

Stephenson School of Biomedical Engineering Seminar Series Presents

Emerging Nanosystems in Drug Delivery: It's all about delivery



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1:30 PM

Rawl Engineering Practice Facility, Room 200

Dr. RaviKumar received his PhD in Drug Delivery from Indian Institute of Technology, Roorkee, in 2000. Prior to joining TAMU as a Professor of Pharmaceutics on 11/2013, he was a tenured full professor at University of Strathclyde, Glasgow-UK, and Assistant Professor at National Institute of Pharmaceutical Education and Research, India. He is an internationally recognized expert in the field of drug delivery, and his research has won him several awards including the British Pharmaceutical Conference Science Medal; Tom Gibson Memorial Award by British Society of Plastic Surgeons & the Royal College of Physicians and Surgeons; Indian National Science Academy Medal for Young Scientists. He has written over 90 articles; edited/co-edited 6 journal special issues and 3 books; chair/co-chair-6 conferences/workshops; editorial board member of several international journals; invited/keynote speaker on over 130 occasions; raised over \$4 million in external research funding; trained over 50 researchers that include 14 postdocs, 7 PhDs and 20 MS students. He was awarded Alexander von Humboldt Research Fellowship, Germany (2002). He was appointed to Guest Professor/Distinguished Foreign Professor at Seoul National University (South Korea); University of Navarra (Spain); University of Torino (Italy) and Shandong University, (China).

The nano-scale systems are predicted to have an enormous impact on next-generation health care technologies such as point-of-care diagnostics and ligand-receptor-mediated drug delivery. This presentation will highlight a progression of drug delivery strategies to address clinically challenging problems, where efforts are directed towards customizing needs for the drug and the disease in question. We have a special interest in the study of nano-scale systems for oral drug delivery of poorly soluble and permeable compounds. Recently, we have developed the next-generation non-competitive active delivery systems. In order to achieve non-competitive targeting, we have used gambogic acid (GA), a small molecule pigment of gamboge resin, as a targeting ligand for the transferrin receptor (TfR), a target receptor expressed at high levels in the small intestine barriers. Our recent work involved the synthesis of precision-polyesters (P2s) for ligand-receptor stoichiometry optimization and develops a comprehensive toolbox to allow for controlled access of desired structures. The significant body of data over the years not only provides a strong basis for a new paradigm in nanomedicine research, but will also open up novel, broadly applicable, and clinically relevant regimens for various diseases and associated complications. The success of ongoing projects will further open up new avenues in receptor mediated oral delivery of difficult to deliver compounds that constitute about 40% of the new chemical entities requiring specialized delivery systems.