



Pharmaceutical Sciences Seminar

Wednesday, October 7, 2020

Join Zoom Meeting

<https://umich-health.zoom.us/j/95949238058>

Meeting ID: 959 4923 8058 - Passcode: 629562

4:00-5:00 pm

"Targeting drugs in the vascular system"

Presented by:



Vladimir Muzykantov

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Abstract: Endothelial cells lining the vascular lumen represent key target or/and barrier for drug delivery in a plethora of human maladies. Some of these diseases have no effective pharmacotherapy, in part due to inadequate drug delivery to intended site of action. Coupling to ligands of vascular surface determinants provides control of endothelial targeting, uptake, traffic and effects of drugs. Design parameters modulating targeting include: i) ligand nature, affinity and conjugation; ii) carrier's size, shape and plasticity; iii) its pharmacokinetics; and, iv) configuration of multi-molecular assembly of targeted carrier (valence, ligand's steric freedom). Biological factors modulating targeting include: i) location, accessibility, surface density and clustering of target molecules; ii) perfusion, permeability, and functional status of the target tissue; and, iii) functional consequences of anchoring to target. Permutations of design and biological factors yield multifaceted and diversified means for vascular drug delivery. Further, drugs and nanocarriers loaded on red blood cells transfer effectively to vascular cells in target organs. endothelial targeting of antioxidant, anti-thrombotic and anti-inflammatory agents provides beneficial effects unrivaled by untargeted counterparts in animal models of human diseases including acute lung injury, ischemia-reperfusion and sepsis. Current studies aim to define mechanisms and utility of "vascular nanomedicine".

Speaker's biography: Vladimir Muzykantov (MD from First Moscow Medical School, 1980 and Ph.D. in Biochemistry from Russian National Cardiology Research Center, 1985), joined PENN in 1993 and in 2010 became a Professor and Vice-Chair of the Department of Systems Pharmacology and Translational Therapeutics. In 2010 he established the PENN Center for Targeted Therapeutics and Translational Nanomedicine, which he directs. He published ~250 papers and edited a book "Biomedical Aspects of Drug Targeting" (Kluwer, 2003). Honors include: AHA Established Investigator (1996), AHA Bugher Stroke Award (2000), Chair of Transatlantic Airway Conference on Targeting Molecular Signatures in Lungs (Luzerne, 2009), Gordon Conference on Drug Carriers (2012) and HLBI Division of Lung Diseases Workshop "Precision Therapeutics Delivery for Lung Diseases" (2014), Keynote Speaker Annual Italian Society of Biochemistry and Molecular Biology Conference (2015). His research focuses on drug delivery by red blood cells and endothelial targeting for treatment inflammation, thrombosis and ischemia.