

FRONTIERS IN LIFE SCIENCE 2016

Palace Garden Hotel and Resorts,
Beijing, September 26



Monday, September 26, 2016

Morning Session (Han Dynasty Hall, 1st Floor)

Presentations (40-minute talk and 5-minute Q&A)

- 08:30 – 08:40 Welcome and introduction by Dr. **Xiaodong Wang**, Director and Investigator, National Institute of Biological Sciences, Beijing (NIBS)
- 08:40 – 09:15 Dr. **Phillip Sharp**, Professor, Massachusetts Institute of Technology (MIT), the 1993 Nobel Laureate
Title: **Divergent transcription, non-coding RNA and phase-transitions**
- 09:15 – 09:50 Dr. **Feng Shao**, Investigator and Deputy Director for Academic Affairs, National Institute of Biological Sciences, Beijing (NIBS)
Title: **Cytosolic anti-bacterial immunity: sensing and execution**
- 09:50 – 10:25 Dr. **Yi Rao**, Dean, Division of Natural Sciences; Director, PKU-IDG /McGovern Institute for Brain Research; Chair Professor, School of Life Sciences, Peking University, Beijing, China
Title: **Chemoconnectomics (CCT)**
- 10:25 – 10:40 Coffee Break
- 10:40 – 11:15 Dr. **Xiao-Fan Wang**, Professor, Duke University
Title: **New insights into the mechanism underlying cellular senescence**
- 11:15 – 11:50 Dr. **Yigong Shi**, Vice President and Professor, Tsinghua University
Title: **Structural Basis of Pre-mRNA Splicing**
- 11:50 – 13:30 Lunch in the Hotel

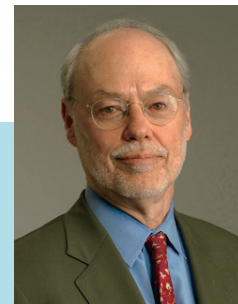
Afternoon Session (Han Dynasty Hall, 1st Floor)

- 13:30 – 14:05 Dr. **Charles Zuker**, Professor, Columbia University; Investigator, Howard Hughes Medical Institute (HHMI)
Title: **Receptors, Neurons, and Circuits: The Biology of Mammalian Taste**
- 14:05 – 14:40 Dr. **Minmin Luo**, Investigator, National Institute of Biological Sciences, Beijing (NIBS)
Title: **Reward processing by the dorsal raphe**
- 14:40 – 15:15 Dr. **Hong Zhang**, Investigator, Institute of Biophysics, Chinese Academy of Sciences
Title: **EPG5: tethering autophagosome maturation to Vici syndrome**
- 15:15 – 15:30 Coffee Break
- 15:30 – 16:05 Dr. **Heping Cheng**, Professor, Institute of Molecular Medicine, Peking University
Title: **Mitochondrial Flashes: Elemental Events of ROS Signaling and Beyond**
- 16:05 – 16:40 Dr. **Wenhui Li**, Investigator, National Institute of Biological Sciences, Beijing (NIBS)
Title: **Hepatitis B virus receptor**
- 16:40 – 17:15 Dr. **Bing Zhu**, Investigator, Institute of Biophysics, Chinese Academy of Sciences
Title: **Establishment and maintenance of epigenetic information**
- 17:15 – 17:50 Dr. **Xiaodong Wang**, Director and Investigator, National Institute of Biological Sciences, Beijing (NIBS)
Title: **Mitochondrial pathway of apoptosis**



Xiaodong Wang, Ph.D.
Director and Investigator,
National Institute of Biological Sciences, Beijing(NIBS)

Xiaodong Wang is currently the Director and Investigator of the National Institute of Biological Sciences, Beijing. He received his B.S. degree from Beijing Normal University and his Ph.D. degree in Biochemistry from the University of Texas Southwestern Medical Center at Dallas. After his postdoctoral training at the Department of Molecular Genetics at the same school, he started his independent research career at Emory University in Atlanta. He returned to UT-Southwestern in 1996 as a faculty member in the Department of Biochemistry held the George MacGregor Distinguished Professor chair until he returned to Beijing to take up his current position in 2010. He was also an Investigator of the Howard Hughes Medical Institute from 1997 to 2010. Xiaodong Wang's research centers on the biochemical understanding of programmed cell death in mammalian cells. His laboratory is responsible for the discovery of the role of cytochrome c in apoptosis, a finding that established the existence of a signaling function for mitochondria. Their more recent work identified RIP3 kinase and its substrate, MLKL, as core components of a pathway that controlling and executes programmed necrosis. For his research achievements, Xiaodong Wang was elected as a member of the National Academy of Sciences, USA. He is also a Foreign-associate member of both the Chinese Academy of Sciences and the European Molecular Biology Organization.



Phillip A. Sharp, Ph.D.
Institute Professor
Koch Institute for Integrative Cancer Research, Massachusetts
Institute of Technology

Dr. Phillip A. Sharp is an Institute Professor at the Massachusetts Institute of Technology, and member of the Department of Biology and Koch Institute for Integrative Cancer Research. His research focuses on gene expression and cancer and is noted for the discovery of the discontinuous gene structure in higher organisms for which he received the 1993 Nobel Prize in Physiology or Medicine. Dr. Sharp co-founded two innovative and successful biotech companies Biogen (1978) and Alnylam Pharmaceuticals (2002) developing RNA interference type therapeutics.



Feng Shao, Ph.D.
Investigator and Deputy Director for Academic Affairs
National Institute of Biological Sciences, Beijing (NIBS)

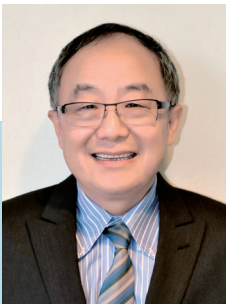
Dr. Feng Shao received his bachelor degree in chemistry from Peking University (1996) and his PhD degree in biological chemistry from the University of Michigan (2003). He joined the National Institute of Biological Sciences (NIBS), Beijing, as an assistant investigator in 2005, and is now a full investigator as well as being the Deputy Director for Research at NIBS. Dr. Shao's research focuses on molecular mechanism of bacterial infection and host innate immunity. His laboratory has discovered several cytosolic immune receptors/sensors for important bacterial products including LPS, flagellin, and the type III secretion apparatus, as well as bacterial toxins that modify/inactivate host Rho GTPases. He has also identified the Gasdermin D (GSDMD) protein as the pyroptosis substrate of inflammatory caspases, which acts downstream of the recognition of cytosolic bacteria. Dr. Shao's work further uncovered the membrane pore-forming activity of GSDMD and other Gasdermins, which has re-defined pyroptosis as Gasdermin family-mediated programmed necrosis. These studies have revealed how cells recognize/differentiate pathogenic and nonpathogenic bacteria and are paving the way to battling difficult infectious diseases such as sepsis. Dr. Shao has earned prestigious awards including the inaugural International Early Career Scientist Award from HHMI and the Irving Sigal Young Investigator Award from the Protein Society. He is a member of the Chinese Academy of Science, an associate member of the European Molecular Biology Organization (EMBO), and a Fellow of the American Academy of Microbiology.



Yi Rao, Ph.D.
Dean, Division of Natural Sciences
Director, PKU-IDG/McGovern Institute for Brain Research
Chair Professor, School of Life Sciences
Peking University, Beijing, China

饶毅。北京大学终身讲席教授，北京大学IDG/麦戈文脑研究所所长，北大 - 清华联合中心主任，北京大学校务委员会副主任，北京大学理学院主任。研究神经发育的机理、行为的分子和细胞机理。曾发现两个眼睛在发育中来源于同一形态发生场、发现Slit 为神经导向蛋白质、提出体细胞运动共同分子机理、发现争斗的中枢和外周机理、求偶的分子控制。

Yi Rao, Director of the PKU-IDG/ McGovern Institute for Brain Research and the Dean of the Division of Natural Sciences at Peking University. His past research interests concerned the molecular mechanisms of neural development, and his current interests are focused on the molecular and cellular mechanisms of behavior.



Xiao-Fan Wang, Ph.D.

Donald and Elizabeth Cooke Professor of Experimental Oncology
Professor of Pharmacology and Cancer Biology
Duke University Medical Center

Xiao-Fan Wang was born in Wulumuqi, China. He entered Wuhan University in 1978 to receive his college education following the reform of the education system. In 1982, as one of the first group of Chinese students sent to study biology in the US, he started his graduate training in the transcriptional regulation of immunoglobulin genes during B cell development with Dr. K. Calame at UCLA, and received his Ph.D. in 1986. He then spent five years at the Whitehead Institute and MIT as a postdoctoral fellow under the guidance of Dr. R. Weinberg. His main achievement during this period was the molecular cloning of transforming growth factor β (TGF- β) type II and type III receptors. In early 1992, he moved to the Duke University Medical Center as an Assistant Professor in the Department of Pharmacology & Cancer Biology. He is currently Professor of Pharmacology and Cancer Biology, and holds the chair of the Donald and Elizabeth Cooke Professor of Experimental Oncology. His current research interests are now focused on the mechanisms of tumor metastasis and cellular senescence. His other academic activities include serving on the editorial boards of a number of scientific journals, such as, for example, his role as an Associate Editor for the Journal of Biological Chemistry.



Yigong Shi, Ph.D.

Vice President and Professor, Tsinghua University

Yigong Shi is the Dean of the School of Life Sciences and a Special Assistant to the President of Tsinghua University. He received his Bachelor's Degree with highest honor from Tsinghua University in 1989 and Ph.D. in Biophysics at the Johns Hopkins University School of Medicine in 1995. Following a two-year postdoctoral research period at the Memorial Sloan-Kettering Cancer Center, he joined Princeton University as an Assistant Professor in 1998 and was promoted to Full Professor in 2003. He was named Warner-Lambert/Parke-Davis Professor of Molecular Biology in 2007. Dr. Shi resigned from Princeton University, declined an offer from the Howard Hughes Medical Institute, and returned to Tsinghua University in 2008.

Yigong Shi is a Fellow of the American Association for the Advancement of Science, an Honorary Foreign Member of the American Academy of Arts and Sciences, a Foreign Associate of the US National Academy of Sciences, and a Foreign Associate of the European Molecular Biology Organization.

Dr. Yigong Shi's research has provided important insights into both programmed cell death and regulated intramembrane proteolysis. His pioneering research on caspase activation, inhibition, and derepression markedly advanced our mechanistic understanding of programmed cell death. He is a world leader in the structural biology of cell signaling and macromolecular assemblies. He was a Searle Scholar and a Rita Allen Scholar. For his research contributions, Dr. Shi received prestigious recognition, including the 2003 Irving Sigal Young Investigator Award from the Protein Society, the 2010 Sackler Prize in Biophysics, and the 2014 Gregori Aminoff Prize from the Royal Swedish Academy of Sciences.



Charles Zuker, Ph.D.

Professor, Biochemistry and Molecular Biophysics and of Neuroscience
Columbia University College of Physicians and Surgeons
Investigator, Howard Hughes Medical Institute

Charles Zuker received his undergraduate degree from the Universidad Catolica de Valparaiso in Chile, and his PhD in molecular biology from the Massachusetts Institute of Technology, working with Harvey Lodish. After a postdoctoral fellowship with Gerald Rubin at the University of California, Berkeley, he became a faculty member and served as the Kevin and Tamara Kinsella Chair of Neurobiology and Distinguished Professor at the University of California, San Diego, School of Medicine. In 2009, after 22 years at UCSD, he moved to Columbia University College of Physicians and Surgeons as a Professor of Biochemistry and Molecular Biophysics and of Neuroscience. Dr. Zuker is also an Investigator of the Howard Hughes Medical Institute and a Senior fellow at the Janelia Farm Research Campus.

Dr. Zuker is recognized for his studies on how the brain represents our sensory experiences and how it transforms reception into perception. His work has led to new insights into the biology of photoreception, mechanoreception, and more recently taste reception. Over the past several years, his laboratory has identified the cells mediating all five basic taste qualities (sweet, sour, bitter, salty and umami) and helped uncover the logic of taste coding, both at the periphery and in the cortex. Dr. Zuker's work has been acknowledged by many awards, and he is an elected member of the American Academy of Arts and Sciences, the National Academy of Sciences, and the National Academy of Medicine.



Minmin Luo, Ph. D.

Investigator, National Institute of Biological Sciences, Beijing (NIBS)

Dr. Minmin Luo is an Investigator at the National Institute of Biological Sciences (NIBS), Beijing, and a professor at the School of Life Sciences, Tsinghua University. He majored in psychology at Peking University and received an MS degree in computer sciences and a Ph.D. degree in neuroscience from the University of Pennsylvania. After completing postdoctoral training at Duke University, he set up an independent research group and has been carrying out his research program at NIBS since 2005. He has also performed undergraduate and graduate teaching as a professor at Tsinghua University since 2009. His research interests mainly focus on exploring the mammalian neural circuits and the molecular cellular mechanisms underlying the processing of reward and punishment signals. By combining electrophysiology, optogenetics, molecular genetics, and behavioral assays, his research group has in recent years discovered that serotonergic neurons in the dorsal raphe nucleus encode state beneficialness, produce reward signals through serotonin and glutamate, and represent a hotspot in the brain reward system. Moreover, he recently discovered that cholinergic neurons in the medial habenular core release glutamate, and presynaptic excitation of GABA_B facilitates fear memory extinction. The malfunctions of these two groups of neurons participate in several psychiatric disorders, including depression, schizophrenia, addiction, and phobia. His group will continue to study how these neurons and their interconnected neural circuits organize and modulate behaviors associated with reward and punishment processing, how their changes contribute to the etiology of mental disorders, and how potential targets can be intervened with via small molecules to treat related diseases.



Hong Zhang, Ph.D.

Investigator, Institute of Biophysics, Chinese Academy of Sciences

Dr. Hong Zhang is an Investigator in the Institute of Biophysics, of the Chinese Academy of Sciences (CAS). He graduated from Albert Einstein College of Medicine and conducted his postdoctoral training in the Massachusetts General Hospital Cancer Center of Harvard Medical School. Before joining the Institute of Biophysics, CAS in 2012, he was an Assistant Investigator (2004-2009) and Associate Investigator (2009-2012) at the National Institute of Biological Sciences, Beijing. The research in his lab currently focuses on the molecular mechanisms of the autophagic machinery, the regulation of autophagy activity during development, and the physiological function of autophagy. The awards he has won in recent years include the 6th C.C. Tan (Jia-Zhen Tan) Life Science Award (2013), the National Outstanding Young Scientist Award (2012), and the HHMI International Early Career Scientist Award (2012). Dr. Hong Zhang is on the Board of Reviewing Editors for eLife, is an Associate Editor for Autophagy, and is also on the editorial Board for the Journal of Cell Science, EMBO reports, and JBC.



Heping (Peace) Cheng

Professor
Laboratory of Ca²⁺ Signaling and Mitochondrial Biomedicine
Institute of Molecular Medicine
Peking University

With multidisciplinary training in mathematics, physics, biology, and electronic engineering at Peking University, China, Heping (Peace) Cheng received his PhD degree in Physiology in 1995 from the University of Maryland at Baltimore, USA. He then spent a decade at the laboratory of Cardiovascular Science in the National Institute on Aging, NIH, USA, becoming a Senior Investigator with tenure in 2004. He was elected to the Chinese Academy of Sciences in 2013.

Peace's scientific motivation is to decipher physiological principles underlying cellular functions and signaling. During his PhD studies, Peace discovered "calcium sparks"—elementary events of excitation-contraction coupling in heart cells. Through two decades of vigorous innovation, Peace and collaborators have uncovered a molecular trilogy of cardiac excitation-contraction coupling processes—Ca²⁺ sparklets arise from the opening of single L-type Ca²⁺ channels and trigger Ca²⁺ sparks via the Ca²⁺-induced Ca²⁺ release mechanism; at the same time, Ca²⁺ blinks, the reciprocal Ca²⁺ signal in the sarcoplasmic reticulum, reveal a surprisingly large local Ca²⁺ depletion that helps to terminate the ongoing spark. By devising a nanodomain-targeting strategy, he has further characterized Ca²⁺ nanosparks in the dyadic clefts. More recently, Peace and collaborators made the serendipitous discovery that mitochondrial "flashes", which reflect elemental and ubiquitous mitochondrial signaling events that participate in vital physiological processes, from metabolism to cell-fate regulation, and from stress responses to aging. These findings have revolutionized our view of cellular Ca²⁺ and ROS signaling, their hierarchical organization, dynamism, and design principles to achieve, all at once, signaling versatility, specificity, and efficiency.



Wenhui Li, Ph.D.

Investigator, National Institute of Biological Sciences, Beijing (NIBS)

Wenhui Li is an Investigator of the National Institute of Biological Sciences (NIBS), Beijing, China. He received a bachelor's degree in medicine from the Medical School of Lanzhou University in 1994 and his Ph.D. from the Peking Union Medical College & the Chinese Academy of Medical Sciences in 2001. After completing his postdoctoral studies at Harvard Medical School, Dr. Li joined NIBS in late 2007. For the past several years, his team at NIBS has been focusing on deepening our understanding of hepatitis B virus (HBV) infection. HBV infects 240 million people worldwide, and the infection is a major cause of cirrhosis and hepatocellular carcinoma in humans. How the virus invades human liver cells had remained enigmatic since the discovery of the virus four decades ago, until 2012, when Dr. Li and his group revealed that a liver bile acid transporter (sodium taurocholate cotransporting polypeptide, Ntcp) is the cellular receptor for HBV and its satellite, the hepatitis D virus (HDV). The discovery of the HBV receptor has answered several long-standing and important questions in the field, including why HBV specifically targets the human liver. The finding has also enabled a convenient Ntcp-based HBV/HDV infection platform for both studying the basic biology of the viruses and for developing new treatments. By using this new infection system, they recently found that host DNA polymerase Kappa is a key host factor required for the formation of HBV covalently closed circular DNA (the reservoir of HBV in hepatocytes) during a de novo HBV infection. They also established a new mouse model for studying HDV infection and evaluating HBV/HDV entry inhibitors. Currently, Dr. Li's laboratory combines virology, biochemistry, immunology, and chemical biology to investigate the molecular mechanisms of HBV/HDV infection; the team also collaborates with other colleagues to study Ntcp/bile acids for their roles in HBV infection and related diseases.



Bing Zhu, Ph. D.

Investigator, Institute of Biophysics, Chinese Academy of Sciences

Bing Zhu's lab studies the establishment and maintenance of epigenetic information, using combinatory approaches including biochemistry, quantitative mass spectrometry, high throughput sequencing, mouse genetics, and chemical biology. Bing Zhu's lab systematically investigated the pattern of nucleosomal histone partitioning during DNA replication, the establishment kinetics of histone methylation marks at post-replication chromatin, and the regulatory mechanisms of histone modifying enzymes. These findings have been important contributions in the development of the so-called feedback buffer model for explaining mitotic inheritance of histone modifications. These studies have also been instructive for the rational design of small molecule compounds targeting these enzymes. More recently, Bing Zhu's lab discovered several novel regulatory mechanisms for the dynamics of DNA methylation.



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