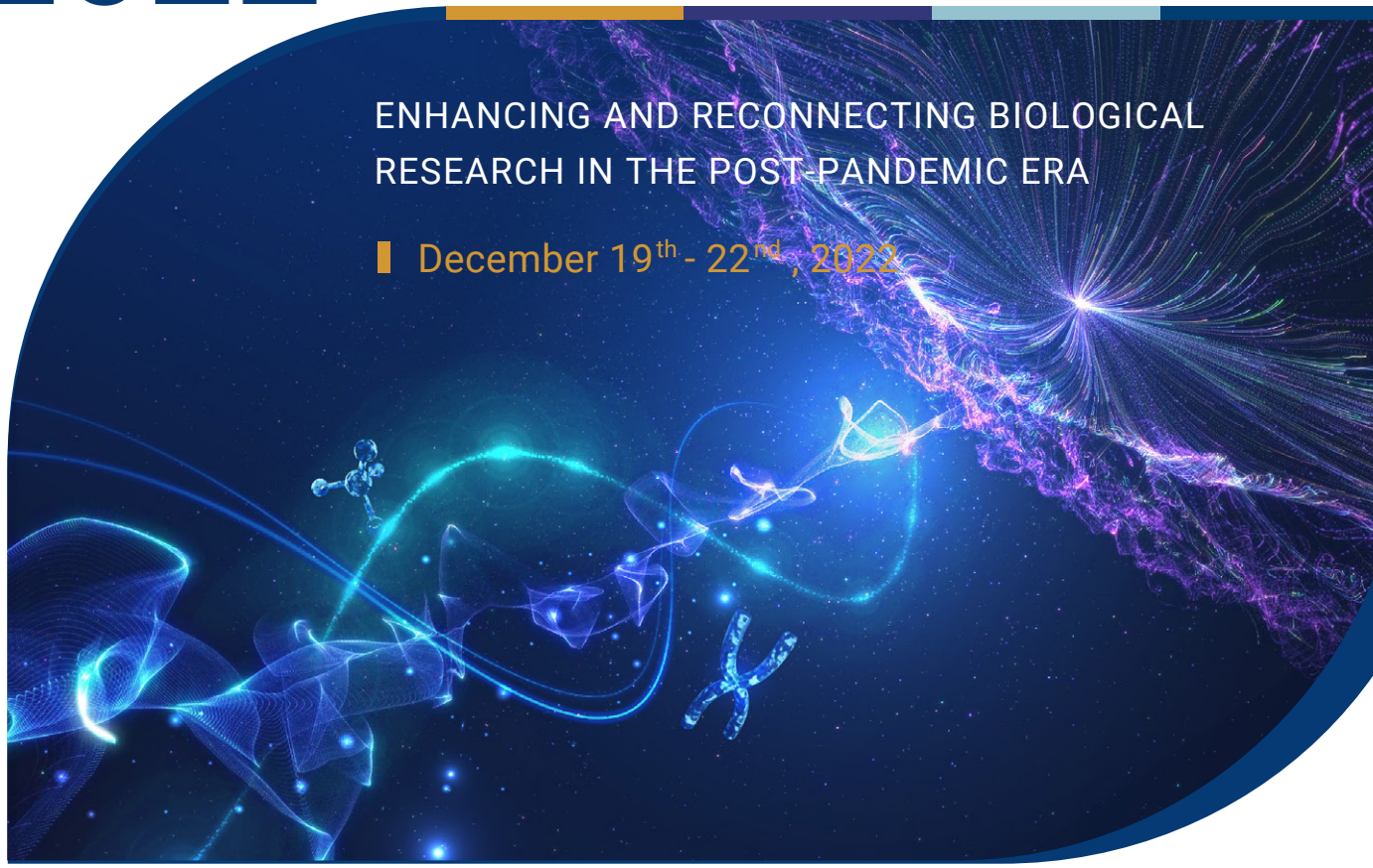
西湖大学 WESTLAKE UNIVERSITY

WESTLAKE LABORATORY 西湖实验室

CHINESE BIOLOGICAL INVESTIGATORS SOCIETY CBIS

2022 13TH BIENNIAL MEETING

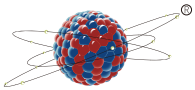


Cosmopolitan Hotel
Las Vegas, Nevada
U.S.A

×

Yungu Campus
Westlake University
Hangzhou, China

EXHIBITORS



诺海生命科学
Nuohai Life Science

BECKMAN COULTER
Life Sciences

ZEISS
Seeing beyond

BIOGROUP

西湖生物医药
Westlake Therapeutic

佰欧生物
BAIOU BIOLOGICAL

生科仪器
Life science instrument

CONTENTS

WELCOME MESSAGE

On behalf of Westlake University and the Chinese Biological Investigators Society (CBIS, 华人生物学家协会), we wholeheartedly welcome you to Westlake University Yungu Campus and thank you for joining us for the CBIS 2022 13th Biennial Meeting. The event is a collaboration between CBIS, Westlake University and Westlake Laboratory, with this year's focus being on 'Enhancing and Reconnecting Biological Research in the Post-Pandemic Era'.

We have prepared a diverse program of topics covering basic and translational research in life sciences as well as new technological developments. We have invited distinguished speakers and guests from the forefront of biological research and top institutions from around the world, consisting of prominent figures in life sciences and outstanding investigators at all stages of their careers. Talks will be delivered live and in-person from Hangzhou, China and Las Vegas, USA.

The program features 2 keynote speeches, 8 society (plenary) presentations, and 24 local Hangzhou talks available exclusively to the Yungu Campus audience. The Hangzhou talks are arranged into four key sessions, with each session covering different fields of life sciences: (1) cancer, metabolism and regeneration; (2) infection and immunity; (3) neurobiology and systems biology; (4) epigenetics and RNA biology. In addition, the program also features a 'Meet the Editors' forum with special guests from ***Cell Research***, ***Nature***, and ***Cell***, as well as several activities to let you enjoy the beauty of Hangzhou and explore Westlake University's brand new Yungu Campus.

Our goal for CBIS 2022 is to provide you with a unique platform with which you can connect and interact with scientists who share the same passion for life sciences as you do, and help you explore new prospects for academic and industrial collaborations. It is our hope that you will find the event both fulfilling and stimulating, and that the interactions you have and the friends that you make here, will prove to be invaluable in your future endeavours.

Westlake University is a new, non-profit and research-oriented university organized with civil commitment and the support of the country. By building world-class research programs and centers, Westlake University School of Life Sciences strives to pursue questions fundamental to our understanding of biology and disease and to develop enabling technologies that benefit humanity and advance human health.

CBIS, formally known as the Ray Wu Society, was established to honor Dr. Ray Wu's significant contributions in the advancement of Biochemistry and Plant Biotechnology, as well as his outstanding leadership in developing the Sino-America overseas student program known as CUSBEA. To extend Dr. Wu's legacy, CBIS strives to promote scientific communications among Chinese scientists both internationally and in China.

We wish you all a memorable experience at CBIS 2022 and Westlake University Yungu Campus, and would like to once again sincerely thank you for being a part of enhancing and reconnecting biological research in the post-pandemic era.

Yours sincerely,
CBIS 2022 Hangzhou Site Organizing Committee

Dr. Ling-ling Chen
Center for Excellence in Molecular Cell Science, Chinese Academy of Sciences

Dr. Dangsheng Li
Cell Research and Center for Excellence in Molecular Cell Science, Chinese Academy of Sciences

Dr. Feng Shao
National Institute of Biological Sciences, Beijing

Dr. Hongtao Yu
Dean, School of Life Sciences, Westlake University

AGENDA

DAY1 MONDAY DEC 19, 2022

- 12:00-17:00 **Registration**
- 18:00-20:00 **Welcome Banquet**
  1F, Westlake Hall, Wassim Hotel

END OF DAY 1

DAY2 TUESDAY DEC 20, 2022

SESSION 1

- 08:30-09:00 **Reception**
- 09:00-09:15 **Group Photo**
- 09:30-09:45 **Opening Remarks (from Las Vegas)**
- 09:45-10:00 **Opening Remarks (from Hangzhou)**
  Dr. Yigong Shi
- 10:00-11:00 **Keynote Lecture | Live from Las Vegas site**
  Dr. Vishva Dixit
  Why So Many Ways to Die?
- 11:00-12:00 **Keynote Lecture | Live from Hangzhou site**
  Dr. Xiaoliang (Sunney) Xie
  Single-cell Genomics: Coming of Age for Biology and Medicine
- 12:00-13:00 **Lunch**
  1F, Jiang-Nan Hall, Wassim Hotel

SESSION 2

Cancer, Metabolism and Regeneration

- 13:00-13:20 **Hangzhou Talk #1 | Session Chair**
  Dr. Shang Cai
  The Lurking Culprit of Cancer in the Bac-ground
- 13:20-13:40 **Hangzhou Talk #2 | Session Chair**
  Dr. Ting Chen
  Skin Regional Differences in Regeneration and Autoimmune Disease
- 13:40-14:00 **Hangzhou Talk #3**
  Dr. Peng Du
  A Plant Immune Protein Enables Broad Antitumor Response by Rescuing MicroRNA Deficiency
- 14:00-14:20 **Hangzhou Talk #4**
  Dr. Chong Liu
  A Novel Genetic Disease Models to Dissect the Molecular Mechanism and to Visualize the Initiation and Progression of Glioma
- 14:20-14:40 **Hangzhou Talk #5**
  Dr. Wei Mo
  Endogenous Retrovirus in Stem Cells
- 14:40-15:00 **Hangzhou Talk #6**
  Dr. Ben Lu
  Programmed Cell Death and Critical Illness
- 15:00-15:05 **Sponsor: Nuohai Life Science（Shanghai）Co.,Ltd**
- 15:05-15:30 **Break**

SESSION 3

Infection and Immunity

- 15:30-15:50 **Hangzhou Talk #7 | Session Chair**
  Dr. Ting Zhou
  Synthetically Tuning IL-18 Pathway for Cancer Immunotherapy
- 15:50-16:10 **Hangzhou Talk #8 | Session Chair**
  Dr. Chenqi Xu
  Enhancing CD3 Diversity to Improve CAR-T Cell Persistence
- 16:10-16:30 **Hangzhou Talk #9**
  Dr. Meng Xu
  Targeting RNA Modification Machinery as New Therapeutic Modalities for Cancer
- 16:30-16:50 **Hangzhou Talk #10**
  Dr. Xiangxi Wang
  Viral Structure, B Cell Repertoire and Vaccine Design
- 16:50-17:10 **Hangzhou Talk #11**
  Dr. Ling-juan Zhang
  Discovering the Innate Immune Antimicrobial Function of Dermal Fat

- 17:10-17:30 **Hangzhou Talk #12**
  Dr. Xiufang Xin
  Understanding Plant-pathogen Interactions in the Phyllosphere
- 18:00-20:00 **Dinner**

END OF DAY 2

DAY3 WEDNESDAY DEC 21, 2022

SESSION 1

- 06:50-07:00 **Reception**
- 07:00-07:40 **Society Lecture | Live from Las Vegas site**
  Dr. Haifan Lin
  Uniting the Genome: Novel Functions of the Piwi-piRNA Pathway in the Germline
- 07:40-08:20 **Society Lecture | Live from Las Vegas site**
  Dr. Guo-li Ming
  Applying Novel Technologies to Understand Neurodevelopment and Neurological Disorders - A DISC1 Story
- 08:20-08:40 **Break**

Session Chair: Dr. Ren Sun

- 08:40-09:20 **Society Lecture | Live from Hangzhou site**
  Dr. Hai Qi
  Germinal Ccenters and Long-lived Humoral Immunity
- 09:20-10:00 **Society Lecture | Live from Hangzhou site**
  Dr. Hailan Hu
  From Pecking Order to Ketamine – Neural Mechanism of Social and Emotional Behavior
- 10:00-11:00 **Poster Session**
- 11:00-12:00 **Lunch**
  1F, Jiang-Nan Hall, Wassim Hotel

Meet the Editors

Host: Dr. Dangsheng Li

- 12:00-13:00 **Meet the Editor | Live from Hangzhou site**
  Dr. Jie Wang
  Science Publishing - behind the Scenes at *Nature*

- 13:00-14:00 **Meet the Editor | Live from Hangzhou site**
  Dr. Jiaying Tan
  Publishing at *Cell*

SESSION 2

Neurobiology and Systems Biology

- 14:00-14:20 **Hangzhou Talk #13 | Session Chair**
  Dr. Yulong Li
  Spying on Neuromodulation by Constructing New Genetically-encoded Fluorescent Sensors
- 14:20-14:40 **Hangzhou Talk #14 | Session Chair**
  Dr. Boxun Lu
  The Gelation of Cytoplasmic CAG Repeat Expansion RNAs Suppresses Global Protein Translation
- 14:40-15:00 **Hangzhou Talk #15**
  Dr. Xiaoqun Wang
  Human Neural Progenitor Diversity during Cortical Development
- 15:00-15:20 **Hangzhou Talk #16**
  Dr. Tian Xue
  Light and Life – Not Just for Seeing
- 15:20-15:40 **Hangzhou Talk #17**
  Dr. Xiaohong Xu
  A Hippocampal-hypothalamic Circuit Essential for Anxiety-related Behavioral Avoidance
- 15:40-16:00 **Hangzhou Talk #18**
  Dr. Cong Liu
  Mechanistic View of α-synuclein Pathological Aggregation in Parkinson's Disease
- 16:00-16:05 Sponsor: **Beckman Coulter Life Sciences**

TOUR

- 16:05-18:30 **Hangzhou Scenic Spot Visit (optional)**
- 18:30-20:30 **Dinner**

END OF DAY 3

DAY4 THURSDAY DEC 22, 2022

SESSION 1

- 06:50-07:00 **Reception**
- 07:00-07:40 **Society Lecture | Live from Las Vegas site**
  Dr. Zhijian 'James' Chen
  TBD

- 07:40-08:20 **Society Lecture | Live from Hangzhou site**
  Dr. Yanli Wang
  How Does CRISPR-Cas9 Cut DNA and Be Inhibited by Acrs?
- 08:20-08:40 **Break**

Session Chair: Dr. Qiufu Ma

- 08:40-09:20 **Society Lecture | Live from Hangzhou site**
  Dr. Sheng-Cai Lin
  Glucose as A Messenger Controlling Life and Death
- 09:20-10:00 **Society Lecture | Live from Hangzhou site**
  Dr. Nieng Yan
  Targeting Na_v Channels for Pain Relief
- 10:00-11:00 **Yungu Campus Tour (optional)**
- 11:00-14:00 **Lunch & Break**
  1F, Jiang-Nan Hall, Wassim Hotel

SESSION 2

Epigenetics and RNA Biology

- 14:00-14:20 **Hangzhou Talk #19 | Session Chair**
  Dr. Xiaohua Shen
  The Noncoding Genomes in Transcription and Chromatin Organization
- 14:20-14:40 **Hangzhou Talk #20 | Session Chair**
  Dr. Bing Zhu
  Epigenetics: Remember the Past & Prepare for the Future
- 14:40-15:00 **Hangzhou Talk #21**
  Dr. Ruiming Xu
  Mechanism of De Novo Nucleosome Assembly
- 15:00-15:20 **Hangzhou Talk #22**
  Dr. Dong Fang
  SMYD5 Catalyzes Histone H3 Lysine 36 Trimethylation at Promoters
- 15:20-15:40 **Hangzhou Talk #23**
  Dr. Hong Cheng
  Sorting of Nascent RNAs
- 15:40-16:00 **Hangzhou Talk #24**
  Dr. En-Zhi Shen
  PIWI-interacting RNA (piRNA) and Gene Regulation
- 16:00-16:05 **Sponsor: ZEISS**
- 18:00-19:30 **Dinner**

END OF DAY 4

SPEAKERS

LAS VEGAS SITE

HANGZHOU SITE

Dr. Zhijian 'James' Chen

Professor

Department of Molecular Biology
University of Texas Southwestern Medical Center

Zhijian "James" Chen' s research into complex cellular biochemistry has led to the discovery of pathways and proteins that trigger immune and stress responses. Chen has identified proteins, such as the mitochondrial protein MAVS, that are crucial to the body' s defense against RNA viruses such as influenza and Ebola. Now, Chen and his team are dissecting a signaling pathway involving a novel DNA sensor – cyclic GMP-AMP (cGAMP) synthase, or cGAS – which activates an interferon response that may play a role in immune defense against pathogens and malignant cells, as well as in autoimmune diseases such as lupus. Treatment of these autoimmune diseases could involve chemical inhibition of cGAS, whereas cGAMP and its derivatives may be used as adjuvants for vaccines and cancer immunotherapies.

Topic TBD

Dr. Vishva Dixit

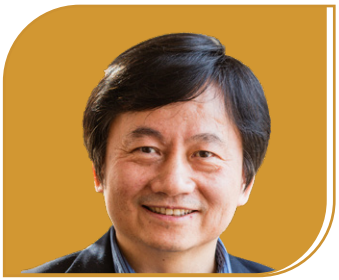
VP of Early Discovery Research & Senior Fellow

Genentech

Vishva M. Dixit is presently Vice President of Early Discovery Research at Genentech Inc. He has made many contributions to biomedicine and his early work on cell death and inflammation is prominent in introductory textbooks of biology and medicine. He began his career as a physician in Kenya, trained as a Pathologist at Washington University, St. Louis, and was on faculty at University of Michigan. Dixit's pioneering studies defined the biochemical framework illuminating many of the key components of the cell death pathway. He identified numerous proteins in the cell death cascade and determined how they functioned at a molecular level. He is a Foreign Member, European Molecular Biology Organization, a member of the National Academy of Medicine, the American Academy of Arts and Sciences, and the National Academy of Sciences.

Topic Why So Many Ways to Die?

The Eugene Higgins Professor of Cell Biology, Professor of Genetics, of Obstetrics, Gynecology, and Reproductive Sciences, and of Dermatology, Founding Director of Yale Stem Cell Center. Dr. Lin' s work is focused on the self-renewing mechanism of stem cells, using Drosophila germline stem cells, mouse germline stem cells, mouse embryonic stem cells, Hydra, and planarian stem cells as models. He also studies germline development and stem cell-related cancers.



Dr. Haifan Lin

Professor

School of Medicine,
Yale University

Topic **Uniting the Genome: Novel Functions of the Piwi-piRNA Pathway In the Germline**

Research in Dr. Guo-li Ming's laboratory centers on understanding molecular mechanisms underlying neurodevelopment and how its dysregulation may contribute to developmental neurological disorders. The lab uses a combination of experimental approaches that include molecular biology, biochemistry, mouse genetics, imaging, electrophysiology, electron microscopy, optogenetic manipulations, next generation sequencing, and behavioral tests to study neural development. We have been using two complementary model systems, the genetically modified mouse system and patient-derived induced pluripotent stem cell (iPSC) model systems. We are interested in addressing a broad range of topics, from neuronal migration, axon and dendritic development, synapse formation, circuitry integration to plasticity of developing neurons, and functional regeneration of mature neurons.

Dr. Guo-li Ming

Professor

Perelman School of Medicine,
University of Pennsylvania

Topic **Applying Novel Technologies to Understand Neurodevelopment and Neurological Disorders - A DISC1 Story**

Dr. Shang Cai

Principal Investigator

School of Life Sciences
Westlake University

Dr. Shang Cai is currently the assistant professor in Westlake University. He received his bachelor degree of biological science in Peking University in 2003. He then went abroad to the Biochemistry Department of Indiana University for his PhD studies, working on the molecular mechanism of spindle assembly and chromosome alignment. After getting his PhD degree in 2009, he pursued his postdoc research in the Institute of Stem Cell and Regenerative Medicine, Stanford University, working on the mechanism of self-renewal and fate specification of mammary stem cell and breast cancer stem cell. He joined Westlake University as assistant professor in 2017. Dr. Shang Cai's research focused on the role of mammary stem cell in the morphological and functional integrity of the mammary gland during puberty, pregnancy and lactation, as well as the role of breast cancer stem cells in cancer initiation, evolution, drug resistance, relapse and metastasis. He has published multiple papers on *Cell*, *Science* and *Cell Stem Cell*.

Topic The Lurking Culprit of Cancer in the Bac-ground

Intratumor microbiota are present in a variety of human cancer types at relative low abundance. Their unique localization within cancer cells is an intriguing phenotype with largely unclear biological significance. We have performed functional interrogations on the physiological roles of intratumor microbiota in a spontaneous murine breast tumor and have revealed that intratumor bacteria are a crucial contributor to tumor progression and may provide potential clinical values for precision medicine.

In 2001, Ting Chen graduated from Xiamen University with a bachelor's degree in biology; in 2007, she graduated from University of Virginia with a doctorate in cell and developmental biology; from 2007 to 2012, she did her postdoctoral research at Rockefeller University, focusing on skin stem cells. Since December 2012, Dr. Ting Chen established her own lab at the National Institute of Biological Sciences in Beijing China. The main research directions in her lab are: 1. Local and systemic mechanisms regulating skin regeneration during homeostasis and diseases. 2. The regulatory mechanism of skin autoimmune diseases and immune tolerance.

Dr. Ting Chen

Principal Investigator

National Institute of Biological Sciences, Beijing

Topic Skin Regional Differences in Regeneration and Autoimmune Disease

Skin physically protects our body from the external environment. Inherent genetic defects and acquired common skin diseases that affect skin function have detrimental effect to our health or survival. The aberrant activation of immune cell activity can provoke common skin autoimmune diseases such as psoriasis and vitiligo, which are often characterized by bilateral symmetric lesions at preferred anatomic regions of the body. Understanding what orchestrates patterned cutaneous immune cell activities at the whole organ level is necessary for developing effective treatments for these diseases.

Dr. Hong Cheng

Principal Investigator

Center for Excellence in Molecular Cell Science, CAS

Hong Cheng, Ph.D., is a Professor in Shanghai Institute of Biochemistry and Cell Biology. She received his undergraduate degree from China Medical University and Ph.D. degree from Kobe University, and performed postdoctoral studies at Harvard Medical School. The Cheng lab studies how nascent RNAs are sorted into the nuclear export, degradation and retention pathways. To understand this, the lab has been focused on studying three closely related aspects of gene expression: (1) The mechanism and regulation of nascent RNA sorting; (2) The complex interconnection between transcription, pre-mRNA processing and nuclear export; (3) Mechanisms and biological function of nuclear RNA degradation. Through these studies, the lab aims to reveal how the fate of nascent RNAs is determined and to understand the functional importance of RNA sorting.

Topic Sorting of Nascent RNAs

Proper sorting of nascent RNAs to the productive or the destructive pathways is fundamental for ensuring accurate and precise gene expression. Nuclear speckles (NSs) are dynamic sub-nuclear structures with irregular shape present in most mammalian cells. Our recent work has suggested their roles in nascent RNA sorting. I will talk about our most recent work on NS morphology regulation and their functions in sorting RNAs for nuclear export.

I am an assistant Professor in the College of Life Sciences at Peking University, and Principal Investigator in Peking-Tsinghua Center for Life Sciences. I received a Ph.D. from Peking University in 2012, and my postdoctoral work was performed at Harvard Medical School. The Du laboratory was established in 2018, the research of which has focused on identification and studying on posttranscriptional RNA regulatory pathways and exploring their biological relevance in mammalian early embryonic development, ESCs and human disease. As well, I am interested in reconstitution of plant unique RNA regulatory pathways in mammalian cells and exploring its potential applications in medicine.

Dr. Peng Du

Principal Investigator

Peking Universtiy

Topic A Plant Immune Protein Enables Broad Antitumor Response by Rescuing MicroRNA Deficiency

Cancer cells are featured with uncontrollable activation of cell cycle, and microRNA deficiency drives tumorigenesis. The RNA-dependent RNA polymerase (RDR) is essential for small-RNA-mediated immune response in plants but is absent in vertebrates. Here, we show that ectopic expression of plant RDR1 can generally inhibit cancer cell proliferation. In many human primary tumors, abnormal microRNA isoforms with 1-nt-shorter 3′ ends are widely accumulated. RDR1 with nucleotidyltransferase activity can recognize and modify the problematic AGO2-free microRNA duplexes with mononucleotides to restore their 2 nt overhang structure, which eventually rescues AGO2-loading efficiency and elevates global miRNA expression to inhibit cancer cell-cycle specifically. The broad antitumor effects of RDR1, which can be delivered by an adeno-associated virus, are visualized in multiple xenograft tumor models in vivo. Altogether, we reveal the widespread accumulation of aberrant microRNA isoforms in tumors and develop a plant RDR1-mediated antitumor stratagem by editing and repairing defective microRNAs.

Dr. Dong Fang

Principal Investigator

Life Sciences Institute
Zhejiang University

Dr. Dong Fang received his bachelor's degree at Tsinghua University in 2007, and received his doctor's degree at Tsinghua University in 2012. In the same year, Dr. Fang joined Mayo Clinic for his postdoctoral research. He then moved to Columbia University Medical Center as an associate research scientist in 2016. In 2018, Dr. Fang joined the Life Sciences Institute, Zhejiang University to build his research team as the principal investigator. Dr. Fang is interested in the research of epigenetics and tumors. His research is focused on how the histone modifications determine cell fate.

Topic SMYD5 Catalyzes Histone H3 Lysine 36 Trimethylation at Promoters

Histone marks, carriers of epigenetic information, regulate the gene expression. Studies have shown that H3K36me3 is mainly catalyzed by SETD2 to be deposited at gene body regions in mammalian cells. We uncover that in addition to gene body regions, H3K36me3 is enriched at promoters in native cells. Through screening, we identified SMYD5, which is recruited to chromatin by RNA polymerase II, as a methyltransferase catalyzing H3K36me3 at promoters.

Hailan Hu is Professor and Director of School of Brain Science and Brain Medicine at Zhejiang University. She received a BA in Biochemistry from Beijing University and a PhD in neuroscience (with Corey Goodman) from UC Berkeley. After a postdoc training with Roberto Malinow at CSHL, she joined the faculty of Institute of Neuroscience, Chinese Academy of Sciences. Since 2015, she has been professor at Zhejiang University. Her laboratory seeks to understand how emotional and social behaviors are encoded and regulated in the brain, with a main focus on the neural circuitry underlying depression and social dominance. Her team has identified the neural mechanism underlying the winner effect, by which individuals increase their chance of winning after previous victories. Her recent work has uncovered a new model to explain the etiology of depression and the rapid antidepressant actions of ketamine, involving NMDA receptor-dependent burst activity of lateral habenular neurons. Her work has led to the identification of several molecular targets (including bCaMKII, T-type calcium channels and astroglial Kir4.1 channel) for developing new antidepressant drugs. She is a recipient of the IBRO-Kemali International Prize and the L'Oreal-UNESCO for Woman in Science International award.

Dr. Hailan Hu

Professor & Director

School of Brain Science and Brain Medicine

Zhejiang University

Topic From Pecking Order to Ketamine – Neural Mechanism of Social and Emotional Behavior

Emotions and social interactions color our lives and shape our behaviors. Using animal models and engineered manipulations, we aim to understand how social and emotional behaviors are encoded in the brain, focusing on the neural circuits underlying dominance hierarchy and depression. This lecture will highlight our recent discoveries on how downward social mobility leads to depression; how ketamine tames depression by blocking burst firing in the brain' s anti-reward center; and, how glia-neuron interaction plays a surprising role in this process. With these results, we hope to inspire new treatment strategies for depression.

Dr. Yulong Li

Principal Investigator

School of Life Sciences

Peking University

Dr. Yulong Li got his bachelor degree at Peking University (2000) and PhD degree with Dr. George Augustine at Duke University (2006). After finishing his postdoc training with Dr. Richard Tsien at Stanford University, he set up his own lab at Peking University since 2012. His group is carrying two layers of research: first, they are developing cutting edge research tools, namely advanced imaging probes, to untangle the complexity of nervous system in space and in time; second, capitalizing on the advancement of research toolkits, they are studying the regulation of synaptic transmission, focusing on the modulation of presynaptic transmitter release in health and in disease condition. Dr. Li is awarded the 2019 National Science Fund for Distinguished Young Scholars, the "XPLORER PRIZE" by Tencent Foundation and PKU & Boehringer-Ingelheim Faculty Research Award. See more details on the Lab website: http://yulonglilab.org/

Topic Spying on Neuromodulation by Constructing New Genetically-encoded Fluorescent Sensors

Diverse neuromodulators in the brain, such as acetylcholine, monoamines, lipids and neuropeptides, play important roles in a plethora of physiological processes including reward, movement, attention, sleep, learning and memory. Dysfunction of the neuromodulatory system is associated with a range of diseases, such as epilepsy, addition, neurodegenerative and psychiatric diseases. A longstanding yet largely unmet goal is to measure the dynamics of different neuromodulators reliably and specifically with high spatiotemporal resolution, particularly in behaving animals. To achieve this goal, we develop a series of genetically encoded GPCR-activation-based (GRAB) sensors for the detection of acetylcholine, dopamine, norepinephrine, serotonin, histamine, endocannabinoids, adenosine, ATP and neuropeptides, and validate the performance of these sensors in multiple preparations in vitro and in vivo. The GRAB sensor toolbox provides new insights into the dynamics and mechanism of neuromodulatory signaling both in health and disease.

We have been interested in how glucose is sensed and regulates metabolic homeostasis. We have identified a glucose sensing pathway at the lysosome, in that the glycolytic enzyme aldolase is the sensor and transmits the signal of glucose availability to v-ATPase that serves as a central node for either activating AMPK or maintaining the activity of mTORC1. We have also identifed PEN2 as the target of metformin, revealing that the PEN2-metformin complex inhibits v-ATPase to activate AMPK for the various clinical benefits of the drug. Meanwhile, we have used aldolase as a target to screen for compounds that block aldolase from binding to its substrate FBP, and found Aldometanib as such a compound. We have shown that Aldometanib lowers blood glucose levels, alleviates fatty liver, and extends lifespan.

Dr. ShengCai Lin

Professor

School of Life Sciences
Xiamen University

Topic Glucose as a Messenger Controlling Life and Death

In this seminar, I will present our view of glucose as a messenger – independently of cellular energy levels – its absence and presence activates AMPK and mTORC1 respectively. I will also present our recent work on the identification and characterization of the molecular target of metformin, and the identification of the new drug Aldometanib.

Dr. Chong Liu

Professor

School of Brain Science and Brain Medicine, Zhejiang University

Dr. Liu is a PI of the School of Brain Science and Brain Medicine of Zhejiang University and a joint PI of the Neurosurgery Department of the Second Affiliated Hospital of Zhejiang University. He was graduated from Tsinghua University with a doctor's degree in 2008. He has been a Postdoctoral Researcher at the University of Oregon from 2008.02 to 2012.12, and research scientist at University of Virginia School of Medicine from 2013.01 to 2015.03. He has been a researcher of School of Basic Medicine, Zhejiang University from 2015.04 to 2020.10, and a researcher at the School of Brain Science and Brain Medicine, Zhejiang University since 2020.11. Dr. Liu is interested in the development of genetic models of diseases, mechanisms of neurogenesis and the interaction between tumors and the microenvironment. The laboratory mainly uses the advantages of multi-disciplines, combined with developmental biology, neurobiology, single-cell sequencing technology, in vivo two-photon imaging and chemical genetics to analyze the biological basis of glioma cell of origin and carcinogenesis from multiple levels, and screen specific diagnostic markers and key therapeutic targets. Related research work has been published in ***Nature***, ***Cell***, ***Advanced Science***, ***Neuro-oncology*** and other journals.

Topic A Novel Genetic Disease Models to Dissect the Molecular Mechanism and to Visualize the Initiation and Progression of Glioma

Cancer initiation and progression are always associated with the acquisition and accumulation of genetic mutations which drive the malignant transformation of the cancer cells of origin. It has been shown that different driver mutations can generate tumors with distinct pathological features. How driver mutations interact with tumor cells of origin and how such interactions dictate the fate of the cell of origin and the tumor pathological features are the fundamental questions in cancer biology. Here we developed a set of novel “all-in-one” glioma lineage-tracing model system based the intra-brain ventricle electroporation and transposon-mediated conditional gene editing techniques. By using this system in genetically engineered mouse models, we generated glioma models with the top driver mutation combinations found in GBM patients, therefore almost recapitulating the full driver-mutation spectrum found in glioblastoma patients. The results will help to address those fundamental questions pertinent to the relationships between driver mutations, tumor evolution pathways and the final tumor phenotypes. The results will also help to understand the nature of gliomagenesis and to develop novel approaches for glioma intervention and treatment.

Dr. Cong Liu

Principal Investigator

Interdisciplinary Research Center on Biology and Chemistry, CAS

Dr. Liu is currently a principal investigator at Interdisciplinary Research Center on Biology and Chemistry (IRCBC), SIOC, CAS. He received his PhD in Biochemistry at Peking University, and then joined Prof. Eisenberg's lab as a postdoctoral fellow in the department of Chemistry and Biochemistry, UCLA. Dr. Liu mainly focuses on investigating the molecular basis of protein pathological aggregation and phase separation in Parkinson's disease by using interdisciplinary approaches. As the (co)-corresponding, Dr. Liu published 40 papers, including ***Cell***, ***PNAS*** (7), ***NSMB*** (3), ***Cell Research*** (5), ***Nat Commun*** (7), ***Mol Cell***, ***Dev Cell***, and ***Sci Adv***. His systematical findings on protein phase separation and aggregation in neurodegenerative diseases have been well recognized internationally in the field, and he has been invited by Nat Rev Neurosci and Nat Chem Biol to write reviewing articles for introducing the structural polymorphism of amyloid aggregation and its hierarchical chemical determination in NDs.

Topic Mechanistic View of A-synuclein Pathological Aggregation in Parkinson's Disease

Many neurodegenerative diseases are associated with intracellular protein aggregates, such as tau in Alzheimer's disease, and α-syn in Parkinson's disease. We found that pathological amyloid aggregates exhibit highly polymorphic fibrillar structures with distinct pathologies, which renovates the traditional view of protein pathological aggregation as misfolded amorphous aggregates. Moreover, our works show amyloid aggregation is under dynamic and hierarchical regulation by different chemical modifications including glycosylation and phosphorylation, providing understanding on how different pathological amyloid polymorphs are determined under different diseased conditions.

Dr. Ben Lu

VP, Xiangya Medical College
Third Xiangya Hospital of
Central South University

EDUCATION

Ph.D Clinical medicine, Xiangya Hospital of Central South University 2007-2010
M.D. Internal Medicine, Xiangya School of Medicine, 2001-2007

ACADEMIC EXPERIENCE

Professor and doctoral tutor, Physician of Department of Hematology, the 3rd xiangya hospital of the Central South University

SOCIAL ACTIVITIES

Assistant Professor at the Feinstein Institute for Medical Research and Hofstra School of Medicine. Chief Scientist of a National 973 Science Project

RESEARCH AREA

The pathogenesis of sepsis and the molecular mechanisms of inflammation

RESEARCH PROJECTS

Received several prestigious grants from Chinese government, including the “One thousand people plan” project, “Excellent Young Investigator Science Fund” and a “Natural Science fund” from the Natural Science Foundation of China.

Topic Programmed Cell Death and Critical Illness

Programmed cell death (PCD) is essential for numerous biological processes, such as the development of organs, lymphocyte selection, and host defense against invasive microbes. Accumulated evidence reveal that excessive PCD importantly contributes to the pathogenesis of critical illness, including sepsis, heatstroke, severe viral infection, and cytokine shock syndrome. These life-threatening conditions characterized by multiple organ injuries are the major cause of death in hospital. This review focuses on the roles of PCD in different types of critical illness and the mechanisms by which PCD contributes to the pathogenesis of critical illness. We will also discuss the therapeutic potential of PCD targeting molecules for the treatment of sepsis, an infection-induced critical illness that accounts for more than 11 million deaths ever year in the world.

Dr. Boxun Lu is currently a professor at Fudan University, China. He has been working on Huntington's disease and other neurodegenerative disorders with a focus on degrading the pathogenic proteins for potential therapeutic treatment for these diseases. He proposed the original concept of ATTEC and worked with key collaborators to lead the studies of ATTECs targeting polyQ proteins and lipid droplets. The team is currently expanding the target spectrum of ATTECs and inventing novel protein/organelle manipulating strategies. The team is also investigating novel pathogenic mechanisms and therapeutic targets of neurodegenerative disorders.

Dr. Boxun Lu

Professor

School of Life Sciences
Fudan University

Topic The Gelation of Cytoplasmic CAG Repeat Expansion RNAs Suppresses Global Protein Translation

RNA molecules with the expanded CAG repeat (eCAGr) may undergo sol-gel phase transitions in vitro, but the cellular presence and functional impact of RNA gelation is unclear. Here, we demonstrate that eCAGr RNA may form cytoplasmic gel-like foci that were rapidly degraded by lysosomes in a LAMP2C-dependent manner. These RNA foci may cause a significant reduction of the global protein synthesis rate in cells and in vitro, possibly by sequestering the protein translation elongation factor eEF2. Disrupting the eCAGr RNA gelation restored the global protein synthesis rate, whereas enhanced gelation induced by an optogenetic system exacerbated this phenotype. eEF2 puncta were significantly enhanced in brain slices from a knockin mouse model and patients of Huntington's disease, which is a CAG expansion disorder expressing the eCAGr RNA. Finally, neuronal expression of the eCAGr RNA by AAV injection caused significant behavioral deficits and electrophysiological changes in vivo in the mouse model. Our study demonstrates the existence of RNA gelation inside the cells and reveals its functional impact, providing new mechanistic insights into repeat expansion diseases and global protein synthesis regulation.

Dr. Wei Mo

Professor

Xiamen University

Hangzhou is my hometown. I left Hangzhou for Shanghai after graduation from Zhejiang University in 2002. I went to Dallas for my postdoc training in 2009 when I got my Ph.D in SIBCB. In 2014, I established my own lab in Xiamen University. My lab is interested in cell death and inflammation with particular enthusiasm on the celluar stress responses to the activation of endogenous retrovirus under various physiological or pathological condition.

Topic Endogenous Retrovirus in Stem Cells

Endogenous Retrovirus (ERVs) belong to the transposable elements (TEs) which are epigenetically silenced in majority of cells. The reactivation of ERVs in stem cells is inflammatory. We show that the transcriptional activation of ERVs in intestinal stem cells (ISCs) leads to bowel inflammation. The dsRNA generated from ERVs binds to Z-form nucleic acids (ZNAs) sensor ZBP1 which in turn recruits RIP3 for necroptosis in ISCs. In contrast, the neuroinflammation caused by reactivation of ERVs in neural stem cells (NSCs) is independent of ZBP1 nor cell death. Neuron differentiated from those NSCs expresses higher level of Complement C4b which provokes the microglia for synaptic loss. Prenatal immune stress induces the activation of ERVs in NSCs and leads to autism. These results indicate the inflammation arisen from ERVs could be the important pathogenic factor of some intractable diseases.

Dr. Qi is a Professor in Immunology at Tsinghua University. He studies humoral immune regulation and germinal center biology. His group has made important contributions to our understanding of molecular mechanisms underlying T-B interactions, follicular helper T-cell development and function, and germinal center positive selection. His group has also made important advances in mechanistic understanding of sexual dimorphism in B-cell immunity and how brain can directly control antibody responses. Dr. Qi is an HHMI International Scholar and has been recognized by numerous awards, including an AAI-BD Investigator Award.

Dr. Hai Qi

Dean

School of Medicine

Tsinghua University

Topic Germinal Ccenters and Long-lived Humoral Immunity

The germinal center (GC) reaction gives rise to affinity-matured, long-lived plasma cells and memory B cells. How affinity-based positive selection is orchestrated and how selected cells are destined for memory or plasma cell development are not fully understood. I will present our recent published and unpublished work that shed lights on these important questions in humoral immune regulation.

Dr. EnZhi Shen

Principal Investigator

School of Life Sciences
Westlake University

After postdoctoral training with Dr. Craig C. Mello in the RNA Therapeutics Institute at Umass Medical School, I joined Westlake University as an Assistant Professor in October 2019. Small noncoding RNAs (snRNAs) play notable roles in regulating gene expression associated with cellular development, differentiation, and growth. In all organisms, snRNAs, including PIWI-interacting RNA (piRNA) and small interfering RNA (siRNA), bind to Argonaute family proteins and direct them to recognize and mediate complementary targets. Using Caenorhabditis elegans as a model system, our recent study identified transcriptome-wide piRNA-target site interactions and uncovered the piRNA targeting rule, suggesting that using this targeting rule, more than thousands of piRNAs function as a surveillance system to detect foreign nucleic acids, such as transposons, therefore maintaining the genome integrity. By combining complementary approaches including genetics, informatics, biochemistry, and biophysics, our research program aims to identify important principles of snRNA regulatory molecular mechanisms and uncover novel biological functions of snRNAs that are likely conserved between different animals. This research will not only deepen our understanding of snRNA' s remarkable functions, but may ultimately lead to the development of snRNA-based tools and better strategies for disease treatment in animals and plants.

Topic PIWI-interacting RNA (piRNA) and Gene Regulation

The PIWI-clade argonaute-interaction RNA (piRNA) pathway is a nucleic acid-mediated innate immune system that rapidly evolved to suppress pathogenic transposons. Piwi protein is the central component of the piRNA pathway, using piRNA to recognize and silence these transposed elements to maintain the stability and integrity of the germ cell genome. We reveal the molecular mechanisms of piRNA regulation by combining genetics, informatics, biochemistry, and biophysics.

Xiaohua is a Professor and a Cheung Kong Scholar in the School of Medicine at Tsinghua University. Her major research is to understand how the non-coding portions of the genome influence chromatin structure, gene expression, and stem-cell fate in development. In the past years, the Shen lab has rigorously investigated fundamental aspects of ncRNAs, genomic repeats, and RNA-binding proteins in the regulation of transcription and chromatin. Her work facilitates the functional inference of ncRNA genes, and brings about a paradigm-shifted understanding of genomic repeats and their associated transcripts in organizing the genome and the higher-order chromatin structure.

Dr. Xiaohua Shen

Professor

School of Medicine
Tsinghua University

Topic The Noncoding Genomes in Transcription and Chromatin Organization

Much of the developmental complexity and biodiversity of higher eukaryotes is thought to arise from gene regulation. RNA represents a hidden layer of regulatory information in complex organisms. I will discuss our recent progress in exploring fundamental aspects of genomic repeats, noncoding RNA, and RNA-binding protein in the regulation of transcription and genome organization.

Dr. Jiaying Tan

Head of Strategy & Partnership in Greater China / Snr. Scientific Editor

Cell Press / *Cell*

Dr. Jiaying Tan is the Head of Strategy and Partnership in Greater China at Cell Press, and a Senior Scientific Editor at ***Cell***. She earned her PhD in Molecular and Cellular Pathology in the University of Michigan-Ann Arbor in 2012, before moving to the Novartis Institutes for BioMedical Research in Shanghai to conduct postdoctoral research in cancer biology. She joined the ***Cell*** editorial team in 2013. During the past few years, in addition to her editorial work at ***Cell***, she has also served as a consulting editor at ***Cell Reports***, the acting Editor-in-Chief of ***The Lancet Haematology*** from July 2018 to January 2019, and the co-acting Editor-in-Chief of ***Cancer Cell*** from October 2019 to February 2020.

Topic Publishing at *Cell*

Cell publishes findings of unusual significance in any area of experimental biology, including but not limited to cell biology, molecular biology, neuroscience, immunology, virology and microbiology, cancer, human genetics, systems biology, signaling, and disease mechanisms and therapeutics. The basic criterion for considering papers is whether the results provide significant conceptual advances into, or raise provocative questions and hypotheses regarding, an interesting and important biological question. In addition to primary research articles in four formats, ***Cell*** features review and opinion articles on recent research advances and issues of interest to its broad readership in the leading edge section.

Hosted by Dr. Dangsheng Li, Editor-in-Chief of ***Cell Research*** and a professor of Center for Excellence in Molecular Cell Science, CAS.

I received my medical training at Shanghai Jiao Tong University School of Medicine, where I also earned a PhD degree in 2010, studying the role of reactive oxygen species during tumor development. From 2008 to 2011, I continued my research in University of California, Los Angeles (UCLA), first as an exchange PhD student and then a post-doctoral fellow, studying transcriptional regulation of eye-specific genes by CTCF-mediated chromatin organization. I began my editorial career as a Scientific Editor at ***Cell Research*** in 2012 and joined ***Nature Cell Biology*** in 2017. I moved to ***Nature*** in June 2022 and currently handle papers related to epigenetics, chromatin, transcription and signal transduction.

Dr. Jie Wang
Senior Editor
Nature

Topic Science Publishing - Behind the Scenes at *Nature*

N*ature* is a weekly international journal publishing the finest peer-reviewed research in all fields of science and technology on the basis of its originality, importance, interdisciplinary interest, timeliness, accessibility, elegance and surprising conclusions. ***Nature*** also provides rapid, authoritative, insightful and arresting news and interpretation of topical and coming trends affecting science, scientists and the wider public. In this talk, I will give a brief introduction of ***Nature*** and ***Nature*** family journals, with a focus on the editorial process, editor' s roles and responsibilities, and editorial threshold for biological submissions.

Hosted by Dr. Dangsheng Li, Editor-in-Chief of ***Cell Research*** and a professor of Center for Excellence in Molecular Cell Science, CAS.

2005.09 - 2009.06: B.S., School of Life Science, Sichuan University

2009.09 - 2014.06: Ph.D., Institute of Biophysics, Chinese Academy of Sciences

2014.07 - 2014.10: Associate professor, Institute of Biophysics, Chinese Academy of Sciences

2014.07 - 2016.03: Academic visitor, University of Oxford

2014.11 —— : Professor, Institute of Biophysics, China

Dr. Xiangxi Wang

Principal Investigator

Chinese Academy of Sciences

Topic Viral Structure, B Cell Repertoire and Vaccine Design

Vaccines mainly induce humoral and cellular immune responses through immunogens and adjuvants to produce neutralizing antibodies and other protective substances. When the body comes into contact with this pathogen again, it quickly starts the immune system to neutralize and kill the pathogen. Traditional vaccines include live-attenuated vaccine, inactivated vaccine, vector vaccine and subunit vaccine etc., and they can effectively protect a variety of infectious diseases. However, the vaccines can do nothing with some infectious diseases, such as AIDS, dengue fever, respiratory syncytial virus pneumonia, ASFV and herpes. Vaccines that adopting new technologies, such as mRNA vaccine and nanoparticle candidate vaccine, have shown the advantages of short R&D cycle, rapidness, efficient induction, long-term protection and personalized upgrade, and thus have a bright future. The core of new vaccine R&D lies in the design concept on the basis of certain basic research, and new vaccines are expected to have immunogens with stable and correct conformation in vivo or in vitro and induce sufficient neutralizing antibodies. The best immunity is that a variety of different types of neutralizing antibodies (diversity of neutralizing antibodies) are produced to target at different epitopes to exert high-efficiency inhibitory effects by using different neutralization mechanisms, as well as resist the risks of vaccine failure caused by mutations of the virus at some points. However, un-designed immunogens can only induce partial neutralizing antibodies. Especially, the proportion of memory antibodies is much lower. The identified epitope, neutralization titer, neutralization mechanism, memory association, maternal generation mechanism and other scientific problems of a variety of neutralizing antibodies are systematically researched.

2012-present Professor, Beijing Normal University, Dr. Xiaoqun Wang is interested in the function and regulation of neural stem cells in mammalian brains. More specifically we are working on 1) Neural stem cell subtypes; 2) Niches and neural differentiation of neural stem cells; 3) Modeling human brain developmental diseases with pluripotent stem cells and in animal models; 4)Cellular mechanism regulating neural stem cell fate and circuits formation during the development of cerebral cortex; 5)Molecular regulations of nervous system diseases, including lisencephaly, microcephaly, autism, depression, and neurodegenerative diseases.

Dr. Xiaoqun Wang

Professor/ Principal Investigator/ Director

Beijing Normal University

Topic Human Neural Progenitor Diversity during Cortical Development

Suijuan Zhong, Xin Zhou, Bo Zeng, Mengdi Wang, Qian Wu and Xiaoqun Wang State Key Laboratory of Cognitive Neuroscience and Learning, IDG/McGovern Institute for Brain Research, Beijing Normal University, Beijing, 100875, China.

The human brain contains billions of neurons that were originally generated from neuroepithelial cells. The cerebral cortex can be divided into the following lobes: the frontal lobe (FL), parietal lobe (PL), occipital lobe (OL) and temporal lobe (TL), with each showing specialized functions in sensory and motor control and having specific projections to different targets of the nervous system. Our previous study revealed the developmental process of the human prefrontal cortex, which is the most uniquely expanded region of the human nervous system. However, spatial and temporal regulation of different brain region at single-cell resolution at a serial of embryonic time points has not yet been performed systemically. Radial glia (RG) are primary neural stem cells of the cortex, and are developed by recent investigations into the spatiotemporal, transcriptomic, and morphological diversity of human RG. To explore cell-type diversity and heterogeneity, we identified 21molecularly distinctive subtypes for RG. It is important to explore the diversity and spatial location of RG cells and the distinctive differentiation paths to various neuron types during early embryogenesis. We not only transcriptionally and spatially resolved 21 RG subtypes but also identified the distinctive regionalization-specific RG-IPC/TransPro-neuron differentiation trajectories, providing a powerful tool for understanding the molecular mechanisms of orchestra neurodevelopment. This study also verified the precise time of oRG cell occurrence, as well as the relevant signaling pathways regulating the oRG generation.

Dr. Yanli Wang

Principal Investigator

Institute of Biophysics, CAS

Yanli Wang is a professor in Institute of Biophysics, Chinese Academy of Sciences, and a HHMI International Research Scholar. Prof. Wang has completed her PhD from University of Science and Technology of China and postdoctoral studies from Memorial Sloan-Kettering Cancer Center. Prof. Wang's group interests in understanding how small regulatory RNA or DNA mediates prokaryotic defense against invasion by foreign nucleic acids. The main focus of her work is to systematically demonstrate the mechanisms of the CRISPR-Cas system, and Ago protein-mediated DNA interference.

Topic How Does CRISPR-Cas9 Cut DNA and Be Inhibited by Acrs?

CRISPR-Cas systems are adaptive immune systems of bacteria and archaea that defend against bacteriophages. To evade the threat of CRISPR-Cas systems, some bacteriophages encode anti-CRISPR (Acr) proteins. We are interested in the molecular mechanism of high-fidelity II-C Cas9 enzymes and how the Acr protein inhibits its activity.

Dr. Xiaoliang Xie

Professor
Peking University

Xiaoliang Sunney Xie is the Lee Shau-kee Professor and Dean of Faculty of Sciences at Peking University. He received his B.Sc. in Chemistry from Peking University in 1984, and Ph.D. in Physical Chemistry from University of California at San Diego in 1990. He became the first tenured professor in 1998 and the first endowed Professor in 2009 at Harvard University among Chinese scholars since China's reform and opening up. He relocated to Peking University in 2018.

Xie has been a pioneer of single-molecule biophysical chemistry, coherent Raman scattering microscopy and single-cell genomics. The single-cell whole genome amplification methods that his group invented has to date benefited thousands of families with monogenic diseases by successfully preventing the passing of disease-causing mutations to their offspring. In fighting against the COVID-19 pandemic, Xie's team has identified broad-spectrum neutralizing antibodies against all SARS-CoV-2 variants, which have been licensed to Sinovac.

Xie received numerous international awards, most notably Albany Prize in Medicine and Biomedical Research, Peter Debye Award in Physical Chemistry of American Chemical Society and Founders Award of Biophysical Society.

Topic Single-cell Genomics: Coming of Age for Biology and Medicine

TBD

Dr. Xiufang Xin

Principal Investigator

Center for Excellence in Molecular Plant Sciences/ Institute of Plant Physiology and Ecology, CAS

I got my bachelor's degree in biology at China Agricultural University in 2008 and then went to Michigan State University for Ph.D. study. After getting my doctoral degree in 2014, I stayed at Michigan State University for 3 years of postdoc and joined Chinese Academy of Sciences (CAS), Shanghai, to start my own group in 2017. My lab is also affiliated to the joint program of CAS-John Innes Centre, Centre of Excellence for Plant and Microbial Sciences (CEPAMS). My group are interested in understanding the molecular interplay between plant immunity and pathogen virulence strategies as well as phyllosphere microbiota.

Topic Understanding Plant-pathogen Interactions in the Phyllosphere

Plants are sessile and, to survive the constant challenges from infectious microbes in the living environment, evolved the innate immune system to recognize pathogens and activate defense. I will talk about the current understanding of plant innate immune system, particularly the recent discovery of the intimate crosstalk between the two primary pathogen-recognizing pathways, pattern triggered immunity and effector triggered immunity, in plants, and how environmental factors (e.g., temperature, air humidity) could interfere with plant immunity and promote diseases.

Chenqi Xu started his independent career at the end of 2009 and his laboratory has made original discoveries in T *cell* biology, including illustrating the electrostatic regulation model of immunoreceptor signaling and the critical function of cholesterol in antitumor immunity. He also develops new strategies of cancer immunotherapy, which have been successfully licensed out to biotech companies. His representative publications include *Cell* 2020, Nature 2018, Nature 2016 and Nature 2013. Two of his works were selected as "Top 10 Science Breakthroughs of China of Year 2016" and "Top 10 Life Science Breakthroughs of China of Year 2016 and Year 2020". He now serves as an editorial board member of *Cell Research*, *Life Metabolism* and *JBC*.

Dr. Chenqi Xu

Professor

Shanghai Institute of Biochemistry and *Cell Biology*, CAS

Topic Enhancing CD3 Diversity to Improve CAR-T Cell Persistence

Clinical success of CAR-T cell therapy in cancer treatment demonstrates the tremendous potential of cell medicine and reveals the arrival of a new era of drug development. However, major clinical challenges including high relapse rate and adverse effect remain to be resolved. Compared with the native antigen receptor TCR, synthetic CAR constructs show poor antigen sensitivity and hardly induce persistent T-cell responses. TCR contains four CD3 signaling chains while CAR only utilizes one of them. CD3e is a multi-functional protein that can regulate TCR signaling, clustering and surface expression. Incorporation of CD3e into CAR constructs promotes long-term killing through amelioration of cell exhaustion and meanwhile reduces cytokine production. These benefits depend on the unique CD3e ITAM that can be mono-phosphorylated to recruit an inhibitory molecule Csk. Enhancing CD3 diversity thus represents a promising direction to improve clinical performance of CAR-T cell therapy.

Dr. Meng Xu

Professor

Tsinghua University

2017: Principal investigator, School of Medicine, Tsinghua University, Beijing, China

2016-2017: Research Assistant Professor, University of Chicago, Chicago, IL, USA

2013-2016: Postdoctoral Scholar, Department of Pathology, University of Chicago, Chicago, IL, USA

2007-2012: PhD in Cell Biology, Institute of Biophysics, Chinese Academy of Science, Beijing, China

2003-2007: Bachelor of Pharmacology, Capital Medical University, Beijing, China

Topic Targeting RNA Modification Machinery as New Therapeutic Modalities for Cancer

Characterization of RNA modifications has identified their distribution features and molecular functions. Dynamic changes in RNA modification on various forms of RNA are essential for the development and function of the immune system. We discuss the value of innovative RNA modification profiling technologies to uncover the function of these diverse, dynamic RNA modifications in various immune cells within tumor contexts. Further, we explore our current understanding of the mechanisms whereby aberrant RNA modifications modulate the immune milieu of the tumor microenvironment and highlight the potential of targeting RNA modification machinery as new therapeutic modalities.

Rui-Ming Xu received his Ph.D. degree in Physics from Brandeis University in 1990. Following post-doctoral training in physics with Steven Weinberg at UT Austin and C.N. Yang at SUNY Stony Brook, he changed his field of research to structural biology in 1993 at Cold Spring Harbor Laboratory, where he rose to the rank of Professor. He joined NYU School of Medicine as a tenured professor in 2005, and in 2008 have moved to Institute of Biophysics, Chinese Academy of Sciences, where he is currently Director and an Investigator. His research interest has been on molecular mechanisms of eukaryotic gene repression, with particular emphasis on epigenetic inheritance and RNA processing.

Dr. RuiMing Xu

Director & Investigator

Institute of Biophysics, CAS

Topic Mechanism of De Novo Nucleosome Assembly

Chromatin inheritance following DNA replication entails de novo nucleosome assembly by chromatin assembly factor-1 (CAF-1), which is a conserved heterotrimeric complex responsible for histone deposition at the replication fork during S-phase. We have determined the structure of CAF-1 bound to histones H3 and H4, and revealed significant insights into the process of nucleosome assembly by CAF-1.

Dr. Xiaohong Xu

Principal Investigator

Insititute of Neuroscience, CAS

Dr. Xu Xiaohong got her bachelor degree in 2000 from Peking University, and received her Ph.D degree from Case Western Reserve University in 2006. From 2006 to 2012, she was a postdoctoral fellow in Dr. Nirao Shah's lab at California University. She joined ION in November 2012 as a Principal Investigator and the Head of the Laboratory of Instinctive Behaviour.

Topic A Hippocampal-hypothalamic Circuit Essential for Anxiety-related Behavioral Avoidance

Behavioral observations suggest a connection between anxiety and predator defense, but the underlying neural mechanisms remain unclear. Here we examine the role of the anterior hypothalamic nucleus (AHN), a node in the predator defense network, in anxiety-like behaviors. We find that convergent activation of AHNVgat+ neurons serves as a shared mechanism between anxiety and predator defense to promote behavioral avoidance.

Assistant principal, USTC
Director of CAS key laboratory of brain function and disease
Head of Division of Neural Circuits and Cognition,Hefei National Research Center for Physical Sciences at the Microscale
Director of Human resources,USTC

Education and Appointment:
2012.09-Present: Professor,USTC
2011.06-2012.08: Research Associate,Johns Hopkins University School of Medicine
2006.03-2011.05: Postdoctoral Fellow (with Dr. King-Wai YAU),Johns Hopkins University School of Medicine, Neuroscience
2000.09-2005.05: Ph.D. Johns Hopkins University School of Medicine, Cellular Molecular Physiology
1995.09-2000.06: B.S. USTC, Biophysics and Neuroscience; Special Class for Gifted Young (SCGY)

Dr. Tian Xue

Professor
Division of Life Sciences and Medicine
University of Science & Technology of China

Topic Light and Life – Not Just for Seeing

Light sensation not only provides us with the image vision perceptions, but also regulates many physiological functions, such as circadian rhythm, pupillary reflex, arousal, mood, development and metabolic homeostasis. But the photoreceptors, neural circuits, molecular and cellular mechanisms of these light regulated life processes are still large unknown. Recently, our laboratory discovered the neurophysiological mechanisms of light-at-night induced depression; cortical synaptogenesis promoted by light sensation during infanthood; and even light regulated glucose metabolism. These works revealed that the interaction between "light and life" is much more extensive and complicated than we generally understood.

Dr. Nieng Yan

Principal Investigator

Shenzhen Medical Academy of Research and Translation (SMART)
School of Life Sciences
Tsinghua University

Dr. Nieng Yan received her B.S. degree from the Department of Biological Sciences & Biotechnology, Tsinghua University, Beijing, China, in 2000. She then pursued her PhD in the Department of Molecular Biology at Princeton University under the supervision of Prof. Yigong Shi between 2000 and 2004. She was the regional winner of the Young Scientist Award (North America) co-sponsored by Science/AAAS and GE Healthcare in 2005 for her thesis on the structural and mechanistic study of programmed cell death. She continued her postdoctoral training at Princeton University, focusing on the structural characterization of intramembrane proteases. In 2007, she joined the faculty of School of Medicine, Tsinghua University. Her lab has been mainly focusing on the structural and functional study of membrane transport proteins exemplified by the glucose transporters and Na+/Ca2+ channels. In 2012 and 2013, she was promoted to tenured professor and Bayer Endowed Chair Professor, respectively. Dr. Yan was an HHMI international early career scientist in 2012-2017, the recipient of the 2015 Protein Society Young Investigator Award and the 2015 Beverley & Raymond Sackler International Prize in Biophysics, and the Alexander M. Cruickshank lecturer at the GRC on membrane transport proteins in 2016.transporters and Na+/Ca2+ channels. In 2012 and 2013, she was promoted to tenured professor and Bayer Endowed Chair Professor, respectively. Dr. Yan was an HHMI international early career scientist in 2012-2017, the recipient of the 2015 Protein Society Young Investigator Award and the 2015 Beverley & Raymond Sackler International Prize in Biophysics, and the Alexander M. Cruickshank lecturer at the GRC on membrane transport proteins in 2016.

Topic Targeting Na_V Channels for Pain Relief

Voltage-gated sodium (Na_V) channels are responsible for the initiation and propagation of action potentials. Associated with a variety of disorders, Na_V channels are targeted by multiple pharmaceutical drugs and natural toxins. Employing the modern methods of cryo-EM, we determined high resolution structures of a number of eukaryotic and eventually human Na_V channels in complex with auxiliary subunits, toxins, and drugs, which reveal the mode of action of representative Na_V modulators. Based on the structural discovery, we suggest a "door-wedge" allosteric blocking mechanism for fast inactivation of Na_V channels. Structural comparison of the conformationally distinct Na_V channels provides important insights into the electromechanical coupling mechanism of Na_V channels, offers the 3D template to map hundredes of disease mutations, and will aid rational design of next-generation pain killers.

Dr. Ling-juan Zhang

Professor

School of Pharmaceutical Science, Xiamen University

Dr. Ling-juan Zhang is a full professor at the state key lab of cellular stress biology, school of Pharmaceutical Science, Xiamen University. She received her Ph.D. in Pharmacology at Oregon State University and post-graduate training at the Department of Dermatology at the University of California, San Diego, where she continued as a Project Scientist and directed an NIH RO1 project before coming back to China. Dr. Zhang's research focuses on the innate immune mechanisms of skin host defense against bacterial infection as well as pathogenesis inflammatory skin diseases such as psoriasis. Her ground-breaking research discovered the innate immune antimicrobial function of dermal fat and her research findings have been in prestigious journals including *Science* (2015), *Immunity* (2016 and 2019), and *Science Translational Medicine* (2021) with more than 2600 citations. Dr. Zhang has received several Chinese National and Fujian Province Young talent awards, and she has also been elected as a board member of prestigious societies including Chinese society of Skin Immunology, Chinese society of Investigative Dermatology and Society of Chinese Medicine Immunology Branch.

Topic Discovering the Innate Immune Antimicrobial Function of Dermal Fat

Dermal white adipose tissue (dWAT) is a unique layer consisting of adipocytes and their highly heterogeneous progenitors within the skin dermis. We have found that dWAT plays a critical role in skin defense against invasive Staphylococcus aureus infection by producing antimicrobial peptides, a process termed as "dermal reactive adipogenesis" . And an age- and/or diet- dependent activation of the TGFβ-TGFBR-SMAD2/3 pathway abolished dermal reactive adipogenesis, leading to increased infection risk in aged and/or obese mice. Together, our findings have unraveled the previously unrecognized innate immune functions and regulatory mechanism of dWAT.

Dr. Ting Zhou

Principal Investigator
School of Life Sciences
Westlake University

Dr. Zhou received his Bachelor's degree from China Agricultural University in 2006, and Ph.D. degree from Institute of Biophysics, Chinese Academy of Sciences in 2014. Then he went to do his first postdoctoral training at Yale University, Department of Molecular, Cellular and Developmental Biology, studying HCV NS3 helicase kinetics. In 2016, he switched to Yale Immunobiology Department, focusing on exploring cytokine biology in tumor immunity and engineering cytokine for cancer immunotherapy. Dr. Zhou joined Westlake University in 2021 as an assistant professor and principal investigator.

Topic Synthetically Tuning IL-18 Pathway for Cancer Immunotherapy

Cytokine immunotherapy has been a pioneer in demonstrating durable anti-tumor efficacy in patients but was dampened by its pleiotropism and negative feedback. In this work, we identified the decoy receptor of IL-18, IL-18BP, is highly elevated in tumor microenvironment and served as a soluble immune checkpoint and barrier to effective IL-18 immunotherapy. We continued to engineer decoy-resistant IL-18 (DR-18), which maintains receptor signaling ability but bypasses the inhibition of IL-18BP. DR-18 elicits strong anti-tumor efficacy through augmenting effector T cell function and expanding TCF1+ memory precursor CD8+ T cell pool. Our study therefore established the basis of combing synthetic protein engineering with immuno-pharmacology to investigate complex cytokine regulatory pathway and pave the way for the clinic translation.

Dr. Bing Zhu

Investigator

Institute of Biophysics, CAS

Bing Zhu, Ph.D., is investigator and deputy director of the Institute of Biophysics, Chinese Academy of Sciences. Dr. Zhu received his Ph.D. in molecular genetics from the Shanghai Institute of Plant Physiology, Chinese Academy of Sciences in 1999. Following his postdoctoral studies on DNA demethylation and co-transcriptional chromatin modifications at the Friedrich Miescher Institute, Switzerland, and at the Howard Hughes Medical Institute, he joined the National Institute of Biological Sciences, Beijing, as a faculty. He joined the Institute of Biophysics, Chinese Academy of Sciences as an investigator in 2014. He greatly contributed in revealing mechanisms governing mitotic inheritance of chromatin modifications. He clarified the nucleosome partition pattern during DNA replication. He discovered the first chromatin modifying enzyme that senses nucleosome density. More recently, he advanced our knowledge in mechanisms regulating the de novo establishment of DNA methylation, DNA methylation maintenance, signal induced selective demethylation and its role in transcriptional memory. Dr. Zhu is an internationally recognized scientist, who was awarded as an International Early Career Scientist Howard Hughes Medical Institute. Starting from 2020, Dr. Zhu serves as a member of the Board of Reviewing Editors of the *Science* magazine.

Topic Epigenetics: Remember the Past & Prepare for the Future

The epigenetic system helps to fulfil two basic challenges of multicellular organisms: proliferation and differentiation. Epigenetic plasticity allows cells to differentiate, whereas epigenetic inheritance and maintenance help to maintain cell fate in proliferating cells and postmitotic cells. Interestingly, epigenetic mechanism not only regulate gene expression at the current stage, but also regulates gene induction kinetics in the future, via different mechanisms in different biological processes. In this talk, I will highlight our recent discoveries regarding how epigenetic mechanisms regulate the kinetics of future gene induction in biological processes such as memory and reining.

VENUE

Westlake University (Yungu Campus)

Established in 2018, Westlake University is a new type of research university, a first in the history of modern China. We enjoy strong public support and aim to be a reformer in our higher education system. Founded by prominent scientists and scholars, Westlake University is committed to building a truly international, world leading, research-focused university.

Yungu Campus adopts a layout of "concentric circles" where the academic and research loop is surrounded by a loop of residential and sporting facilities. The natural academic and residential loops are all organically integrated by a circular water system and 12 bridges. The Academic Ring is the heart of Westlake University and comprises a circular research platform and four connected major buildings. The buildings are connected by a C-shaped corridor and each building houses a School. The design of the Academic Ring reflects Westlake University's philosophy of academic freedom and interdisciplinary interaction: the four buildings represent independent research whereas the circular shape represents interdisciplinary study. As the center for the exchange of thoughts, the C-shaped corridor provides plenty of spaces for discussion between faculty members and students. It is an ideal place for everybody to read, study, discuss, and relax. With the aroma of coffee and the sights of nature all around, it is here that the world's greatest minds will get inspiration, do research and collaborate.

Yungu is the perfect place for our campus. Its welcoming, warm, textured and bright nature makes it the right location to deliver our promise and build a comfortable home without sacrificing comfort or convenience.

Xixi National Wetland Park

Around 9 kilometres away, the city's largest natural wetland park is a great place to lay back and enjoy nature's beauty.

West Lake

Around 20 kilometres away, West Lake scenic area offers the modern vibe of a bustling city center perfectly woven into the traditional elegance and picturesque beauty of one of the most beautiful sights in China.

GENERAL INFORMATION

1 Meeting Arrangement

- Accommodation: Yungu Campus Conference Center (Wassim Hotel Hangzhou)
- Meeting Venue: 1F, Jiang-Nan Hall, Wassim Hotel

2 Contact

- Kaina Li: 185 0681 6876
- Han Dai: 151 5889 2156

3 Weather Information

- The average daytime temperature is expected to be 11°C and the average nighttime temperature is expected to be -1°C during the conference. Warm reminder: The night temperature is low, please bring warm clothes.

4 Emergency Contact

- 119 - Fire
- 120 - Ambulance
- 110 - Police

5 Precautions

- Please read the conference handbook and arrange your time according to the agenda.
- If you leave the hotel for activities, please travel in groups and stay safe.
- In case of physical discomfort or special circumstances, please contact the conference staff.

6 Epidemic Prevention and Control

- All attendees are requested to strictly observe the epidemic prevention and control regulations of the hotel and governing entities. Please wear masks, practice good hand hygiene, and keep a reasonable social distance.

CHINESE BIOLOGICAL INVESTIGATORS SOCIETY

School of Life Sciences
Official WeChat Account

School of Life Sciences
Official WeChat Channel

CBIS 2022
Official Hangzhou Website