CURRENT RESEARCH TOPICS IN PHARMACY:

Drug Delivery

February 28th, 2023 12.00 PM ISTANBUL

FOR REGISTRATION:

First Session- *Moderator: Gülşah GEDİK 12.00-13.30 PM*

Welcome- Prof. Oya Kerimoğlu
Marmara University, Istanbul, Türkiye

Core-shell type lipid-polymer hybrid nanocarriers as novel-generation drug gelivery platform **– Assoc. Prof. Ceyda Tuğba Şengel Türk**
Ankara University, Ankara, Türkiye

Drug delivery systems used for biological products- Assist. Prof. Ongun Mehmet Saka
Ankara University, Ankara Türkiye

Viral delivery systems within the gene theraphy landscape- Dr.Ceyda Ekentok Atıcı
Marmara University, Istanbul, Türkiye

Second Session – Moderator: Ongun Mehmet SAKA 14:00-15.30 PM

Nanobiomaterials for drug delivery- Assist. Prof.Gülşah Gedik
Trakya University, Edirne, Türkiye

Microeedles : A smart approach for intradermal and transdermal drug delivery systems-Assist.Prof.Ebru Altuntaş
Istanbul University, Istanbul, Türkiye

Nose-to-brain drug delivery of nanoformulations:Preparation and in vitro evaluation– Dr.Özge Gün Eşim
Ankara University, Ankara, Türkiye

Chair
Prof. Hatice Kübra ELÇİOĞLU

Vice Chairs
Prof. Levent KABASAKAL & Assoc. Prof. Esra TATAR

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Third Session- *Moderator: Ceyda EKENTOK ATICI 16.00-18.30 PM*

Microemulsion utility in pharmaceuicals: An overwiev and pharmaceutical applications- Assist.Prof.Emre Şefik Çağlar
University of Health Sciences, Istanbul, Türkiye

Journey of the saponin from the plant to the formulation for the blocking tumor activities – Dr.Burcu Üner
The University of Health Science and Pharmacy in St. Louis, MO, USA

Development of injectable ROS reponsive nanoparticles with identified protein fpr improvement of the cardiac repiar following myocardial infarction- Dr. Renuka Khatnik
Washington University in St.Louis, MO, USA

Groundbreaking delivery systems: Liposomes-microbubbles complexes - Dr. Pankaj Dwivedi
University of Health Sciences and Pharmacy in St. Louis, MO, USA

Breaking the barriers with cutting edge intradermal delivery towards pain-free skin theraphy: Dissolvable microneedle devices for localized theraphy – Dr.Monica Dwivedi
Birla Institute of Technology, Mesra, India

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CORE SHELL TYPE LIPID POLYMER HYBRID NANOCARRIERS AS A NOVEL-GENERATION DRUG DELIVERY PLATFORM

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The main reason why nano-sized drug delivery systems are approached with increasing interest in the field of science is to increase the therapeutic efficacy and reduce the incidence of side effects by enabling drugs to be targeted. With the advent of nanotechnology, many carrier systems - from inorganic based gold nanoparticles to organic based lipid or polymeric nanoparticles - have been designed and significant developments have been achieved in terms of their use in the treatment of various diseases thanks to intense scientific investments. However, these scientific developments in nanoscale drug delivery systems do not mean that there are definite treatment regimens for many diseases, especially cancer. Because, while any drug delivery system has many advantages, it also suffers from certain structural limitations. Therefore, novel and hybrid systems, defined as integrated systems, have been developed to highlight the advantages and overcome its limitations of each system. Based on this understanding, lipid polymer hybrid nanoparticles, combining liposomes and polymeric nanoparticles, emerged as a core shell structure in which the polymeric core is covered with a phospholipid layer. These integrated systems have attracted great interest in the academic community because they combine the biomimetic characteristics of liposomes and the architectural advantages of polymeric nanoparticles in their structures [1]. The general production techniques of this novel generation drug delivery nano-sized systems are categorized into two groups as single-step techniques and double-step techniques. Many physicochemical characterization controls such as drug loading, particle size, morphological properties, surface charge, drug release, lipid-shell thickness, interface chemical composition, lipid shell fluidity, and lipid shell transition analyses are used to characterize the core shell type lipid polymer hybrid nanoparticles. For in vitro biological characterization of these integrated systems, cellular uptake and cytotoxicity analyses are utilized as basic in vitro assays to assess effectiveness of drug encapsulated hybrid particles against target cells prior to in vivo evaluations [1,2]. Reviewing the applications of core shell type lipid polymer hybrid nanosystems in the field of biomedicine, it becomes clear that they play an important role in the treatment of various disorders, especially cancer [3,4]. Despite these technological advances in core shell type hybrid systems, there are still serious obstacles to their clinical use. The most serious of these is that the current laboratory-scale production methods used for their production are not suitable for scale-up. In order to overcome these limitations, it is necessary to develop production technologies that are suitable

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or adaptable for commercial production with a multidisciplinary approach and serious cooperation.

Keywords: Core shell structure, lipid polymer hybrid nanocarriers, drug delivery

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[1] Sengel-Turk CT, Gumustas M, Uslu B, Ozkan SA. A Novel Approach For Drug Targeting: Core-shell Type Lipid-polymer Hybrid Nanocarriers. In: Grumezescu AM. (Ed). Design of Nanostructures for Theranostics Applications, Elsevier, Mew York, 2018, pp. 69-107.

[2] Mandal B, Bhattacharjee H, Mittal N, Sah H, Balabathula P, Thoma LA, Wood GC. Core-shell type lipid-polymer hybrid nanoparticles as a drug delivery platform. Nanomed Nanotechnol Biol Med. 2013; 9: 474-491. [CrossRef]

[3] Cheow WS, Hadinoto K. Factors affecting drug encapsulation and stability of lipid-polymer hybrid nanoparticles. Coll Surf B Biointer. 2011; 85: 214-220. [CrossRef]

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