Drug Delivery Asia

This special issue of Current Drug Delivery combines the research topics presented during Controlled Release Asia Meeting 2018 in Singapore (24th & 25th September 2018, Venue: Matrix Building – Biopolis, Singapore), hosted by the Australian chapter of Controlled Release Society, co-organized and supported by Core-NET (Controlled Release and Encapsulation Network led by Agency for Science, Technology and Research (A*STAR) at Singapore) and regional Chapters of the Controlled Release Society. The issue is entitled “Drug Delivery Asia”; however, the content is not limited to the Asian research. The meeting provided an excellent opportunity for knowledge exchange between participants from Asia and around the world. This issue contains contributions from a variety of areas in the field of drug and vaccine delivery.

The large number of biological active compounds failed to be developed into drugs due to their poor bioavailability [1]. Many of them, like genes, peptides and proteins, are too large and too hydrophilic to pass biological membranes [2]. Especially, oral absorption and poor in vivo stability are major hurdles that have to be overcome for biological active compounds to reach clinical trials [3, 4]. Problem with off target delivery of drugs is the other common hindrance. To overcome all these obstacles variety of drug and vaccine delivery systems have been developed. The drug and vaccine candidates can be modified by conjugation with lipidic moieties to balance their hydrophobicity resulting in improved passive diffusion and uptake into the lymphatic system [5-7]. In contrast, the saccharide moieties can be conjugates to reduce excessive hydrophobicity of compounds and improve their water-solubility, or to utilise active transport systems using certain receptors ability to recognize saccharides and uptake them into the cells, or utilize to target the drug to the desired site of action [8-11]. Improved bioavailability of the large or hydrophilic molecules can be also achieved with the help of formulations and by the use of cell penetrating peptides [12, 13], surfactants [14, 15], or polyelectrolytes (such as alginate or chitosan) [16]-[19]. Nanotechnology-based approaches are also becoming extensively popular in the drug and vaccine delivery field [20-22]. These strategies take advantage of nanomaterials ability to a) selectively deliver a therapeutic agent to the desired tissue [23, 24], b) protect a cargo from harsh environment (e.g. in stomach) and enzymatic degradation (in intestine, blood) [25, 26], c) improve compounds uptake by immune cells when desired, or reduce this uptake [27, 28], d) allow variety of delivery pathways including oral [29, 30], intranasal [31-33] and intradermal [17, 34, 35].

This Current Drug Delivery issue comprises both original research reports and review papers focused on the various aspects of delivery systems mentioned above. The review articles describe the role of carbohydrates in vaccine delivery and development (Aljohani et al.), as well as targeted gene delivery (Begum et al.). Intrapерitoneal (Padmakumar et al.) and oral (Hussain et al.) delivery strategies of the common chemotherapeutic agent paclitaxel are discussed. The original research articles describe also the utilization of nanotechnology in amphotericon delivery (Tiyaboonchai et al.) and application of magnetic nanoparticles for tracking inflammation in the epileptic rat brain (Eyal et al.). The role of polysaccharide chitosan in nanoparticles-based drug delivery (Hamid et al. and Sahudin et al.) and the application of lipophilic tocopherol-based carrier for co-enzyme Q10 formulation (Boyd et al.) are also presented. Finally, oral delivery of antibiotic sirolimus (C.) and the role of mucilages as pharmaceutical excipients (Gugulothu et al.) are investigated.

These variety of research topics should make this issue of special interest for all the readers of Current Drug Delivery.

REFERENCES

chitosan strategies for nanoparticle drug delivery applications. Toth, I.; Skwarczynski, M. Double adjuvant.


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Professor Istvan Toth  
(Guest Editor)  
Chair in Biological Chemistry,  
School of Chemistry & Molecular Biosciences,  
Professor of Pharmacy,  
School of Pharmacy,  
University of Queensland  
Chemistry Blg #68,  
St Lucia, Qld 4072, Australia  
E-mail: i.toth@uq.edu.au

Dr. Mariusz Skwarczynski  
(Guest Editor)  
School of Chemistry and Molecular Biosciences  
The University of Queensland  
St Lucia, QLD 4072, Australia  
E-mail: m.skwarczynski@uq.edu.au