SESSION LECTURE

No.31

Mapping the Brain: Understanding its Functions and Dysfunctions

Room: Swan Room 1

Co-Chairs:
Yu-Chun Tang

David Elmenhorst

Day 2 October 20th (Sunday) 14:00 – 17:30		
Time	**Speaker**	**Title**
14:00-14:25	**Ling-Zhong Fan** Institute of Automation, Chinese Academy of Sciences, China	Mapping the human brain: What is the next frontier?
14:25-14:50	**David Elmenhorst** Forschungszentrum Jülich, Germany	Mapping synaptic density and its plasticity in the living human brain
14:50-15:15	**Jiao-Jian Wang** Institute of Primate Translational Medicine, Kunming University of Science and Technology, China	Brain connectivity atlas mapping and precision neuromodulation
15:15-15:40	**Dogu Baran Aydogan** A.I. Virtanen Institute for Molecular Sciences, University of Eastern Finland, Finland	Tractography's path from challenges to novel applications
15:40-16:10	**Tea Break**	
16:10-16:35	**Yu-Chun Tang** Cheeloo College of Medicine, Shandong University, China	Mapping the brainstem: understanding its structure and function
16:35-17:00	**Lu Zhao** Keck School of Medicine, University of Southern California, USA	Neuroimaging-omics for understanding brain development and aging
17:00-17:25	**Cong-Ying Chu** Institute of Automation, Chinese Academy of Sciences, China	The increased brain age after sleep deprivation and its underlying mechanism

Yu-Chun Tang

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Professor and Deputy Director of the Department of Anatomy and Neurobiology, Cheeloo College of Medicine, Shandong University, Vice Chairman of the Branch of Sectional and Imaging Anatomy of CSAS. He worked as postdoc & Research Associate at the Mark and Mary Stevens Neuroimaging and Informatics Institute,USC. His research interests include sectional and imaging anatomy, human brain atlas, and computational medicine. Currently,he aim to deepen understanding of the brainstem using advanced imaging and biological methods, especially the development and gene expression of brainstem and the imaging biomarker and biological mechanisms of brainstem-related neurological and psychiatric disorders.

Ling-Zhong Fan

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Professor at Brainnetome Center,Institute of Automation, Chinese Academy of Sciences. His research seeks to develop a comprehensive human brain atlas using advanced non-invasive imaging techniques like diffusion and functional MRI, and focus on comparing connectivity-based brain maps across different modalities to understand functional brain states. Additionally, he evaluate individual brain parcellation reliability and its relationship with interindividual variability. By integrating data from non-human primates and diverse methodologies, he aim to deepen understanding of the biological foundations of the human brain atlas,advancing our knowledge of brain structure and function.

Jiao-Jian Wang

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Professor at State Key Laboratory of Primate Biomedical Research, Institute of Primate Translational Medicine, Kunming University of Science and Technology (KUST). He worked as a post-doctor in University of Pennsylvania and Children's hospital of Philadelphia,and joined KUST in 2022. His primary research topics include brain connectivity atlas, cross-species brain evolution, precise neuromodulation for brain disorders and translational medicine researches. He is also interested in brain network changes after perturbation stimulation (such as TMS, DBS, and ECT).

Cong-Ying Chu

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Associate research fellow at Brainnetome Center, Institute of Automation, Chinese Academy of Sciences. Using advanced multimodal neuroimaging techniques, he is interested in investigating the effects of both chronic and acute sleep deprivation on the human brain in healthy volunteers. People's reactions to lack of sleep can vary significantly. Therefore, he utilized neuroimaging data to analyze the individual differences in responses to sleep deprivation. Moreover, he specifically studied the disparities in the neural mechanisms underlying sleep deprivation versus insomnia from the perspective of brain networks.

David Elmenhorst

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Professor and Principal Group Leader of Institute of Neurosciences and Medicine (INM), Forschungszentrum Jülich. A focus of his work is to elucidate the mechanisms underlying therapeutic sleep deprivation in depressed patients. The hypothesis is that synaptic strength increases during wakefulness and that synaptic dysregulation influences long-term potentiation in patients with major depressive disorder. The aim of the project is to investigate the synaptic basis of the antidepressant effect of therapeutic sleep deprivation. Using PET, synaptic vesicle protein 2A (SV2A) will be examined as a measure of synaptic density in patients and healthy controls before and after sleep deprivation.

Dogu Baran Aydogan

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Academy Research Fellow and group leader of A.I. Virtanen Institute for Molecular Sciences,University of Eastern Finland. His Ph.D. at Tampere University of Technology focused on using computational geometry and graph theory techniques to study connectivity, aiming to link the microstructural properties of materials and tissues with their physical properties. As a postdoctoral researcher at the LONI at USC, he studied brain's structural connectivity and developed new techniques for analyzing white matter connections. Currently, his research continues to focus on diffusion MRI-based tractography and explores the emerging field of connectivity- based brain stimulation.

Lu Zhao

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Assistant Professor of Neurology at the Stevens Institute for Neuroimaging and Informatics, University of Southern California (USC), USA. He received his Ph.D. in medical image analysis at the Tampere University of Technology, Finland, and worked as postdoctoral scholar at the Montreal Neurological Institute, Canada and USC, USA. his research aims to provide definitive models of brain-gene-environment interactions that explain the neurobiological mechanisms of brain development, aging, and the neuropathology of major neurodevelopmental and neurodegenerative disorders.