

SCIENTIFIC PROGRAM

SESSION LECTURE

No.17

Protein Phase Separation and Phase Transition in Human Diseases
Room: Dong Yu Grand Ballroom 3

Co-Chair:
Cong Liu



Markus Zweckstetter



Day 2 October 20th (Sunday) 14:00 – 17:30

Time	Speaker	Title
14:00-14:30	Markus Zweckstetter University of Göttingen, Germany	Biomolecular Condensation in Neurodegeneration
14:30-15:00	Xin Zhang Westlake University, China	Chemical Biology of Biomolecular Condensates
15:00-15:30	Nobuo Noda Hokkaido University, Japan	Protein Phase Separation in Autophagy Regulation
15:30-16:00	Tea Break	
16:00-16:30	Pilong Li Tsinghua University, China	Harnessing Degradation Condensates for the Clearance of Difficult-to-target Proteins
16:30-17:00	Jiajie Diao University of Cincinnati College of Medicine, USA	Synuclein Condensates in Synaptic Transmission
17:00-17:30	Cong Liu Interdisciplinary Research Center on Biology and Chemistry, CAS, China	Development of an α -synuclein PET Tracer for Clinical Diagnosis of Parkinson's Diseases



Cong Liu

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Dr. Cong Liu is the Principal Investigator at Interdisciplinary Research Center on Biology and Chemistry, Chinese Academy of Sciences. His research focuses on protein phase separation and pathological aggregation in neurodegenerative diseases (NDs) with systematic achievements during his independent research career since 2013. In brief, by combining cutting-edge chemical and biological approaches, Dr. Liu revealed the structural basis of protein pathological aggregation in NDs; demonstrated the regulation mechanism of protein aggregation by disease-related chemical modification; explained at the atomic level how small molecules bind to pathological amyloid fibril; developed new strategies of small molecules modulating protein phase separation for therapeutic application.



Markus Zweckstetter

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Prof. Zweckstetter is a senior group leader at DZNE, one of the largest institutes worldwide that has a clear and strong focus on developing novel therapies against Alzheimer's Disease. In addition, he is heading a research group at the Max Planck Institute for Multidisciplinary Sciences, and is a full professor at the University Medical School Göttingen, thus he belongs to three world-class institutions. Prof. Zweckstetter has obtained several highly prestigious grants during his career, including two excellence grants from the German Science Foundation and four ERC grants including two ERC Advanced Grants (LLPS-NMR, PhaseKin).



Pilong Li

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Dr. Pilong Li is the Professor of School of Life Sciences, Tsinghua University. His lab is dedicated to elucidate the roles of liquid-liquid phase separation (LLPS) in many biological pathways and also the roles of aberrant LLPS in various diseases including cancer and neurodegenerative diseases. He is developing LLPS-based biochemical assays for investigation molecular interactions in vitro and in vivo.



Nobuo Noda

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Dr. Nobuo Noda is the professor at Institute for Genetic Medicine, Hokkaido University. He mainly focuses on elucidating the molecular mechanisms of autophagy-essential conjugation reactions, autophagy selectivity, and autophagy initiation. Autophagy is an intracellular degradation system that involves de novo generation of autophagosomes. We have shown by in vitro reconstitution and structural biology that phase separation of Atg proteins organizes the site of autophagosome formation in budding yeast. Furthermore, we found that Atg protein condensates formed by phase separation promote enzymatic reactions important for autophagy progression. We are also analyzing the role of phase separation in mammalian autophagy, which is mechanistically different from yeast autophagy.



Xin Zhang

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Xin Zhang is the Professor of Chemistry at the Westlake University, Hangzhou. Prior to joining the faculty at Westlake, Zhang was the Paul & Mildred Berg Early Career Professor and associate professor of chemistry and of biochemistry and molecular biology at the Pennsylvania State University. Zhang's research is focused on the chemistry of biological aggregates formed by proteins and RNAs under physiological and pathological conditions. Zhang's work has received multiple awards, including NSF CAREER award, NIGMS MIRA, Pew Scholar in the Biomedical Sciences, Sloan Research Fellowship, the Burroughs Wellcome Fund Career Award at the Scientific Interface.



Jiajie Diao

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Dr. Jiajie Diao is an Associate Professor at the University of Cincinnati College of Medicine. He has pioneered a series of biophysical and biochemical methods to investigate membrane fusion at the single-particle level. His work has also led to the development of multiple molecular probes and superresolution assays, enabling quantitative analysis of sub-cellular dynamics. In addition, Dr. Diao employs single-molecule biophysical tools and molecular dynamics simulations to systematically study the functional and conformational dynamics of alpha-synuclein, a protein closely linked to Parkinson's disease. His research also includes applying single-molecule FRET techniques to study DNA modifications and the interactions between DNA and proteins.