manitoba neuroscience network

Using down-sized approaches to the big challenge of drug delivery to the brain

SEMINAR & VISITING SPEAKER SERIES

DATE
Friday, May 27, 2022
9:00AM

ZOOM LINK
https://us02web.zoom.us/j/83594461654?pwd=cGR6OW96WTVGSkFXRDE5MGRKaDNXZz09

MEETING ID
835 9446 1654

PASSCODE
771772

SPEAKER
Dr. Donald Miller, PhD

Professor, Department of Pharmacology & Therapeutics, University of Manitoba

BIO

Dr. Don Miller is a Professor in the Department of Pharmacology and Therapeutics and a principle investigator in the Neuroscience Research Group in the Kleysen Institute of Advanced Medicine. Dr. Miller received his PhD in Pharmacology and Therapeutics from the University of Kansas (1991) and following a postdoctoral fellowship in Pharmaceutical Chemistry at the University of Kansas joined the Department of Pharmaceutical Sciences at the University of Nebraska Medical Center as an Assistant Professor (1993). He was recruited to University of Manitoba in 2005. Dr. Miller's research interests are in CNS drug delivery and the development of approaches to more effectively treat brain pathologies using both small molecules and more recently, biological and nanoparticle formulations. His research has also focused on the brain microvessel endothelial cells that form the blood-brain barrier and cellular factors that influence both transporter and barrier properties. Dr. Miller is invovled in the Canadian Society of Pharmacology and Therapeutics, serving as Treasurer and member of the Board of Directors. He is also involved in the NanoMedicine Innovation Network (NMIN) a Canada wide network of researchers dedicated to advancing nanomaterials and training of HQP, where he serves on the HQP advisory committee.

RESEARCH

The brain microvessels that form the blood-brain barrier (BBB) have unique biochemical and anatomical characteristics that are important for maintaining brain function. However these same properties limit the permeability of many therapeutic agents and prevent adequate treatment of CNS disorders. Focusing on drug delivery applications for brain tumors we are examining how the brain tumor microenvironment can influence permeability of the BBB. Studies using a dynamic microfluidic co-culture model of the BBB demonstrate how secreted factors from the tumor can influence barrier function and how this model may be used to identify characteristics of both passive and restrictive tumor microenvironments. In addition, our most recent work using lipid nanoparticles to safely and effectively knockdown gene targets in brain tumor cells will be presented along with a potential method for delivery of the nanoparticles across the BBB using transient modulation of BBB permeability through the cadherin junctions of the brain endothelial cells.

OBJECTIVES

1. Understand the characteristics of the blood-brain barrier and factors influencing permeability

2. Examine how modulation of cadherin interactions can alter blood-brain barrier permeability

3. Evaluate effectiveness of cadherin modulation as an approach to enhance delivery of therapeutics to the brain

For more information:

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