations.

Methods:

The present study was conducted in qualitative and quantitative phases. In the qualitative phase, which involved exploratory interview with experts, the main indicators were extracted and the results were analyzed through thematic analysis. After designing an appropriate checklist and performing random sampling in five geographical areas of Tehran and with regard to five types of pharmaceutical services centers, the data was collected and analyzed by SPSS24 .

Results:

The final checklist, as the qualitative phase's output, had five dimensions and 67 indicators. The mean level of pharmaceutical services preparedness turned out 27.5% in medicine supply, 41.7% in medical devices, 55.8% in physical structure, 52% in software requirements, and 32.7% in training and human resource management. 83% of the pharmacies in medicine dimension, 61.5% in medical devices, 23% in physical structure, 28.5% in software requirements and 74% in training and human resource management were at a low or very low level of preparedness. The results of Kruskal-Wallis test showed that the geographical location of the centers did not have a significant impact on their readiness; however, the preparedness of different types of pharmacies in two dimensions of medicine supply and medical devices was significantly different.

Conclusion:

The degree of preparedness of pharmaceutical services centers in Tehran is seriously weak in all aspects. Since, such centers are not sufficiently prepared to deal with severe crises.

Keywords:

Readiness assessment, Crisis, Pharmaceutical services centers, Tehran

References:

Noe B, Smith A. Development of a community pharmacy disaster preparedness manual. *J Am Pharm Assoc.* 2013;53(4):432-7.

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Experimental Design in synthesis and labeling of a new contrast agent with high application in several imaging

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5-7 February 2020

Poster 139

Abstract Presenter:

Hakimeh Rezaei Aghdam

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Hakimeh Rezaei Aghdam

Introduction:

Over the last few decades, nanoparticles have been studied in theranostic field with the objective of exhibiting a long circulation time through the body coupled to major accumulation in tumor tissues, rapid elimination, therapeutic potential and contrast properties. In this context, we developed gadolinium-based ^{99m}Tc Labeling nanoparticles that possess in vitro efficient radio sensitizing effects at moderate concentration when incubated with cancer cells (4T1).

Methods:

In order to get the best fluorescence properties of the synthetic SiNPs, we optimized the reaction conditions by use of box benken experimental planning. Cell culture, Tumor implantation, labeling set up, Magnetic resonance imaging, Small animal injection and Statistical analysis were carried out. Also were carried Zeta potential, absorbance, particles internalization in 4T1 cells, SEM and confocal leaser scanning microscopy.

Results and Discussion:

Need of a microscopic study to understand the correlation between internalization and radiotherapy results Extracellular and radiotherapy results. The macroscopic concentration given by global chemical analysis is then no sufficient to appreciate the radio sensitizing efficiency of the particles and a GBNs classification according to their location in the cell requires observations at a smaller scale.

Keywords:

Gadolinium-Based, MRI, PET

References:

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Shahed Behzadi, Vahid Serpooshan, Wei Tao, Majd A. Hamaly, Mahmoud Y. Alkawareek, Erik. Dreaden, Dennis Brown, Alaaldin M. Alkilany, Omid. Farokhzad, and Morteza Mahmoudi. Cellular uptake of nanoparticles: journey inside the cell. Chem. Soc. Rev. 2017., 46, 4218.

Experimental Design in synthesis and labeling of a new contrast agent with high application in several imaging

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Poster 140

Abstract Presenter:

Hakimeh Rezaei Aghdam

*** Correspondance:**

Hakimeh Rezaei Aghdam

ABSTRACT:

Over the last few decades, nanoparticles have been studied in theranostic field with the objective of exhibiting a long circulation time through the body coupled to major accumulation in tumor tissues, rapid elimination, therapeutic potential and contrast properties. In this context, we developed gadolinium-based ^{99m}Tc Labeling nanoparticles that possess in vitro efficient radio sensitizing effects at moderate concentration when incubated with cancer cells (4T1). Methods: We optimized the reaction conditions by use of box benken experimental planning. Cell culture, Tumor implantation, labeling set up, Magnetic resonance imaging, Small animal injection and Statistical analysis were carried out. Also were carried Zeta potential, absorbance, particles internalization in 4T1 cells, SEM and confocal leaser scanning microscopy. Results and Discussion: Need of a microscopic study to understand the correlation between internalization and radiotherapy results Extracellular and radiotherapy results. The macroscopic concentration given by global chemical analysis is then no sufficient to appreciate the radio sensitizing efficiency of the particles and a GBNs classification according to their location in the cell requires observations at a smaller scale.

Keywords:

Gadolinium-Based, experimental design, radiolabeling nanoparticles, box benken

References:

Shahed Behzadi, Vahid Serpooshan, Wei Tao, Majd A. Hamaly, Mahmoud Y. Alkawareek, Erik. Dreaden, Dennis Brown, Omid. Farokhzad, and Morteza Mahmoudi. Cellular uptake of nanoparticles: journey inside the cell. Chem. Soc. Rev. 2017., 46, 4218.

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The Impact of Time on Motivation of Pharmacy Students at Tehran Azad University

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Poster 141

Abstract Presenter:

Ali Rismanbaf

* **Correspondance:**

Ali Rismanbaf

Introduction:

Motivation is one of the most important factors of active, independent, and self-centered learning. Humans have interests, goals, and preferences that serve as role models for each individual's efforts and help us to direct our efforts toward our goals. Given the importance of motivation and its role in student success and efficiency and the effect of the university on it, we decided to conduct a study on first, second, tenth and eleventh-term pharmacy students of Tehran Azad University to evaluate the effect of time on their motivation by questionnaire.

Methods:

The present study was a questionnaire-based study conducted in 2018 on pharmacy students of Islamic Azad University of Tehran. The statistical population of this study consisted of 180 pharmacy students, 86 of whom were first and second term students and 94 of them were tenth and eleventh term students. The questionnaire also included 14 questions that measured hope for the future of pharmacy, satisfaction with pharmacy, interest in pursuing education, a favorite post-graduate work area, and students' willingness to participate in student activities.

Results:

The data showed that tenth and eleventh term students tend to pursue Pharmacy, research, student activities, applied theses, and work in a variety of pharmacy fields, excluding working in the drugstore, significantly decreased compared to first and second term students.

Conclusion:

According to the results, the motivation of Pharmacy students in the tenth and eleventh term is significantly lower than the first and second term students. The study of its causes requires further study.

Keywords:

Motivation, pharmacy student, Time pass

References:

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Effects of crude extract of green prevalent algae rural variety on *Cutaneous Leishmaniasis* in Yazd city

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Poster 142

Abstract Presenter:

Mojde rahmani

* **Correspondance:**

Hamidreza jamshidi

Introduction:

Leishmaniasis is one of the infectious diseases in the world including Iran. The First line of treatment is pentavalent antimonials, that are potentially toxic, not so effective and cause long term side effects. Besides, they do not shorten the wound healing process. The second compounds often used, include pentamidine and amphotericin B, which they may be toxic or ineffective in some area. Therefore, the need for new, natural and effective compounds for the treatment of the disease caused by Leishmania has received worlds attention in recent years. Green algae species are good sources of bioactive metabolites with a wide range of biologic effects and in recent years.

Streams of Yazd have rich sources of green algae. The aim of this study was to investigate the anti-leishmanial activity of a crude extract of the common green algae species in Yazd on cutaneous leishmaniasis of rural areas in the culture medium.

Materials and Methods:

pured and enough cultures were isolated form Leishmania. J. Green algae extracts were prepared in different concentrations. The growth and life of parasite were evaluated by adding different concentrations of Green algae extract by XTT method and then analyzed by Elisa.

Results:

According to the results dose-dependent decrease detected on variety on Cutaneous Leishmaniasis using different levels of Glucantime and hydroalcoholic extracts of green prevalent algae (P0.05

Conclusion:

These results suggest green prevalent algae had medical potential similar to the Glucantime.

Keywords:

Green prevalent algae, Leishmaniasis, Antileishmanial activity

References:

Fouladvand M, Barazesh A, Farokhzad F, Malekizadeh H, Sartavi K. Evaluation of in vitro anti-Leishmanial activity of some brown, green and red algae from the Persian Gulf. Eur Rev Med Pharmacol Sci. 2011;15: 597-600

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A new approach on lithium-induced neurotoxicity using rat neuronal cortical culture: Involvement of oxidative stress and lysosomal/mitochondrial toxic Cross-Talk

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Abstract Presenter:

Nasim Akbarizadeh

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Jalal Pourahmad

ABSTRACT:

Lithium (Li) is a widely-used medication for the treatment of patients with bipolar disorder. This well-known medication causes different complications. One of the most important adverse effects of Li is neurotoxicity. Neurotoxicity is usually irreversible and may lead to more serious health problems. The symptoms of Li-induced neurotoxicity include tremor, delirium, drowsiness, ataxia, muscle weakness and twitching, slurred speech, psychomotor slowing, disorientation, seizures, coma and death. In this study, we wanted to evaluate the exact sub-cellular and molecular mechanisms of Li-induced neurotoxicity.

For this purpose, we used primary neuronal cortical culture for investigating lithium-induced neurotoxicity. The primary neuronal culture has a lot of benefits. The greatest advantage of primary nerve cell culture is that it makes living neurons immediately accessible to observation and manipulation. So, the postnatal rat pups were used for isolating the cortical neurons. We evaluated neural viability, neural reactive oxygen specious (ROS), lipid peroxidation, mitochondrial membrane potential (MMP), lysosomal membrane integrity (LMI), and reduced (GSH) and oxidized (GSSG) glutathione.

Our results demonstrated that the cytotoxic effect of Li has interceded through lysosomal membrane leakage associated with ROS generation and reduction of MMP before cell lysis started. Incubation of isolated neurons with Li also caused rapid GSH depletion (as GSSG efflux) as another marker of cellular oxidative stress .

We concluded that Li causes neurotoxicity in a dose-dependent manner. Furthermore, Li-induced neurotoxicity is a result of the generation of ROS and lipid peroxidation that leads to mitochondrial/lysosomal toxic cross-talk.

Keywords:

Lithium, Neurotoxicity, neuronal cortical culture, Mitochondria, lysosome

References:

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Chrysin Induces Apoptosis via Mitochondrial Pathway and ROS Formation in Human Glioblastoma Cells

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Abstract Presenter:

Mohammad Reza Neshat

* **Correspondance:**

Jalal Pourahmad

ABSTRACT:

Glioblastoma is the most lethal brain tumor with poor prognosis which possesses a high resistance against anticancer drugs. Chrysin is a flavonoid compound that can inhibit proliferation and invasion of various human cancer cells. In this study, we investigated the cytotoxic effect of chrysin against brain mitochondria from human glioblastoma cells. Mitochondria were obtained by differential ultracentrifugation and incubated with different concentrations of chrysin. The activity of mitochondrial complex II was assayed via the measurement of MTT reduction. The mitochondrial ROS measurement was performed using the fluorescent probe DCFH-DA. The Rhodamine 123 (Rh 123) redistribution technique was used for MMP measurement. Mitochondrial swelling was measured spectrophotometrically in duration 1 hour. Caspase-3 activity was evaluated using the Sigma caspase-3 assay kit. Data were analyzed using the Graph pad prism software, version 7. Our results demonstrated that chrysin induced a rise in mitochondrial reactive species (ROS) formation and mitochondrial membrane potential (MMP) collapse before mitochondrial swelling ensued in isolated brain mitochondria. In addition, collapse of MMP and mitochondrial swelling produced release of cytochrome c via outer membrane rupture or mitochondrial permeability transition (MPT) pore opening. Furthermore, caspase-3 activity was significantly increased in cells isolated from the brain when incubated with chrysin. The present study concluded that chrysin could be a suitable candidate for investigating of new herbal anticancer drugs. However, it requires a further in vivo and clinical studies.

Keywords:

Anticancer, Apoptosis, Chrysin, Glioblastoma, Mitochondria

References:

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Study of the Effect of Dichlorvos Toxicity on Formalin Induced Pain in Male Mice

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5-7 February 2020

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Abstract Presenter:
Elyar Azimi Zangabad
*** Correspondance:**
Elyar Azimi Zangabad

Introduction:

Organophosphorus compounds are widely used in agriculture and pest control in the environment which can be highly toxic. The aim of this study was to determine the toxicity effect of dichlorvos on formalin-induced pain in male mice.

Methods and Results:

In this study, 70 male NMRI mice were used (7 groups and 10 mice in each group). The first group received drinking water + plantar normal saline, the second group received free water + plantar formalin, the third, fourth, fifth, sixth and seventh groups received dichlorvos (20 mg/kg) orally in drinking water + Formalin respectively for one, two, three, four and five weeks. Plantar subcutaneous injection of formalin 5% was used in order to induce pain and inflammation. Duration of licking and biting of the injected foot were recorded at intervals of 5 minutes to an hour by a chronometer.

Plantar injection of normal saline in the control group caused a significant pain ($p < 0.05$) only in the first five minutes. Plantar injection of formalin in normal rats caused a significant pain ($p < 0.05$) at first, fourth, fifth, sixth, seventh and eighth 5 minutes. formalin produces a two-stage pain (the first phase: 0-5 min and the second phase: 15-40 min after injection). Dichlorvos increase significantly the first phase of formalin-induced pain ($p < 0.05$), whereas decreased the second phase of pain significantly ($p < 0.05$).

Conclusion:

Dichlorvos increase significantly the first phase of formalin-induced pain, whereas decreased the second phase of pain significantly. But, the proof of this claim that dichlorvos has an anti-inflammatory effect needs further studies in other species and humans

Keywords:

Dichlorvos, formalin-induced pain, organophosphorus, mice

References:

- Kerem, M., Bedirli, N., Gurbus, N., Ekinci, O., Bedirli, A., Akkaya, T., Sakrak, O. and Pasaoglu, H. Effects of acute fenthion toxicity on liver and kidney function and histology in rats. *Turk. J. Med. Sci.* 37: 281-288; (2007)
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Pulmonary protective effects of vitamin D & N-acetylcysteine on paraquat-induced toxicity through modulating reactive oxygen species

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5-7 February 2020

Poster 146

Abstract Presenter:

Zahra Azizi

* **Correspondance:**

Akram Ranjbar

Introduction:

Paraquat (PQ) is one of the most common herbicides used in agriculture, which can cause very severe toxicity in humans and animals. The most important tissue for destructive effect of PQ is lung tissue. In this study, we investigated the effect of N-acetyl cysteine (NAC) and Vitamin D (Vit D) on the oxidative toxicity of lung tissue in subacute toxicity with PQ.

Materials and Methods:

36 male albino Wistar Rats 8 weeks were randomly divided into 6 groups (n=6). Control and Poisoned with PQ (5mg/kg) groups treated with or without Vit D (2 µg/kg) or NAC (6.25 mg/kg) for 7 days. Lipid peroxidation (LPO), total oxidant status (TOS), total antioxidant capacity (TAC), total thiol groups (TTG) and hydroxyproline levels in lung tissue by spectrophotometric methods were evaluated. Also, histopathological evaluation of lung tissue was performed.

Results:

PQ caused a significant increase in the levels of LPO, TOS and hydroxyproline and lung tissue damage, and decreased significantly TAC and TTG levels. In treated groups, in comparison with the PQ group LPO, TOS, hydroxyproline and lung tissue damage were significantly decreased, while TAC and TTG increased significantly.

Conclusion:

Vit D and NAC can play a protective role in reducing the oxidative stress and lung tissue damage induced by PQ.

Keywords: Paraquat, N-acetyl cysteine, Vitamin D, Lung, Oxidative stress

Keywords:

Paraquat, N-acetyl cysteine, Vitamin D, Lung, Oxidative stress

Mitochondrial Impairment Contributes to Cardiotoxicity Induced by Ciprofloxacin

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5-7 February 2020

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Abstract Presenter:

Farahnaz Tanbakousazan

* **Correspondance:**

Jalal Pourahmad

ABSTRACT:

Ciprofloxacin belongs to the fluoroquinolones, and is commonly used in both human and veterinary medicine because of its strong antibacterial activity. Ciprofloxacin have cardiovascular toxic effects in humans. It has been observed that the heart is more susceptible to ROS generation due to mitochondrial dysfunction. This is possibly due to high levels of mitochondria in the heart which are the major producers of ROS. For that reason, we decided to explain the mechanisms of ciprofloxacin induced cardiotoxicity by using mitochondria isolated from rat heart. Rat heart mitochondria were obtained by differential ultracentrifugation and incubated with different concentrations of ciprofloxacin (10, 20 and 40 μ M). The activity of mitochondrial complex II was assayed via the measurement of MTT reduction. The mitochondrial ROS measurement was performed using the fluorescent probe DCFH-DA. The Rhodamine 123 (Rh 123) redistribution technique was used for MMP measurement. Mitochondrial swelling was measured spectrophotometrically in duration 1 hour. Our results demonstrated that ciprofloxacin induced mitochondrial dysfunction via an increase in mitochondrial reactive oxygen species (ROS) production, mitochondrial membrane potential (MMP) collapse, mitochondrial swelling and damage in the mitochondrial outer membrane (MOM) which is associated with the cytochrome c release. These findings suggested that ciprofloxacin induced cardiotoxicity is the result of a disruptive effect on the mitochondrial respiratory chain and induction of ROS-mediated apoptosis signaling in heart cardiomyocytes.

Keywords:

Mitochondria, ROS

References:

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Toxicity of ciprofloxacin on isolated skeletal muscle mitochondria: using both in vivo and in vitro methods

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5-7 February 2020

Poster 148

Abstract Presenter:

Mohammad Reza Neshat

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Jalal Pourahmad

ABSTRACT:

Ciprofloxacin is a second-generation fluoroquinolone antibiotic commonly used in therapy of many microbial infections. Rhabdomyolysis is one of the serious side effects of ciprofloxacin. The use of ciprofloxacin is associated with a risk of myopathy particularly in patients taking statins, but the mechanisms underlying is poorly known. In this study, experiments were divided into two parts: using in vivo methodology, doses of ciprofloxacin at 200, 400, 600 mg/kg were administered orally to mice daily for 21 to obtain skeletal muscle mitochondria; and utilizing in vitro methodology, skeletal muscle mitochondria were incubated with ciprofloxacin at 35, 70 and 140 μ M concentrations. Subsequently, the toxic effects of ciprofloxacin on skeletal muscle was assessed using mitochondrial dysfunctions tests, including complex II activity, reactive oxygen species formation, mitochondrial membrane potential collapse, mitochondrial swelling and cytochrome c release. Our results from both in vivo and in vitro experiments on isolated skeletal muscle mitochondria showed a significant rise in mitochondrial reactive species (ROS) formation and ensued in isolated skeletal muscles mitochondria. In addition, collapse of MMP and mitochondrial swelling produced release of cytochrome c via outer membrane rupture or mitochondrial permeability transition (MPT) pore opening. According to the results, we suggested that ciprofloxacin-induced myopathy is the results of a disruptive effect on mitochondrial respiratory chain and induction of ROS-mediated apoptosis signaling in skeletal muscle cells.

Keywords:

Ciprofloxacin, myopathy, mitochondria, ROS, toxicity

References:

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Evaluation of carbon dots cytotoxicity in drug delivery system

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5-7 February 2020

Poster 149

Abstract Presenter:

Elham Rashidi

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Neda Esfandiari

Introduction:

Carbon dots are fluorescent nanoparticle with the wide range of potential applications such as the biological imaging and targeted drug delivery in cancer therapy. Carbon dots as the fluorescence probes were entered into cancer cells via receptor-mediated endocytosis and acted as a carrier for delivering drugs, but the several findings have indicated that the toxicity of these carbon dots are a main concern. Green carbon dots have a low cytotoxicity and high biocompatibility as well as different functional groups on their surface which are beneficial for cancer cells targeting in drug delivery.

Material and Methods:

The green fluorescent carbon dots were synthesized by a facile hydrothermal method. The cytotoxicity potential of green carbon dots was evaluated on SKBR3 cell line. The cells were seeded into 96-well plates with a density of about 1×10^4 cells per well. After 24h the culture medium was replaced with medium containing carbon dots at various concentrations. Next, we studied the cytotoxicity of carbon dots using MTT colorimetric assay. The absorbance of wells was measured with microplate reader instruments at 570 nm.

Results:

The MTT assay is widely used to study proliferation and cytotoxicity. In this study, SKBR3 cell viability was not significantly changed with various concentration after 24h incubation by MTT assay. Conclusion: In summary, green carbon dots with the bright fluorescent have low cytotoxicity and high compatibility with the cells. Green carbon dots demonstrate the promising potential ways in biolabeling, bioimaging, and biomedical applications instead of using the chemical material in cancer.

Keywords:

SKBR3 cell line, green carbon dot, drug delivery, cancer cells

References:

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Toxicity of Atenolol and Propranolol on rat heart Mitochondria

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5-7 February 2020

Poster 150

Abstract Presenter:

Yasaman Tabbati

* **Correspondance:**

Jalal Pourahmadjaktaji

Introduction:

beta adenergetic antagonists are prescribed for several different conditions including high blood pressure, angina, some abnormal heart rhythms, heart, anxiety, migraine, glaucoma and overactive thyroid symptoms. based on many clinical reports beta blockers cause damaging effects on heart myocardial tissue due to their negative inotropic and chronotropic adverse effects. but the mechanisms responsible for beta blockers induced cardiotoxicity has not yet been elucidated. in this research, we therefore decided to investigate the mechanisms of atenolol and propranolol cardiotoxicity by using isolated rat heart mitochondria.

Methods:

we isolated mitochondria from rat heart using ultra centrifugation technique. the isolated heart mitochondria were incubating with different concentrations of atenolol and propranolol (5, 10, 20 micromolar). mitochondrial oxidative stress toxicity parameters were then evaluated.

Results:

results showed that atenolol and propranolol induced mitochondrial dysfunction via an increase in mitochondrial reactive oxygen species (ROS) production, (MOM) which is mitochondrial with the cytochrome c release. our results showed that decrease of mitochondrial ATP level, an indicator of disturbance in oxidative phosphorylation. atenolol and propranolol also increase the caspase 3 activity.

Conclusion:

according to our results, we suggest that atenolol and propranolol induced cardiotoxicity is the result of a disruptive effect on the mitochondrial respiratory chain and induction of ROS mediated apoptosis signaling in heart cardiomyocytes

Keywords:

Atenolol, propranolol, ROS, heart mitochondria, apoptosis

References:

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Construction of an Expression Vector of Mycobacterium Tuberculosis Antigens as Recombinant Protein Vaccine Candidate

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5-7 February 2020

Poster 151

Abstract Presenter:

Zahra Bagheri

* **Correspondance:**

Zahra Bagheri

ABSTRACT:

Prevention of tuberculosis (T.B) through vaccination would reduce the global T.B burden. Despite using the available BCG (Bacille Calmette Guerin) vaccine that is easy and cheap to produce, it is not effective enough. So T.B is still a worldwide disease that kills 2-3 million people each year. A subunit vaccine called Mtb 72F applied in human clinical trials. Mtb72f safety and efficiency showed in clinical trials. In this study we have constructed an expression vector that contains the Mtb 72F fragment with some new modifications.

In this experimental study, rv0125C and N terminals fragments were amplified by polymerase chain reaction (PCR) using specific primers and inserted into pET21b plasmid. Rv1996 amplified by PCR and inserted between C and N terminal fraction of rv0125 in recombinant vector. Colony-PCR, restriction enzyme analysis, and DNA sequencing were employed to confirm the accuracy of the cloning. We used Western blot to verify the desired protein expression.

The amplified fragments indicated the desired size in PCR and digestion methods, and protein expression was confirmed using monoclonal antibody. Our modification made it possible to insert another gene or gene fragments into the Mtb72F vector for developing new constructs. Furthermore, our data has demonstrated that the placement of the histidine tag in the carboxyl- (C-) or amino- (N-) terminal part of a protein may influence protein stability.

Keywords:

Mycobacterium tuberculosis, vaccine, rv0125c, Mtb72F

References:

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Methotrexate-Loaded thermos-sensitive boronated Nanoparticles: Preparation, Characterization and their Cytotoxicity Effect on Human Glioblastoma U87MG Cell

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5-7 February 2020

Poster 152

Abstract Presenter:

Monireh Soleiman-beigi

* Correspondance:

Monireh Soleiman-beigi

Introduction:

Glioblastoma Multiform (GBM) is considered as the most common and lethal primary brain tumor as well as the most malignant neoplasm of the astrocytic regions, accounting for 15% of all primary brain tumors, about 50- 60% of all astrocytoma and 60 to 70% of malignant gliomas. Despite advances in the treatment of GBM, the median survival of patients has not been changed significantly. The purpose of the current study was to synthesize thermos-sensitive boronated CS-NPs, prepare Methotrexate (MTX) loaded TRC-NPs and investigate their toxicity effect on human glioblastoma cells (U87MG).

Methods and Results:

At the first to improve the thermos responsivity of chitosan, poly (N-isopropylacrylamide) was applied to modification. In the second step, to modify the water solubility, Succinic acid moieties were grafted onto the CS. To make the targeted system, BPA-BOC₂O was attached to the main body of the CS. The FT-IR and NMR spectra confirmed the structure of modified systems. MTX loaded CS-NPs were prepared by a direct dialysis cellulose membrane method. The quantity of MTX loaded was studied by UV spectrophotometer at 304 nm. The MTX loading in NPs corresponding to the optimal conditions was about 100 %. The release profile of BPA from NPs following a temperature monitoring at higher than LCST (39 °C) of systems studied by UV was about 100% after 12hr. The influence of different experimental parameters including polymer concentration and drug concentration on the particle size was evaluated. The size and zeta potential of prepared bare and MTX loaded nanoparticles determined by DLS, SEM and TEM methods were 95 to 127nm. Differential Scanning Calorimetric (DSC) results indicated thermal stability of prepared systems. Moreover, in vitro Cytotoxicity studies revealed that the cell Cytotoxicity effect of MTX loaded (passive and active) TRC-NPs on U87MG cells was more than free MTX. The cell uptake studies of curcumin loaded TRC-NPs were confirmed by flowcytometry on U87MG and A-431 cells.

Conclusion:

The results of this study are promising to introduce a novel formulation of a highly stable boronated TRC-NPs of MTX could be considered as potential candidate for drug delivery in the treatment of glioblastoma.

Keywords:

Chitosan, Thermo-Sensitive, NPs, 4-Boron-L-Phenylalanine (BPA), Methotrexate, Glioblastoma

References:

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 Kamali M, Dinarvand R, Maleki H, Arzani H, Mahdavi P, et al. Preparation of imatinib base loaded human serum albumin for application in the treatment of glioblastoma. *RSC Adv* 2015; 5: 62214-62219.

Synthesis and in-vitro evaluation of thermo-sensitive boronated chitosan-poly (N-isopropylacrylamide) nanoparticles as a novel drug delivery system to use in BNCT

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5-7 February 2020

Poster 153

Abstract Presenter:

Monireh Soleiman-beigi

*** Correspondance:**

Monireh Soleiman-beigi

Introduction:

High-grade gliomas, and more specifically glioblastoma multiform (GBM), are uniformly fatal and have no curative treatment. An almost inevitable glioma recurrence is due to the persistence of these cells. The high linear energy transfer associated with BNCT could kill quiescent and proliferative cells. BNCT is a binary and targeted therapy in which cancer cells accumulate ¹⁰B and are subsequently irradiated with neutrons. This absorption reaction results in high linear energy transfer production of ⁴He and ⁷Li nuclei. In order to be successful, a sufficient amount of ¹⁰B must be selectively delivered to the tumor. The most important purpose of the study is to synthesize boronated CS-NPs which can deliver a high boron payload into glioma cells (U87MG) in BNCT.

Methods and Results:

At the first to improve the thermos responsivity of chitosan, poly (N-isopropylacrylamide) was applied to modification. In the second step, to modify the water solubility, Succinic acid moieties were grafted onto the CS. To make the targeted system, BPA-BOC₂O was attached to the main body of the CS. The FT-IR and NMR spectra confirmed the structure of modified systems. BPA loaded CS-NPs were prepared by a direct dialysis cellulose membrane method. the quantity of BPA loaded was studied by UV spectrophotometer at 260 nm. The quantity of BPA loaded in NPs was about 100 %. The release profile of BPA from NPs following a temperature monitoring at lower and higher than LCST (39 °C) of systems studied by HPLC was about 100% after 12hr. The size and zeta potential of prepared bare and BPA loaded nanoparticles studied by DLS, SEM and TEM methods were 95 to 119nm. The thermal stability of prepared systems was investigated by DSC. Cytocompatibility of (active and passive) TRC-NPs on an array of cell line was proved by MTT assay. The cellular uptake studies of curcumin loaded TRC-NPs were confirmed by flowcytometry on U87MG and A-431cells.

Conclusion:

The BPA release follows a diffusion-controlled mechanism. Our preliminary study thus providing clear evidence for the successful preparation of BPA loaded with novel and highly stable boronated thermo-sensitive chitosan-poly (N-isopropylacrylamide) NPs to BNCT studies.

Keywords:

Chitosan, Thermo-Sensitive, NPs, 4-Boron-L-Phenylalanine (BPA), Boron Neutron Capture Therapy, BNCT

References:

- Sun T, Zhang Z and et al. BNCT induces cell cycle arrest and cell apoptosis of glioma stem/progenitor cells in vitro. *Radiation Oncology* 2013; 8:195.
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- serum albumin for application in the treatment of glioblastoma. *RSC Adv* 2015; 5: 62214-62219.

Evaluation of Mouse Fetus Liver Development with FTIR Spectroscopy During the Pregnancy

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5-7 February 2020

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Abstract Presenter:

Golrokh Farnam

* **Correspondance:**

Farshad.H.Shirazi

Introduction:

Teratology is the study of gross structural malformations that are observable before or after birth and can be caused by variable reasons. Most of these studies have been performed as histological and pathological studies. FTIR is now widely used in various fields of biology; it has shown promise as a sensitive diagnostic tool to distinguish tissues and organs from each other, for example, neoplastic from normal cells in cancers such as the colon.

In this study, we observed biochemical changes in liver FTIR spectra during the pregnancy so that we can obtain a normal spectral template of the fetus spectra for teratology studies as well as fingerprint region.

Methods and Materials:

Pregnant mice were used in this study, the fetuses were dissected on day 11, 12, 13, 14, 15 of gestation and then fixed by fixative solution, embryos were then dehydrated, ethanol substitution and embed with paraffin, paraffin blocks were cut and spectroscopy on the fetus organ liver is done by the FTIR spectroscopy. Preprocessing and data analysis were done using PCA methods on the MATLAB software.

Results:

PCA was used to analyze results as unsupervised routine. Results of PCA analysis indicate that the spectra obtained from the liver on different days can be separated and we can follow the liver development. 93% of the data were included in the PCA and analyzed according to the first two components with the pattern of 80% for PC1 13% for the PC2.

Conclusion:

FTIR spectroscopy and its combination with mathematical analysis techniques can be used to evaluate the development of different organs of the mouse fetus during the pregnancy.

Keywords:

FTIR, fetus, mouse, embryology

References:

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Comparison of protein expression pattern in cisplatin sensitive and resistant ovarian cancer cell lines before and after the treatment with cisplatin using two dimensional gel Electrophoresis

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5-7 February 2020

Poster 155

Abstract Presenter:

Kamyar Keshavarz Farajkhah

*** Correspondance:**

Farshad.H. Shirazi
Maryam Tabarzad

Introduction:

Ovarian cancer is the most fatal gynecological cancer and the 8th most prevalent type of cancer in Iran. Platinum agents and paclitaxel combination is the first choice chemotherapy regimen. The major problem during the treatment with cisplatin is the appearance of acquired resistance in cancer cells. This resistance drops the 5-year survival of patients suffering ovarian cancer, from 45% to 31%. (3) Owing to inefficacy of second line regimens, it seems necessary to find out the molecular mechanisms of cisplatin resistance, in order to find an efficient strategy against the resistant cancer cells. The aim of this study was to evaluate the difference between protein expression profiles of ovarian cancer cell lines with various level of resistance to cisplatin using two dimensional gel electrophoresis. In this study, a cisplatin-sensitive ovarian carcinoma cell line and four cisplatin-resistant ovarian carcinoma cell lines with gradual increase in their resistance have been used. For each cell lines, cultured cells were divided in two groups of control and treatment and after protein extraction, the protein expression profiles were investigated. Image analysis and comparison was done by Samespot® software using one-way ANOVA for detection of differences in protein expression profiles. Evaluation was based on the comparison of expression patterns in two ways. In the first way, the patterns of cisplatin-resistant cell lines were compared with cisplatin-sensitive cell line in control groups. In the second way, the patterns of cisplatin-resistant cell lines were compared with cisplatin-sensitive cell line in treatment groups. At least 500 proteins were detected in each gel. Based on the three mentioned ways of evaluation, a protein was identified to have a key role in the emergence of cisplatin resistance. The change in the expression of this protein had a linear relationship with the cisplatin resistance. The relative expression changes for the protein were 1.4, 1.5, 1.7 and 2 respectively for A2780-R1, A2780-R2, A2780-R3 and A2780CP in the first way of comparison and 2.4, 3.1, 6 and 7.8 respectively for A2780-R1, A2780-R2, A2780-R3, and A2780CP in the second way. The predicted pI and MW were 4.9 and 11 kD respectively.

Keywords:

Cisplatin, two dimensional gel electrophoresis, drug resistance, ovarian cancer

References:

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Cortez AJ, Tudrej P, Kujawa KA, Lisowska KM. Advances in ovarian cancer therapy. Cancer chemotherapy and pharmacology. 2018 Jan 1;81(1):17-38.
Amable L. Cisplatin resistance and opportunities for precision medicine. Pharmacological research. 2016 Apr 1;106:27-36.

Agonist and antagonist effect of Clonidine, Idazoxan, Fluphenazine, Clozapine, and Chlorpromazine in α 2A adrenergic receptor

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5-7 February 2020

Poster 156

Abstract Presenter:

Majid Vahed

*** Correspondance:**

Majid Vahid

ABSTRACT:

α 2A-adrenergic receptor (α 2AAR) antagonist treatments are effective in reducing A β generation and Alzheimer's disease (AD) related pathology. Endocytic sorting of amyloid precursor protein (APP) interfered by the vacuolar protein sorting (Vps10) family of receptors represents a crucial role in regulating the outcome of APP proteolytic processing and A β generation. In confirmation, the role of receptor activity in this process, by inactivation of α 2AAR using clinically-used α 2AR antagonist, idazoxan, reduces the competitive interaction of APP-SorLA and improves the clinical symptoms of a mouse model of the AD. The data obtained is significant as showed that α 2A adrenergic receptor in an activity-dependent manner, disrupt the interaction of the APP-SorLA complex by which may regulate multiple downstream signaling effectors and will modify the APP and/or SorLA and consequently, increases the formation of amyloid-beta (A β) peptides and worsen AD. Previously we showed A β peptide with 42 residues in sequence in the presence or absence of Fe²⁺ and Fe³⁺ ions, The data obtained in this research significant showed that Clonidine connected to the active site in case of less than -3 binding energy score (agonist), whereas idazoxan play as the antagonist, idazoxan able to connection allosteric and active site of α 2A adrenergic receptor alternatively. Idazoxan, with binding to the allosteric site of α 2A adrenergic receptor, can cause agonist activity. Fluphenazine connected to the active site in case of less than -3 binding energy score, whereas Clozapine/Chlorpromazine play as the regulation, and able to connection allosteric and active site of α 2A adrenergic receptor alternatively. Clozapine and Chlorpromazine with binding to the allosteric site of α 2A adrenergic receptor can cause the agonist activity. The docking result is shown Fluphenazine is more specific than Clozapine/Chlorpromazine but less sensitivity than Clozapine/Chlorpromazine (in less than -3 binding energy score). 2- Interestingly, Fluphenazine bind to the active site of α 2AAR, but Clozapine/Chlorpromazine can bind to an allosteric site and binding site in a case of high affinity (in less than -3 binding energy score). 3- Loops between Helix domains 4-5 and 6-7 were critical residues for ligand binding. 4- The docking result shows clonidine is more specific than idazoxan but less sensitive than idazoxan. 5- Interestingly, clonidine just binds to the active site of α 2AAR, but idazoxan can bind to an allosteric site, and binding site in a case of high-affinity 6-Loops between Helix domains 4-5 and 6-7 were critical residues for ligand binding. Those components with binding to the active and allosteric sites can cause an effect in the agonist and antagonist activity or no activity of the α 2A adrenergic receptor. These components, by binding to the active site or allosteric site, can cause Agonist and antagonist activities or no activity on α 2A adrenergic receptor.

Keywords:

α 2A adrenergic receptor; amyloid beta, Clonidine, Idazoxan, Fluphenazine, Clozapine, and Chlorpromazine, computational biology

References:

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High throughput Purification of a Novel Anti-TNF- α Single Chain Antibody Fragment and Evaluation of its Diagnostic Properties

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5-7 February 2020

Poster 158

Abstract Presenter:

Morteza Shahmirzaie

*** Correspondance:**

Farshad H. Shirazi

Introduction:

Tumor necrosis factor- α (TNF- α) is a homo-trimeric cytokine that plays a key role in mediating inflammation. Anti-TNF- α antibodies are being used in clinic for the purpose of diagnosis and treatment due to their high specificity. Antibody purification involves steps employed in the separation of the target protein from the protein mixture. Purification processes have to be designed to target the highest purity product at the highest yield, and the minimum costs. In this study, we performed high throughput purification of Anti-TNF- α scFv that we had previously isolated by phage display technique and then examined the ability of this purified scFv in the detection of TNF- α in the blood serum of patients with inflammatory diseases and also the immunological detection limit of purified antibody was determined by antigen coated plate (ACP)-ELISA.

Material and Methods:

The TNF- α scFv cassette was transformed to E. coli strain XL1-Blue. The fresh inoculum of transformed bacteria cultured in 2xTY/GA medium. Expression of scFv fragments were induced by addition of IPTG to a final concentration of 1 mM for overnight at 30 °C while shaking and the periplasmic fraction was extracted via osmotic shock. The purification of 6xHis tagged TNF- α scFv performed based on IMAC. The eluted fractions used as diagnostic antibody in western blot analysis for detection of TNF- α in blood serum of patients with inflammatory diseases and also used as diluted fraction (1:1000) in (ACP)-ELISA.

Results:

The TNF- α scFv antibody was successfully expressed and purified. The purity of the scFv fraction was confirmed using SDS-PAGE analysis which revealed a band around 30 kDa for the purified scFv fragment and confirmed by immunoblotting assay using 9E10 anti-cMyc monoclonal and GAMAP antibodies. The TNF- α was detected successfully in Western blot analysis using the purified TNF- α scFv antibody which showed a band of approximately 51 kDa for TNF- α in active form of trimer in the blood serum of patients with inflammatory diseases. (ACP)-ELISA using serial dilutions (2.5-0.009 μ g/ml) of TNF- α fusion protein showed that the detection limit for the purified TNF- α scFv monoclonal antibody (1:1000) was at a concentration of 0.019 μ g of recombinant TNF- α per ml.

Conclusion:

In this study, the novel scFv antibody against TNF- α was purified by modified Tag ligands Affinity-based chromatography column containing nickel resin. Based on our findings the produced and purified antibody can be applied successfully for detection of TNF- α in diagnostic strategies.

Keywords:

Anti-TNF- α , High throughput Purification, Diagnostic Properties

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Synthesis of stimuli responsive mesoporous silica nanoparticles for DOX delivery

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5-7 February 2020

Poster 159

Abstract Presenter:
Seyed Mostafa Ebrahimia

* **Correspondance:**
Arash Mahboubi

ABSTRACT:

Smart nanocarriers are among the most effective nanoscale vectors of therapeutic agents in cancer therapy. In this study, mesoporous silica nanoparticles (MSN) are functionalized with stimuli-responsive polymeric shells, PNIPAM-co-PHEMA and disulfide bonds which have thermal and redox sensitivity, respectively. Chemical and physical properties of the novel drug delivery vehicle have been indicated and utilized in a pinpointed DOX delivery system. At 25 °C, 13% of DOX was released from poly(NIPAM-HEMA-SS)/MN-MSNs in 12 h; as the temperature increased to 41 °C, the cumulative release amount of DOX in 12 h increased to 43%. Moreover, it was shown that in the presence of DTT, a more rapid release rate of DOX was observed. The findings of the in vitro hemolysis and in vivo biochemical study showed negligible toxicity of poly(NIPAM-HEMA-SS)/MN-MWCNTs in mice during a 10-day experiment at high dosages. The thermo responsive cytotoxicity of DOX–poly(NIPAM-HEMA-SS)/MN-MSN was studied in vitro. In addition, As the temperature rises, the viability decreases significantly. the cell survival ratio was reduced from 57% ± 1% at 37 °C to 49% ± 2% at 41 °C at a concentration of 2 µg mL⁻¹ because of the increased drug release under these conditions, which is similar to the in vitro drug release.

Keywords:

Anti-TNF- α , High throughput Purification, Diagnostic Properties

Response Surface Methodology Based Optimized Expression of Anti-EpEX scFv in Escherichia coli SHuffle® T7

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5-7 February 2020

Poster 160

Abstract Presenter:

Parisa Aghamollae

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Atieh Hashemi

ABSTRACT:

Epithelial cell adhesion molecule (EpCAM) is an intra-membrane glycoprotein that is highly expressed in a number of cancers. For this reason, this molecule is recognized as a marker of tumor stem cells and a potential target for cancer treatment. Small fragments of recombinant antibodies, such as the scFv (single chain fragment variable), retain the overall targeted function of monoclonal antibodies but are more economically viable and exhibit better pharmacological properties and are therefore valuable for diagnostic and therapeutic applications. Escherichia coli is the most widely used host for the production of recombinant proteins. In addition to cheap production and high production efficiency, Escherichia coli allows genetic engineering to improve scFv properties such as increased binding affinity and altered specificity. In this study, a practical approach is proposed to optimally express a scFv against the EpCAM extracellular chain (EpEX) in Escherichia coli.

The optimized codon gene encoding the anti-EpEX scFv cloned in the pET-Duet (+) vector was transferred to Shuffle strain-competent Escherichia coli cells. The expression of recombinant protein was optimized by designing experiments based on Response-Surface Methodology and Central Composite Design using four factors of incubation time (8, 16, 24, and 32 hours) incubation temperature (16, 23, 30, 37, and 44 °C) IPTG inducer concentration (0.2, 0.4, 0.6, 0.8, and 1 mM) and optical density (0.5, 0.6, 0.7, 0.8, and 0.9).

Polyacrylamide gel electrophoresis (SDS-PAGE) and western blot technique showed a protein of approximately 30 kDa that corresponds to the scFv expressed in Escherichia coli by the Shuffle strain. The highest concentration of total protein sample was obtained by incubation at 37 °C, 0.4 mM IPTG and OD 0.8 for 16 h. The results of this study allow the development of scFv-based drugs for the treatment of a wide range of tumor cells.

Keywords:

Escherichia coli, expression, optimization, scFv, anti-EpEx, shuffle

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Investigation of effects of Capsaicin on p-gp activity in, in vitro and in vivo models.

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5-7 February 2020

Oral 1

Abstract Presenter:

Nazanin Zamani

* **Correspondance:**

Negar Zamani

Introduction:

Capsaicin is one of the potent component of hot chilli and in this study the goal is to observe the effect of inhibition or stimulation of this compound on p-gp function both in invitro and invivo expressions.

as we know p-gp(p-glycoprotein) is a drug transporter, wich is in most layers of our cells such as brain, liver and specially in intestine, wich relate to ABC transporter family. this pump mostly is responsible for effluxing the chemical agents such as drugs and in this observation and study we want to search about conjugates or other chemical or natural compounds that can effect on p-gp function and inhibit them.

Materials and Methods:

In this study the level concentration of 20 micro M to 100 micro M of capsaicin were used, this range of concentration is not toxic for cells. and the control drug is verapamil wich is substrate for p-gp and the drug analyze is digoxin.

this inhibition effect is influenced by the concentration and duration of exposure of capsaicin. also the methods used in this study include western blot anal of p-gp for measuring protein concentration and HPLC method for analyzing invivo datas and PCR method of MDR1.

Results:

Exposing Capsaicin at concentration level up to 100 micro M has no toxic effect on Caco2 cells and the evaluation effect of Capsaicin in Caco2 cells proliferation shown that at 20 micro M cell viablity was about 75% of the control group and proliferation was unaffected and the results shown that incubation with 50 micro M of Capsaicin for 48h resulted in significant increase of S phase of cells.

finally p-gp function was evaluated by measuring transepithelial transport of digoxin across Caco2 cells and like the p-gp inhibitor,verapamil,Capsaicin also increased digoxin transport and inhibit the drug transport across Caco2 cells.and the effect of Capsaicin on digoxin permeability was concentration dependent over the range of 20-50 micro M and the maximum inhibition of p-gp function was shown at 50 micro M of Capsaicin wich made a comparable results with 100 micro M of control group(verapamil),but increasing concentration from 50 up to 100 didn't cause more changes in digoxin permeability.

Conclusion:

The result in this study shown that a specified dose of Capsaicin can inhibit the function of p-gp and when Capsaicin is consumed with the drugs that are p-gp substrate, the oral bioavailability of these drugs influenced and increased with a regime of hot chilli.

Keywords:

Capsaicin, p-gp, inhibition, effecttransporter, Caco2 cells

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Synthesis and investigation of physicochemical characterization of magnetic molecularly imprinted polymer nanocomposite for controlled release of doxorubicin using curcumin as an alternative template based on green strategies and modeling methods

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5-7 February 2020

Oral 2

Abstract Presenter:

Elham Akbari

* **Correspondance:**

Mehdi Ansari Dogaheh

Introduction:

Doxorubicin (DOX) is one of the most potent and commonly used chemotherapeutic agents for the treatment of several types of cancer. Nevertheless, it exhibits serious adverse effects, such as lethal cardiotoxicity and dose-limiting myelosuppression. Molecular imprinting technology (MIT) is a technique for creating molecular imprinted polymers (MIPs) with tailor-made binding sites complementing template molecules in shape, size and functional groups. The selection of the best monomer for polymer preparation is commonly based on trial and error experiments which is time-consuming and waste producing. To overcome these problems, computational softwares such as Guassian can be used in designing and assessment of MIPs which save time, resources, and waste in laboratory. DOX is cytotoxic and hazardous, therefore it would be safer to use alternative molecule like curcumin with the highest monomer-template complex binding energy to design and synthesis MIP for DOX .

Methods:

Magnetic-Mip was synthesized based on curcumin as template, methacrylic acid (MAA) as functional monomer, ethylene glycol dimethacrylate(EGDMA) as cross linker. Briefly, 1 mmol of curcumin and 6 mmol of MAA was dissolved in 10 ml of DMSO. That mixture stirred for 1h then 1g of Fe₃O₄ dispersed in 0.25 mL oleic acid and 0.2g PVP admixed with presumable solution. The mixture was mixed for 2-3h to form a complex of template molecules and monomers. In the next step, 35 mmol of EGDMA and 0.1g of azobisisobutyronitrile (AIBN) was added. The solution saturated with dry nitrogen and then placed in a water bath of 60°C for 24h by gently stirring. After polymerization the Mag-MIPs extracted with a mixture of methanol and acetic acid (9:1) (v/v) to elute curcumin and finally reloaded DOX on the scaffold. The polymer was characterized by various methods and isotherm for adsorption and release properties also was measured.

Results:

This work demonstrates DOX has been loaded onto synthesized polymer and its loading pattern follows Hill-Deboer isotherm model. DOX releasing from the polymer also has been evaluated by Frantz diffusion cell and showed a controlled release procedure. Particle size analysis, SEM, TEM, FTIR, VSM, DSC assessed properties like morphology and interaction of drug- polymer.

Conclusion:

Curcumin as a surrogate template which is safe to environment and human for the preparation of magnetic molecularly imprinted polymer showed suitable selectivity to DOX

Keywords:

Doxorubicin, MIP, Green synthesise, Curcumin, Cancer

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The effects of Peppermint oil loaded nano lipid carriers (NLCs) on the induction of cell apoptosis in colon and skin cancers Authors

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5-7 February 2020

Oral 3

Abstract Presenter:
Nazanin Zamani

* **Correspondance:**
Nazanin Zamani

ABSTRACT:

Finding advanced natural compounds with selective cytotoxicity toward human cancer cells is the main aim of all antitumoral drug delivery systems. peppermint oil(PO) has been identified as a new agent that can induce cellular apoptosis in cancer.

Peppermint oil is obtained from the leaves of the perennial herb, *Mentha piperita* L. and *M. arvensis* var. *piperascens* a member of the labiatae family. It is a colorless, pale yellow or pale greenish-yellow liquid having characteristic odour and taste followed by a sensation of cold, freely soluble in ethanol (70%).

This study evaluated the application of nanostructured lipid carriers (NLCs) in enhancing cytotoxicity and apoptosis effects of PO on colon (HT-29) and skin (A-431) cancer cells. First, PO identification was conducted using gas chromatography-mass spectrometer technique. PO-loaded NLCs (PO-NLCs) was then characterized for particle size and zeta potential. The antioxidant activity of PO-NLCs were investigated using MTT assay, DAPI staining, respectively. The percentage of cellular apoptosis was determined by flow cytometry. GC-MS analysis represent 8 compounds in the peppermint oil. Optimized formulation exhibited desirable physical characteristics like a narrowly distributed nano-size (100 nm), zeta potential value (+6±2 mV). The IC₅₀ of PO and PO-NLCs were in HT-29 cells 77.51±3 μM and 68.72±5 μM as well A437 cells 65.24±5 μM and 56.12±4 μM, respectively. PO-NLCs increased the percentage of respectively early and late cell apoptosis in the treated HT-29 cells 17.87%, 10.31% and A437 cells 19.85%, 13.23% (both p 0.05). Therefore, PO-NLCs show considerable potential for chemo-preventive use in colon and skin cancer

Keywords:

Pepeermint, nanolipid, carriers, skin cancer, apoptosis, colon cancer

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Co-delivery of epirubicin and antimir-21 based on MUC1 aptamer-modified PLGA-PBAE nanocomplex platform; in vitro and in vivo

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5-7 February 2020

Oral 4

Abstract Presenter:

Mahsa Shahriari

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Mahsa Shahriari

ABSTRACT:

In this study, a delivery system was fabricated for co-delivery of Epi and antimir-21 into breast and colon cancers based on poly (β amino ester) (P β AE) polymer as a core for delivery of antimir-21 and MUC1 aptamer-modified PLGA as a reservoir for the hydrophilic drug (Epi). P β AE is a pH-responsive positively charged biodegradable polymer which has an ease of synthesis (1,2). Due to the low pH level in tumor tissue, P β AE provides a smart intelligent complex which can increase the release of cargo in the site of action. On the other hand, co-delivery of Epi and antimir-21 leads to enhance cytotoxicity of nanoparticle for target cells (MCF-7 and C26 cells, MUC1 positive) and decrease the required amount of Epi as a chemotherapeutic drug, resulting in low cytotoxicity in non-target tissues and cells (CHO cells, MUC1 negative). Also, the neutral charge of PLGA-Epi-P β AE-antimir-21 nanocomplex is considered as an advantage to prevent the internalization of the nanocomplex (MUC1 aptamer free) into target and non-target cells, leading to very low cytotoxicity of the nanocomplex in these cells lines in the absence of MUC1 aptamer. The obtained results demonstrated that the fabricated MUC1 aptamer-modified nanocomplex could efficiently be internalized into MCF7 (human breast carcinoma cell) and C26 (murine colon carcinoma cell) cells through interaction between MUC1 aptamer and its receptor on the surfaces of these cell lines and decline cell viability in these cells but not in CHO cells (Chinese hamster ovary cell) as nontarget cells (MUC1 negative cells). Moreover, it was demonstrated that MUC1 aptamer-modified nanocomplex could remarkably inhibit tumor growth in tumor-bearing mice compared with Epi alone.

Keywords:

MicroRNA-21, Epirubicin, MUC1 aptamer, Polymer, Targeted delivery

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Delivery of Mitoxantrone using a pH-sensitive Boronated chitosan-Urocanic acid nanoparticles for the treatment of glioblastoma Multiforme cells

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5-7 February 2020

Oral 5

Abstract Presenter:

Fatemeh Dousti

*** Correspondance:**

Fatemeh Dousti

Introduction:

Glioblastoma multiforme is one of the most malignant types of tumors. Despite advances in treatment modalities it remains largely incurable. Mitoxantrone has proven efficacy against malignant glial cells. Systemic delivery of MTO is not feasible due to dose-limiting side effects such as cardiotoxicity. NPs-based delivery platforms are an attractive means to target therapeutic molecules to tumors and reduce systemic toxicities. Studies show that the compound containing boron in the NPs can attach to sialic acid on the cancer cell surface. The present study was aimed to increase the targeted delivery of MTO to glioma cells by synthesis of a pH-sensitive targeted Boronated chitosan-Urocanic acid NPs.

Methods:

At the first to improve the water solubility of CS, imidazolium chloride was applied to modification. In the second step, to prepare a pH-sensitive system, Urocanic acid was grafted onto the CS. To make the targeted system, BPA was attached to the main body of the CS. Preparation of CS NPs and MTO loaded CS NPs were prepared by TPP as cross-linking agent. The size and zeta potential of prepared nanoparticles were studied by direct light scattering and surface morphologies of the NPs were observed by Transmission Electron Microscopy. The release profile of MTO from the prepared NPs at acidic pH(5.7) and physiological pH(7.4) was evaluated. MTT assays were used to determine the in vitro cytotoxicity of free MTO, MTO loaded CS NPs and blank NPs on U87MG cells. Studying of cellular uptake using Fluorescein sodium (Flu) labeled NPs was confirmed by Flowcytometry.

Results & Discussion:

The FT-IR and NMR spectra confirmed the structure of modified systems. Particle size of NPs was found to be less than 150 nm with +10 mV zeta potential. The quantity of MTO loaded in NPs was about 80%. About of 90% of loaded MTO was released at acidic condition after 100h. The MTT assay of this synthesized NPs showed promising and effective anticancer activity against U87MG. According to flowcytometry histograms, fluorescence intensity of Flu labeled NPs increased as incubation time increased, suggesting time dependent endocytosis internalization of NPs.

Keywords:

Chitosan(CS), Mitoxantrone(MTO), Nanoparticles(NPs), boronophenylalanine(BPA), pH-sensitive

References:

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Plasma concentration of Indoxyl Sulfate in Chronic Kidney Disease (CKD) patients

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5-7 February 2020

Oral 6

Abstract Presenter:

Fatemeh Norouzi

* **Correspondance:**

Ali Shayanfar

Introduction:

Indoxyl sulfate, a protein-bound uremic toxin, accelerates the progression of chronic kidney disease (CKD) and is synthesized in the liver from indole, produced from tryptophan by intestinal flora.

Despite the wide role of IS in the pathology of renal diseases and cardiovascular events, few methods are available for the quantification of IS in biological fluids and most of them require extensive preparation and long laboratory run time and its concentration in plasma of CKD patients as a uremic toxin is essential.

The goal of this study was to evaluate the plasma levels of IS in CKD patients using salting-out assisted liquid-liquid extraction (SALLE) and spectrofluorimetry .

Methods:

In this study 60 serum samples were obtained from CKD patients from Sina hospital, Tabriz, Iran. They were extracted and deproteinized by the addition of nine parts of acetonitrile to one part of plasma and centrifuged for 10 min at 8000 rpm. The supernatant was transferred to a microtube and 500 μ L of sodium chloride was added for salting out of analyte. Then, the fluorescence intensity of separated organic phase was determined by spectrofluorimetry.

Results:

The affecting parameters on extraction, i.e. volume of solvent, pH, the concentration of salt optimized and the developed method was validated for quantification of IS with good precision and accuracy (less than 15%). The concentration of IS in plasma of CKD patients was 11.35 to 47.8 mg/L. (mean= 23.15 mg/L)

Discussion:

IS, was thought to play a significant role in the progression of CKD, tubulointerstitial fibrosis, glomerular sclerosis, endothelial proliferation and wound repair were also inhibited by IS [5]. A sensitive and reproducible SALLE extraction method was developed and validated for the determination of IS in plasma. It provides similar simplicity to protein precipitation, but cleaner extracts due to a true phase separation. The precision and accuracy are within the limits required for biological analytical assays.

Keywords:

Chronic Kidney Disease Patients, Indoxyl Sulfate, Salting-out assisted liquid-liquid extraction

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Ketoconazole Solubility in Aqueous Binary Mixture of N-Methyl-2-pyrrolidone at Various Temperature

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5-7 February 2020

Oral 7

Abstract Presenter:

Ayda Hatefi

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Abolghasem Jouyban

ABSTRACT:

Solubility is one of the most important thermodynamic properties in drug discovery. Various methods have been developed to increase the aqueous solubility of a poorly soluble drugs such as cosolvency that is the most common method in pharmaceutical industry. In addition to the exhaustive experimental approaches for determination of solubility in different solvents at various temperatures, a number of mathematical models have been developed for predicting of solubility and other physicochemical property such as density. The mathematical methods are good alternatives to experimental determinations, for the purpose of finding suitable cosolvent concentrations to maximize the drug solubility. The objectives of this work were to 1) determine the solubility and density of saturated solutions of ketoconazole in the binary solvent mixtures of NMP&water at 5 temperatures 293.2 to 313.2K; 2) correlate the experimental density data with the Jouyban-Acree model; 3) calculate the mixing thermodynamic properties of ketoconazole dissolved in mixtures of NMP&water. In this study, solubility of ketoconazole was measured in binary mixtures of {NMP+water} by a simple shake-flask method at 5 temperatures. The experimental solubility data of ketoconazole in NMP+water were correlated by some developed cosolvency methods. Furthermore, the apparent thermodynamic properties of dissolution process of ketoconazole in all the mixed solvents were calculated according to vant Hoff and Gibbs equations. According to solubility data, the highest value is obtained in neat NMP at 313.2K whereas the lowest value is observed in neat water at 293.2K. Moreover, it can be seen that ketoconazole solubility data shows an increase in solubility with an increase in temperature, and at all temperatures, the solubility rises as the NMP proportion in the solvent mixtures increases and reaches a maximum value in neat NMP. This study reports the measured solubility data in the mixtures of NMP+water at 5 temperatures. 8 cosolvency models are employed to mathematically representation of solubility data. The MRDs of models show that Jouyban-Acree & Jouyban-Acree-vant Hoff models show accurate results for the prediction of drug solubility.

Keywords:

Solubility, Ketoconazole, NMP, Binary solvent mixtures, Jouyban-Acree model

References:

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Solubility measurement and modeling data of some poorly water soluble drugs in deep eutectic solvent systems

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5-7 February 2020

Oral 8

Abstract Presenter:
Samira Zad ali asghar
*** Correspondance:**
Ali Shayanfar

Introduction:

Nowadays a new generation of solvents named deep eutectic solvent systems (DESs) has received great attention at various fields such as drug delivery because of their unique properties. These solvents are prepared by mixing a hydrogen bond acceptor (e.g. choline chloride) and a hydrogen bond donor (e.g. urea, glycerol) with various molar ratio. The melting point of the mixture is decreased because the formation of hydrogen bond between DES components reduces the lattice energy of component of the eutectic systems. As compared to the ionic liquids, DESs derived from choline chloride possess good advantages such as low price, easy to prepare, biodegradable, biocompatible, non-toxic and chemical inertness with water. In this study, solubilities of Glibenclamide, Tadalafi, Piroxicam, Lamotrigine, Benzoic acid, Salicylic acid, Ibuprofen, Ketoconazole, Phenothiazine, Carbamazepine, Carvedilol, Phenytoin, Atenolo as very poor soluble drugs have been investigated in two DES systems (choline chloride + urea/ glycerol).

Methods:

DES systems were prepared by mixing 1:2 molar ratio of choline chloride: urea/glycerol, respectively. Then, the 10% and 50% mass fraction of DES were made and excess amount of poorly soluble drugs were added into glassy vials and aqueous solution were shaken in an incubator for a period of 48h at 310 K until the equilibrium was obtained. Finally, the absorption of diluted samples was read by UV spectrophotometer and the concentrations of samples were calculated based on calibration curves

Results:

The solubility of some poorly water soluble drugs significantly increased with the addition of DES to the aqueous solutions. Quantitative structure property relationship (QSPR) models based on solubilization ratio and structural parameters with an acceptable statistical parameters were obtained

Conclusion:

The obtained experimental data show the possibility of applying DES as a medium for solubility enhancement of poorly water soluble drugs and encourage to investigate solubility in other DES + water systems. QSPR models indicated that various parameters can effect on solubilization of solute in DES + water mixtures

Keywords:

Choline chloride, Quantitative structure property relationship, Solubility, Urea, Glycerol

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The randomized clinical trial of Allopurinol for the prevention of periprocedural myocardial injury following elective percutaneous coronary intervention

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5-7 February 2020

Oral 9

Abstract Presenter:

Elnaz Khani

* **Correspondance:**

Taher Entezari Maleki

Introduction:

Periprocedural myocardial injury (PMI) following elective percutaneous coronary intervention (PCI) is an important therapeutic concern with mortality and morbidity. Oxidative stress and increased activity of xanthine oxidase (XO) are the factors with important roles in cardiovascular-related complications. Allopurinol can have cardiovascular benefits by several mechanisms. Allopurinol inhibits XO, a potent mediator of oxidative stress, and consequently reduces tissue oxidative stress significantly. Thus, we aimed to evaluate the allopurinol effects on creatine kinase-MB (CK-MB) and Troponin-I as cardiac biomarkers.

Methods:

In this randomized, clinical trial, 108 patients who scheduled for elective PCI were allocated into the intervention (n = 53) and the control group (n = 55). The intervention group received a 1200 mg loading dose of allopurinol 2 hours before the procedure. The level of CK-MB and Troponin-I were measured before the procedure, 8 and 24 hours after .

Results:

The CK-MB elevation (above the upper limit normal) was occurred in 14.5% (n = 8) of allopurinol and 7% (n = 4) of control (p = 0.004) groups. The elevation of Troponin-I was documented in 1.8% (n = 1) of both groups. No significant changes in the level of cardiac biomarkers were also noted .

Conclusion:

To the best of our knowledge, there is no published study that investigates the potential benefit of allopurinol in preventing PMI following elective PCI. According to this study, the pretreatment with 1200 mg allopurinol 2 hours before the procedure could not reduce PMI following elective PCI.

Keywords:

percutaneous coronary intervention, allopurinol, Periprocedural myocardial injury, CK-MB, Troponin-I

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Molecular cloning and soluble overexpression of recombinant glutaminase for ALL treatment

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5-7 February 2020

Oral 10

Abstract Presenter:

Shayan Simay

* **Correspondance:**

Yadollah Omid

Introduction:

Due to the enormous burden of cancer on society worldwide, the development of novel therapeutic agents and strategies against cancer is one of the popular medical research fields. L-glutaminase (EC 3.5.1.2) is a member of the beta-lactamase superfamily that catalyzes the hydrolytic degradation of L-glutamine to L-glutamic acid. The depletion of the glutamine can starve the tumor cells and lead to activating apoptosis pathways, regulating proliferation rate, and stopping tumor growth. L-glutaminase is widely distributed among different microorganisms. The aims of this study are the identification of the L-glutaminase gene from a new halo-thermotolerant *Bacillus*, molecular cloning, and optimization of soluble overexpression in prokaryotic expression systems.

Methods:

In this study, the glutaminase gene (GlsA) from locally isolated *Bacillus licheniformis* SL-1 was identified and cloned into the pET22b+ expression vector. Recombinant glutaminase was overexpressed in modified *Escherichia coli* strains, Origami B and BL21. Enzyme production was optimized in different temperatures and IPTG concentrations in both expression systems. Then, extraction was conducted at 4°C in a protease inhibitor-containing lysis buffer using sonication and freeze-thawing methods. The crude extracts from bacterial cells and expression efficacy were analyzed on 12% SDS-PAGE. The recombinant glutaminase was tagged with a polyhistidine tag at C-terminus and could be efficiently purified by nickel-sepharose beads using immobilized metal affinity chromatography (IMAC) method to apparent homogeneity.

Results:

From the results, the recombinant glutaminase was significantly overexpressed in the soluble fraction obtained from *E. coli* BL 21. The yield of the enzyme in *E. coli* BL21 showed significant improvement over the glutaminase produced in the Origami expression system. From SDS-PAGE analysis, the molecular weight of glutaminase monomers was detected around ~39 kDa. The optimal condition for recombinant enzyme production was adjusted at 20 °C, 180 rpm, 1 mM IPTG, and OD: 0.7-0.9.

Conclusion:

The identified glutaminase from new halo-thermotolerant bacillus with high overexpression capacity in prokaryotic systems can be considered as a potential anti-cancer agent in ALL treatment.

Keywords:

Glutaminase, Cloning, Expression optimization, Soluble overexpression

References:

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Natural polymers for vaginal mucoadhesive delivery of vinegar, Using Design of Experiment Methods

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5-7 February 2020

Oral 11

Abstract Presenter:

Zahra Hesari

*** Correspondance:**

Zahra Hesari

Introduction:

Vinegars are of the main international traditional nutraceuticals which have been widely used as vaginal health protectant due to maintenance of vagina pH balance and antimicrobial properties. Since the main dosage form of vinegar was liquid which was difficult for vaginal application with low residence time, in this study a vaginal mucoadhesive gel of vinegar was designed.

Method and Results:

Xanthan gum and tragacanth were utilized as natural gel forming polymers. The effects of Xanthan gum and tragacanth on mucoadhesion strength and drug release of the gel formulations were optimized using a 3 level (32) factorial design. Several physico-chemical properties of the gel formulation including gel viscosity, spreadability, scanning electron microscopy (SEM) images of hydrogel chains, and release kinetic were also investigated. Results demonstrated that tragacanth possesses a statistically significant effect on release rate control (p-value=0.0027) while both tragacanth and xanthan gum have significant effect (p value= 0.0001 and 0.0017 respectively) on mucoadhesion property .

Conclusions:

Design of experiment suggested that Formulation F7 with 5% xanthan gum and 1% tragacanth (mucoadhesion = 0.4632 N and release rate = 88.8% in 6 hours) can be considered as the optimum formulation with some modifications.

Keywords:

mucoadhesive vaginal gel, vinegar vaginal gel, natural polymers, vinegar, Design of experiment

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Antibacterial Gelatin-Tannic Acid Hydrogel with Radical Scavenging and Hemostatic Function for Wound Healing Acceleration

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5-7 February 2020

Oral 12

Abstract Presenter:

Zainab Ahmadian

* **Correspondance:**

Mohammad Ali Shahbazi

Introduction:

Treatment of chronic deep wounds, as a major clinical challenge with therapeutic impedance, has caused tremendous economic burden worldwide. Herein, by using green approach, a novel multi-functional hydrogel was fabricated through abundant hydrogen bonding among the functional groups of gelatin and tannic acid (TA) for wound healing. While holding the merit of facile encapsulation of hydrophilic drugs like allantoin (Alla) inside its matrix as a stimulatory molecule for cell proliferation at the site of injury, wound healing is further accelerated through multifaceted mechanism of TA, including its antibacterial, antioxidant, hemostatic, and antiinflammatory properties³

Methods:

Four types of hydrogel were prepared by different amounts of TA and characterized in respect to yield, gelation time, gel content, initial water content, swelling, water retention, degradation, porosity, structural morphology. Fourier transform infrared Spectroscopy (FTIR), X-ray diffraction (XRD), thermal gravimetric analysis (TGA) and differential scanning calorimetry (DSC) analysis were performed for gelatin-tannic acid (GelTA) and its components. Release studies of TA and Alla, antioxidant effect of the GelTA and its components and antibacterial capacity of hydrogel were evaluated, too. In vitro blood clotting index (BCI) and in vivo tail amputation model for evaluation of blood clotting, cell viability on fibroblast cells, hemolysis assay, in vivo toxicity and in vivo wound healing were also evaluated .

Results and Discussion:

Results showed that by alteration in TA concentration, physicochemical properties of the hydrogel are simply adjustable. FTIR, DSC and TGA results confirmed hydrogel formation and drug loading. The hydrogel showed both control and pH responsive manner for the TA release. Furthermore, the hydrogel revealed anti-oxidant, anti-bacterial and blood clotting capacities. The hydrogel had very high safety both in vitro and in vivo on mammalian cell lines, Red blood cells) RBCs (and mice organs such as kidney, liver, and spleen. In addition to the controlled drug release, the hydrogel showed a desirable effect on the formation of extracellular matrix and wound healing in vivo .

Conclusions:

The above results showed that the drug loaded hydrogel possess low toxicity and useful properties for wound healing acceleration, introducing it as a great candidate for clinical applications.

Keywords:

Multifunctional hydrogel, Gelatin, Tannic acid, Allantoin, Wound dressing

References:

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The Analysis of Tendency and Knowledge about Entrepreneurship in Pharmacy Students of Kermanshah University of Medical Sciences

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5-7 February 2020

Oral 13

Abstract Presenter:

Mohammad Shams

* **Correspondance:**

Mohammad Shams

Introduction:

Health entrepreneurship is one of the important challenges facing medical education system and also pharmaceutical industry. The purpose of this study was examination of tendency and knowledge of pharmacy students about entrepreneurship in Kermanshah university of medical sciences in July 2018.

Methods:

5 pharmacy students of first year (semester 2) were examined in this study. The purpose was scanning student's tendency with entrepreneurship in 1 question and their knowledge about entrepreneurship in 43 questions classified in 6 domains. Data was gathered by a questionnaire which designed by authors. The validity approved by experts and reliability verified by cronbach's alpha index. Data analyzed using the software SPSS.25.

Results:

Student's tendency was relatively high (60.66%) but their knowledge was relatively low (16%). The tendency in "tuition-based" students was the most and the tendency in "committed to government" students was the least.

Conclusion:

Student's tendency for entrepreneurship is relatively good, but their knowledge is so weak. It is necessary to take steps to increase their knowledge of entrepreneurship

Keywords:

entrepreneurship, medical education, pharmacy, Kermanshah, business, ecosystem

References:

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سید علی سیادت، شکوفه سادات رضازاده، حسن بیری، میزان روحیه کارآفرینی دانشجویان علوم پزشکی اصفهان، مجله ایرانی آموزش در علوم پزشکی، دوره ۱۲، شماره ۷، مهر ۱۳۹۱، صفحه ۵۳۴

Anxiolytic Effects of Achillea Wilhelmssi Essential Oil and its Mechanisms in Rats

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5-7 February 2020

Oral 14

Abstract Presenter:

Mohammad Bagher Majnooni

* **Correspondence:**

Mohammad Bagher Majnooni

ABSTRACT:

Nowadays, aromatherapy has been widely used in the treatment of psychiatric disorders, including anxiety. Therefore, in this study, we investigated the anxiolytic effects of Achillea wilhelmssi essential oil, which is also used in traditional Iranian medicine for this purpose. On the other hand, possible mechanisms and essential oil composition were studied. Male Wistar rats (n=8) were categorized in 8 groups including Volatile oil (0.5 and 1 mg/kg), Diazepam (1 mg/kg), Vehicle (saline with tween 80 0.1% V/V), combination of diazepam (1mg/kg) and naloxone (5 mg/kg) or flumazenil (2 mg/kg), combination of volatile oil (1 mg/kg) and naloxone (5 mg/kg) or flumazenil (2 mg/kg). The anxiolytic effects and locomotor activity of the rats were investigated by elevated plus maze (EPM) test. In this test, the rats, after 30-minute pretreatment with intraperitoneal (i.p.) injection of essential oil and other drugs, were placed on the open arm of the maze and variables such as the number of entries to open and closed arms and the percentage of time spent in open and closed arms were measured. An HP 6890N GC system, coupled with an HP MSD5973N quadruple mass spectrometer was used for separation and identification of essential oil. ANOVA with the Tukey posttest was utilized to analyze. The main constituents of fifty-five identified compounds were p-cimene (23%), 1, 8-cineole (20.8%), carvone (19.13%), camphor (6.67%), and verbanol acetate (3.53%). Also, 1 mg/kg of the oil significantly (P 0.05) showed anxiolytic activity through increasing the percentage of time spent and the number of entries in the open arms of the maze compared to the vehicle-treated group. This dose of the drug did not change the total number of entries in the maze arms. The results showed that the anxiolytic effects of Achillea wilhelmssi may be effected via bonding opioid receptors because naloxone (5 mg/kg) is unlike flumazenil (2 mg/kg) could significantly decrease the number of open arm entries, total number of entries or the percentage of open arm time in the oil-treated group. The study of the anxiolytic effect of each compound is suggested.

Keywords:

Achillea wilhelmssi, Anxiolytic, essential oil, opioid receptors, elevated plus maze

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Phytochemical and anti-oxidative activities of *Acantholimon atropatanum* Bunge

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5-7 February 2020

Oral 15

Abstract Presenter:

Mahnoush

Kouhihabibidehkordi

* **Correspondance:**

Fariba Heshmati Afshar

ABSTRACT:

Acantholimon genus, has large biodiversity among the Plumbaginaceae family. in this study, we carried out the correlation between the antioxidant activity of *A. atropatanum* methanolic extract and its fractions with their phenol and flavonoid contents. the other purpose of this study was to isolate the compounds of methanolic extract of aerial parts of *A. atropatanum*. Methods: Methanolic extract of the aerial parts of *A. atropatanum* was fractionated over a C-18 Sep-pak and chromatographic separation was performed on a reversed-phase preparative HPLC. Structural elucidation of the isolated compounds was carried out using UV, 1H-NMR spectral analyses. Anti-oxidant activities of methanolic extract and all fractions were determined by DPPH assay. Total Phenol Content(TPC) and Total Flavonoid Content(TFC) of methanolic extracts and its fractions were determined by Folin- Ciocalteu assay and a colorimetric assay, respectively. Results: Reversed-phase HPLC analysis of 20% and 40% fraction of methanolic extract afforded one acid phenolic and a flavonoid structure, which were identified as 3-O-β-D-glucopyranoside,4-O-α-L-glucopyranoside-protocatechuic acid(No.1) and 6-hydroxy-kaempferol(No.2) on the 1H-NMR data analyses, respectively. methanolic extract and all fractions reduced DPPH radicals in a concentration-dependent manner. but the free radical scavenging of 20% and 40% (MeOH-water) fraction was superior than other fractions. According to the results obtained from the determination of TPC and TFC, it was found that 20% and 40% (MeOH-water) fractions contained more phenolic and flavonid contents than the other fractions. Conclusions: Phytochemical study, TPC, TFC and DPPH test of the aerial parts of *A. atropatanum* demonstrated that this plant is a good source of flavonoids and phenols, which are popular for their various health benefits such as antioxidant, anti-inflammatory and anticancer activities. The result of present study on isolation and identification structure No.1 and No.2 is indicative of more medicinal potentials of this species and suggests it as an appropriate candidate for more pharmacological studies.

Keywords:

DPPH, HPLC, *Acantholimon atropatanum*, Total Flavonoid, Total Phenol

References:

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Evaluation of the effects of celecoxib and crocin in the prevention of Morphine induced dependence in mice

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5-7 February 2020

Oral 16

Abstract Presenter:

Sarah Majidpour

* **Correspondance:**

Bahlool Habibi Asl

Introduction:

Inflammatory factors and Oxidative stress affect the opioid system. Celecoxib, is an anti-inflammatory drug and crocin (saffron extract) as an herbal agent have antioxidant activity. The aim of the present study was to investigate the effects of celecoxib and crocin in the prevention of Morphine induced dependence in mice.

Materials and Methods:

Ten groups containing 9 male mice in weight group 20-30 gr were randomly selected and received the regimens mentioned below once daily for 4 days.

- 1) Saline (10 ml/kg, ip) + Saline (10 ml/kg, ip)
- 2) Morphine (50 mg/kg, ip) + Saline (10 ml/kg, ip)
- 3) Morphine (50 mg/kg, ip) + tween80(5% w/v, 10ml/kg, ip)
- 4,5,6) Morphine (50 mg/kg, ip) + crocin (100,200,400 mg/kg, ip)
- 7,8,9) Morphine (50 mg/kg, ip) + celecoxib (5,10,20 mg/kg, ip)
- 10) Morphine (50 mg/kg, ip) + crocin (100 mg/kg, ip) + celecoxib (5 mg/kg, ip)

To investigate the effect of drugs on Morphine dependency on day 4th, 2 hours after the last dose of Morphine injection, Naloxone was injected and symptoms of withdrawal syndrome (number of jumping and standing on feet) were recorded within half an hour in each mice. Eventually to evaluate the effect of these drugs on pro-inflammatory cytokines, blood samples from the heart of the animals were taken and tests for TNF- α were performed.

Results:

The results showed that administration of celecoxib and crocin (100,200 mg/kg) before daily injection of Morphine, didn't decrease Morphine dependency. Significant difference was not observed between (celecoxib or crocin) and morphine dependent groups.

Conclusion:

Based on these findings, celecoxib and crocin (100,200 mg/kg) along with Morphine may not be helpful in reducing morphine dependency, when chronic opioid use is required.

Keywords:

dependency, morphine, crocin, celecoxib, mice

References:

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Morphine pre and post-conditioning exacerbates apoptosis in rat hippocampus cells in a model of homocysteine induced oxidative stress

Ramin Ataee^a

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5-7 February 2020

Oral 17

Abstract Presenter:

Amin Ataie

*** Correspondance:**

Amin Ataie

ABSTRACT:

Recent investigations indicated that morphine has protective effects in different ischemia/reperfusion models and may protect against neuronal cell death, while other evidence showed that morphine induces apoptosis in neurons.

Therefore, the current study was conducted to investigate preand post-conditioning effects of morphine on hippocampal cell apoptosis in a rat model of homocysteine (Hcy)-induced oxidative stress. In the present study, 0.5 $\mu\text{mol}/\mu\text{l}$ Hcy was injected into bilateral intrahippocampal in the rat brain and morphine at a therapeutic dose of 10 mg/kg was injected intraperitoneally Δ days before and after Hcy injection in rats. The left and right rat hippocampus were removed for biochemical and histopathological analysis. In addition, hippocampal cell apoptosis was assayed by the TUNEL kit. Our results indicated that malondialdehyde (MDA) and superoxide anion (SOA) levels in the Hcy group were increased significantly compared to the control group. In addition, morphine pre- and post-treatment increased the MDA and SOA levels significantly in rat hippocampus compared with other groups. Notably, our results indicated that pre- and post-treatment by morphine increased apoptosis in hippocampus cells compared with the other group.

Keywords:

morphine, homocysteine, hippocampus, apoptosis, memory

References:

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Evaluation of synergic antidiabetic effect of of resveratrol and expression of Sirt1

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5-7 February 2020

Oral 18

Abstract Presenter:

Ramin Ataee

*** Correspondance:**

Ramin Ataee

Introduction:

Diabete is a metabolism disorder that show hypoglycemia, lipid metabolism disorder because of pancreatic Beta Cells was not product enough Insulin or body don't responded to endogenous Insulins. Today, according to existence synthetic drugs, medicinal plants use more. Resvoratrol is a natural compound that existed in plants for example Vitis spp. this compound is antioxidant, antimicrobial, antiinflammatory and antidiabetic agents.

Methods:

First, mices sheduled in six groups that one group was control group. These mices was diabetic by 200 mg/ml doses of STZ and received differents doses of resvoratrol and analysis blood sugar of them. So, liver tissue and DNA was extracted and PCR was be done. Results were analyzing by statistical software.

Results:

According to blood expriments and anti inflammatory tests, resvoratrol was show good effects on decreasing of blood sugar and neuropathyof mices. So, this natural compound decreases inflammatory factors IL-6, TNF- α and NFkB and increases antiinflammatory factor Sirt-1.

Conclusion:

Resvoratrol has blood sugar lowering antiinflammatory effects. This compound potentially is one therapeutic agent in diabetes mellitus and by effects on Sirt-1 decreases Insullin resistance and blood sugar

Keywords:

Resveratrol, Diabetes, in vivo, Sirt1, NFkB

References:

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Evaluation of anti-diabetic and anti-neuropathy properties of resveratrol and its effect on Sirt-1 expression in mice

Protective effect of Quercetin on Bisphenol-A induced mitochondrial toxicity and oxidative damage in kidney, Heart and liver rats

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5-7 February 2020

Oral 19

Abstract Presenter:
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Introduction:

Research has shown a relationship between the exposure to a chemical agent called Bisphenol-A (BPA), which is extensively used in the production of polycarbonate plastics, and the incidence of cardiovascular diseases. This study was designed to evaluate the ability of quercetin (QUER) to prevent BPA-induced mitochondrial dysfunction.

Methods and Results:

Thirty-two healthy adult male Wistar rats were randomly divided into four groups, as follows: control group (olive oil), BPA group (250 mg/kg), BPA þ QUER group (250 mg/kg + 75 mg/kg), and QUER group (75 mg/kg). All treatments were orally administered for 14 days. Kidney and liver and Heart mitochondria were isolated by administration of the different centrifugation method. The measured parameters included creatine kinase-MB (CK-MB) and lactate dehydrogenase (LDH) as the biomarkers of cardiotoxicity, triglyceride (TG), total cholesterol (TC), and lowdensity and high-density lipoprotein-cholesterol (LDL-C and HDL-C) as the measures of dyslipidemia, Uric acid and creatinine, alanine aminotransferase (ALT), alkaline phosphatase (ALP), and aspartate aminotransferase (AST), glutathione (GSH) content, catalase activity (CAT), reactive oxygen species (ROS), lipid peroxidation (LPO), and the level of damage to the mitochondrial membranes as the indicators of the impact of QUER on the BPA Kidney and liver and Heart effect.

Results:

The ameliorative effects of QUER on BPA toxicity were evaluated by determining the glutathione (GSH) content, CAT, the damage to the mitochondrial membrane, the reactive oxygen species (ROS), and lipid peroxidation (LPO). Administration of BPA significantly decreased kidney weight. In the Kidney and liver and Heart, BPA can deplete GSH content and CAT activity, increase the mitochondrial ROS formation, and enhances LPO and mitochondrial membrane damage. The BPA-induced alterations were restored in concentrations of creatine kinase-MB (CK-MB), alanine aminotransferase (ALT), alkaline phosphatase (ALP), lactate dehydrogenase (LDH), and aspartate aminotransferase (AST) due to the quercetin treatment.

Conclusions:

The pretreatment of mitochondria with QUER has the ability to reduce the toxic effects of BPA in isolated mitochondria. These findings suggest a potential role for QUER in protecting mitochondria from oxidative damage in Kidney and liver and Heart tissue.

Keywords:

Bisphenol A, Mitochondria, Oxidative stress, Quercetin, ROS

Development of an effective liposomal cholesterol ester transfer protein (CETP) vaccine for protecting against atherosclerosis in rabbit model

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5-7 February 2020

Oral 20

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Ali Badiie

ABSTRACT:

Clinical trial of cholesterol ester transfers protein (CETP) peptide vaccine was stopped after disappointing results in humans due to the inadequacy of adjuvant aluminum hydroxide in stimulating the immune response against the self-antigen of CETP (1,2,3). With the aim to increase the efficacy of the CETP vaccine, we developed a novel liposomal form of tetanus toxoid-CETP (TT-CETP) peptide (Lip CETP) with well-characterized properties and high encapsulation efficiency. The vaccine efficacy against atherosclerosis was evaluated in rabbits challenged with a high cholesterol diet. Rabbits were immunized with Lip-CETP or liposome containing CETP with CpG ODN (Lip CETP/CpG). Control groups receive empty liposomes or buffer. Anti-TT-CETP specific antibodies in serum were determined and gene expression of cytokine IFN- γ and IL-4 were measured in blood peripheral mononuclear cells. Therapeutic response was evaluated by titration of plasma lipoproteins during the study and pathologic analysis of aorta atherosclerotic lesions at the end.

Lip-CETP/CpG elicited strong anti-TT-CETP antibodies and a higher IFN- γ level than the buffer. IL-4 was lower than the buffer in all vaccinated groups. Plasma lipoproteins showed no significant difference in the studied groups. Atherosclerosis thickness grade of the aorta was lower than the buffer group (P0.001) in rabbits vaccinated with Lip-CETP but not with Lip-CETP/CpG. In conclusion, Lip-CETP showed a strong atheroprotective effect.

Keywords:

CETP vaccine, Atherosclerosis, Liposome, Cardiovascular disease

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