

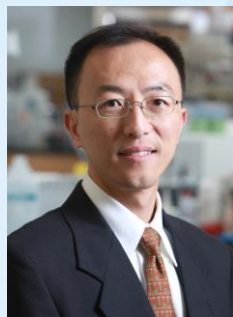
SEMINAR
北京大学工学院



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力学科学与工程系

湍流与复杂系统国家重点实验室

Bioengineered perfused human brain microvasculature to model brain tumor and neurodegenerative diseases



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地 点 北大工学院1号楼210室

内容介绍: Blood vessels play an increasingly important role in most human tissue and organ systems. Importantly, vascular niche was found to be a key element of many stem cell environments such as neural stem cells and cancer stem cells. Vascular cells not only form conduits to deliver nutrient and oxygen, but also provide instructive signals to control stem cell self-renewal and differentiation, therefore, is critical for tissue regeneration. The mission of Vascular Bioengineering Laboratory is to integrate bioengineering approaches with stem cells and vascular biology to understand blood vessel regeneration and vascular disease processes, and to develop novel therapeutic modalities to treat vascular-related disorders such as cardiovascular, neurovascular and cancer. Toward this goal, our lab has developed the method to bioengineer human brain microvascular network consists of human brain endothelial cells, pericytes and astrocytes. We have shown that interstitial flow promotes lumen formation, interconnectivity and astrocytes association of the bioengineered vasculature and maintains blood brain barrier (BBB) functions. Furthermore, perfused bioengineered vasculature enhances neural stem cell self-renewal and neuronal differentiation and maturation. We have also shown that brain vascular niche supports the infiltrative behavior of glioma stem cells, and glioblastoma dormancy, which contributes to chemo resistance. In this talk, I will present research projects on the bioengineer 3D human brain vascular network and its application in neural stem cell and brain tumor research.

报告人介绍: Dr. Dai is currently a Professor in the Department of Bioengineering at Northeastern University. Dr. Dai received his B.S. in Mechanical Engineering from Peking University, Ph.D. in Biomedical Engineering from MIT's HST Program (Harvard-MIT Division of Health Science and Technology). He completed his Post-doctoral training in Vascular Biology at Harvard Medical School. Current research in his lab focuses on the 3-D bioprinting technology, stem cells and vascular bioengineering, and are funded by major grants from NSF, NIH, DoD, NASA and American Heart Association. Dr. Dai received the Scientist Development Award from American Heart Association, NSF Career Award, Rising Star Award from Biomedical Engineering Society, Institute's Faculty Career Award (RPI), College of Engineering Faculty Fellow (Northeastern) and CAB Mid-Career Award. He is the elected Fellow of American Heart Association (FAHA), and Fellow of American Institute for Medical and Biological Engineering (AIMBE). He has served as the Chair of BMES's Cellular Molecular Bioengineering Society, and now serves on BMES Board of Directors.

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