

Abstracts of papers presented
at the 2026 Cold Spring Harbor Asia Conference

CROSS-SCALE BIOLOGICAL STRUCTURE: FROM MACROMOLECULAR COMPLEXES & ORGANELLES TO CELLS & TISSUES

August 31–September 4, 2026

Arranged by

Masahide Kikkawa, *The University of Tokyo*

Hongwei Wang, *Tsinghua University*

Peijun Zhang, *University of Oxford*



Cold Spring Harbor Conferences Asia
Cold Spring Harbor Laboratory



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**CROSS-SCALE BIOLOGICAL STRUCTURE:
FROM MACROMOLECULAR COMPLEXES & ORGANELLES
TO CELLS & TISSUES**

Monday, August 31 – Friday, September 4, 2026

Monday	7:00 pm	1 Keynote Session
Tuesday	9:00 am	2 Native Assemblies, Regulatory Machines and Membrane Remodeling
Tuesday	2:00 pm	Poster Session
Tuesday	7:00 pm	3 Methods that Expand cryo-EM/ET Across Scales
Wednesday	9:00 am	4 Virus Infection and Cell-Surfaces Interfaces
Wednesday	1:30 pm	<i>Visit to Old Suzhou</i>
Wednesday	7:00 pm	5 Cross-scale Imaging and Spatial Context
Thursday	9:00 am	6 Specialized Cellular Structures, Motility and Molecular Machines
Thursday	2:00 pm	7 Diverse Biological Assemblies
Thursday	5:00 pm	<i>Cocktails and Banquet</i>
Friday		<i>Departure</i>

Oral presentation sessions are located in the CSHA Auditorium

Poster session is in the Lake Front Hall.

Cocktail social hour is held in the Grand Ballroom Foyer

Old Suzhou visits depart from the CSHA lobby

**optional tour requires additional fee.*

Meal locations and times are as follows:

Lunch: Main Cafeteria 12:00am - 1:30pm

Dinner: Main Cafeteria 6:00pm - 7:30pm

Banquet: Grand Ballroom 6:00 pm

More information will be available at CSHA office.

(Map at the end of this abstract book)

PROGRAM

MONDAY, August 31—7:00 PM

OPENING REMARKS

Hongwei Wang
Tsinghua University

SESSION 1 KEYNOTE SESSION

Chairperson: **Peijun Zhang**, University of Oxford, Oxford, United Kingdom

Structural biology *in situ*—The promise and challenges of cryo-electron tomography

Wolfgang Baumeister [35'+10']

Presenter affiliation: Max Planck Institute of Biochemistry, Martinsried, Germany.

1

High-resolution cryoEM of mitochondrial ATP synthase and complex I

Werner Kühlbrandt [35'+10']

Presenter affiliation: Max Planck Institute of Biophysics, Frankfurt am Main, Germany.

2

TUESDAY, September 1—9:00 AM

SESSION 2 NATIVE ASSEMBLIES, REGULATORY MACHINES AND MEMBRANE REMODELING

Chairperson: **Masahide Kikkawa**, University of Tokyo, Tokyo, Japan

Structural analysis of synaptic transmission and plasticity

Guoqiang Bi [20'+10']

Presenter affiliation: University of Science and Technology of China, Hefei, China; CAS Shenzhen Institute of Advanced Technology, Shenzhen, China.

3

Unveiling molecular crowding in situ with cryo-electron tomography

Qiang Guo [20'+10']

Presenter affiliation: Peking University, Beijing, China.

4

Architecture and assembly principles of native cytoplasmic lattices from mammalian oocytes

Miao Gui [10'+5']

Presenter affiliation: Zhejiang University, Hangzhou, China.

5

Break

Activation and regulation of RyR1 in native membranes by cryo-EM/eT

Misha Kudryashev [20'+10']

Presenter affiliation: Max Delbrück Center for Molecular Medicine, Berlin, Germany.

6

Probing the structural mechanisms of ESCRT-mediated membrane remodeling by cryo-eM

Carsten Sachse [20'+10']

Presenter affiliation: Forschungszentrum Jülich, Jülich, Germany.

7

Architecting the membrane—Tetraspanin 7 assembles a transmembrane skeleton

Dongju Wang, Xia Jia, Raviv Dharan, Jiahao Ren, Yi Zheng, Xiaopeng Li, Mingtao Huang, Kui Xu, Qi Zhang, Takami Sho, Siyuan Liu, Fan Yang, Qiangfeng Cliff Zhang, Raya Sorkin, Nan Liu, Hong-Wei Wang, Li Yu [10'+5']

Presenter affiliation: State Key Laboratory of Membrane Biology, Tsinghua University-Peking University Joint Centre for Life Sciences, Beijing, China; Tsinghua University, Beijing, China.

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POSTER SESSION

Ultrasensitive mass spectrometry enables proteomic analysis of single cryo-FIB lamellae from biological tissues

Monica Pia Caggiano, Malcolm Wells, Sven Klumpe, Rosa Viner, Fernanda Salvato, Alex de Marco
Presenter affiliation: New York Structural Biology Center, New York, New York.

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Cryo-EM structures of highly ordered CD40-CD40 clusters on artificial and cellular membranes

Min Gyu Woo, Chan Seok Lim, Jie-Oh Lee
Presenter affiliation: POSTECH, Pohang, South Korea.

10

Rad51 engages RNA-DNA hybrids and ssRNA via distinct binding modes

Xingchen Liu, Meng Tian, Xin Ke, Hong-Wei Wang
Presenter affiliation: School of Life Sciences, Beijing, China.

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Structural and functional insights into ligand recognition and regulation of human potassium channel GIRK4

Li Pu, Wenhe Wang, Zi Yang, Lin Ge, Sensen Zhang, Maojun Yang
Presenter affiliation: Tsinghua University, Beijing, China.

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3D bioprinting of bio-orthogonally crosslinked microporous scaffolds using monodisperse hydrogel microparticles enables mechanotransduction analysis

Xinyang Shao, Yifan Wang, Zhizhao Liao, Chunhong Zheng, Guanbo Wang, Yanyi Huang
Presenter affiliation: Peking University, Beijing, China.

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α Tub67C enables fly embryonic rapid mitosis and female fertility by accelerating microtubule turnover

Kexun Wu, Xin Liang
Presenter affiliation: Tsinghua University, Beijing, China.

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Microtubule-membrane coupling governs receptor organization and architecture of sensory dendrites

Jingru Yang, Xin Liang
Presenter affiliation: Tsinghua University, Beijing, China.

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In situ structures reveal dynamic phycobilisome-photosystem coupling in thylakoid-free cyanobacteria

Xin You, Xing Zhang, Xinyu Zhao, Ziyi Wang, Shan Sun, Sen-Fang Sui
Presenter affiliation: Tsinghua University, Beijing, China.

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Structural alteration of phycobilisomes during nitrogen chlorosis in *Synechococcus elongatus* PCC 7942

Xinyu Zhao, Yun Zhu, Xin You, Kailun Li, Fei Sun, Senfang Sui
Presenter affiliation: Tsinghua University, Beijing, China.

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TUESDAY, September 1—7:00 PM

SESSION 3 METHODS THAT EXPAND CRYO-EM/ET ACROSS SCALES

Chairperson: **Carsten Sachse**, Forschungszentrum Jülich, Jülich, Germany

Removing bottlenecks in cryo-electron tomography, from liftout to annotation

Alex de Marco, Monica Pia Caggiano, Rohit Kannachel, Jake Johnston, Eugene Chua [20'+10']
Presenter affiliation: New York Structural Biology Center, New York, New York.

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Laser phase plate in cryoEM

Holger Mueller [20'+10']
Presenter affiliation: University of California, Berkeley, California.

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Using light to dissect and direct cellular organization and dynamics

Lukas Kapitein [20'+10']
Presenter affiliation: Utrecht University, Utrecht, the Netherlands.

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Next-generation ESI-cryoPrep—A versatile, blotting-free cryo-EM sample preparation solution for challenging macromolecules under near-native conditions

Zheng Pang, Liwen Liang, Zheng Ouyang, Hong-Wei Wang [10'+5']
Presenter affiliation: Tsinghua University, Beijing, China.

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SESSION 4 **VIRUS INFECTION AND CELL-SURFACE INTERFACES**

Chairperson: **Misha Kudryashev**, Max Delbruck Center for Molecular Medicine, Berlin, Germany

Cross-scale imaging of virus infection

Peijun Zhang [20'+10']

Presenter affiliation: University of Oxford, Oxford, United Kingdom. 22

Cross-scale analysis of correlative light and electron microscopy

Kanta Naruse, Namiki Toyama, Haruaki Yanagisawa, Satoru Fujiyoshi, Masahide Kikkawa [20'+10']

Presenter affiliation: The University of Tokyo, Tokyo, Japan. 23

Break

Microtubule-membrane coupling governs receptor organization and architecture of sensory dendrites

Jing-Ru Yang, Xin Liang [20'+10']

Presenter affiliation: Tsinghua University, Beijing, China. 24

Viral replication organelles—From double membrane vesicles to single membrane spherules

Xiang Fang, Le Zheng, Chenxi Wang, Haibo Jiang, Zi-wei Ye, Tao Ni [10'+5']

Presenter affiliation: The University of Hong Kong, Hong Kong, China. 25

Mechanical stress promotes pancreatic cancer metastasis via cytoskeleton remodeling induced entosis

Chenxue Yin, Chengcheng Wang, Yupei Zhao [10'+5']

Presenter affiliation: Peking Union Medical College Hospital, Beijing, China. 26

WEDNESDAY, September 2—7:00 PM

SESSION 5 CROSS-SCALE IMAGING AND SPATIAL CONTEXT

Chairperson: **Alex de Marco**, New York Structural Biology Center,
New York, USA

CryoSeek—A structure-first paradigm for discovery

Nieng Yan [20'+10']

Presenter affiliation: Shenzhen Medical Academy of Research and
Translation (SMART), Shenzhen, China.

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**Cellomics and 3D spatial omics—Diving into whole-sample
spatial contexts**

Etsuo A. Susaki [20'+10']

Presenter affiliation: Juntendo University Graduate School of Medicine,
Tokyo, Japan; National Institutes for Quantum Science and
Technology, Chiba, Japan.

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**Magnetic quantum sensing for life science with an optimal
sensitivity spin sensor in diamond**

Fazhan Shi [20'+10']

Presenter affiliation: University of Science and Technology of China,
Hefei, China.

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**Unveiling the 3D architecture of human retinal photoreceptors
using cryogenic volume electron microscopy**

Gong-Her Wu, Risa Kawasak, Pingting Liu, Hirenkumar Patel, Y.
Joyce Liao, Wah Chiu [10'+5']

Presenter affiliation: Stanford University, Stanford, California.

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THURSDAY, September 3—9:00 AM

SESSION 6 SPECIALIZED CELLULAR STRUCTURES, MOTILITY
AND MOLECULAR MACHINES

Chairperson: **Qiang Guo**, Peking University, Beijing, China

In situ structural insights into asthenozoospermia

Fei Sun [20'+10']

Presenter affiliation: Chinese Academy of Sciences, Guangzhou,
China; Chinese Academy of Sciences, Beijing, China.

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Cryo-EM single particle analysis meets cryo-ET at the sperm tail
Tzviya Zeev-Ben-Mordehai [20'+10']
 Presenter affiliation: Utrecht University, Utrecht, the Netherlands. 32

Break

Structural mechanism of supercoiling of the bacterial flagellar filaments by two-state conformations of flagellin
 Fumiaki Makino, Miki Kinoshita, Kasim Waraich, Tomoko Miyata, Tohru Minamino, Keiichi Namba [20'+10']
 Presenter affiliation: The University of Osaka, Suita, Japan. 33

Structural basis for differential cofactor-regulated dicer-mediated isomiR biogenesis
Jia Wang, Hong-Wei Wang [10'+5']
 Presenter affiliation: Soochow University, Suzhou, China. 34

Cryo-EM with a laser phase plate
Jessie Zhang [10'+5']
 Presenter affiliation: University of California, Berkeley, Berkeley, California. 35

THURSDAY, September 3—2:00 PM

SESSION 7 DIVERSE BIOLOGICAL ASSEMBLIES AND FUTURE PERSPECTIVE

Chairperson: **Tzviya Zeev-Ben-Mordehai**, Utrecht University, Utrecht, the Netherlands.

In situ structure of rabies virus by cryo-EM analysis
 Xing Zhang, Zhixian Sun, Yan Zhang, Changchun Tu, Zhiyong Lou, Hong-Wei Wang [20'+10']
 Presenter affiliation: Tsinghua University, Beijing, China. 36

High-resolution cryo-EM meets parasitology—Structure of the conoid from toxoplasma gondii
Rui Zhang [20'+10']
 Presenter affiliation: Washington University in St. Louis, School of Medicine, St. Louis, Missouri. 37

Repertoire-scale antibody structural prediction informs therapeutic design

Zhe Sang, Yufei Xiang, Wei Huang, Paul R. Sargunas, Yong Joon (Jeffery) Kim, Zirui Feng, Derek J. Taylor, Yi Shi [10'+5']

Presenter affiliation: Icahn School of Medicine at Mount Sinai, New York, New York. 38

Break

Coordinated stages and molecular sociology of cytokinesis of an archaeal cell with protein-only cell wall

Hui Wang, Angela Agnew, Melissa Peng, Nagaa Joseph, Ethan Humm, Robert P. Gunsalus, Z. Hong Zhou [20'+10']

Presenter affiliation: UCLA, Los Angeles, California. 39

High-resolution CryoEM of small cancer proteins via I53-50 nanoparticle display and *de novo* binders

Hongbo Zhu, Roman Aguirre, Z. Hong Zhou [10'+5']

Presenter affiliation: University of California, Los Angeles (UCLA), Los Angeles, California. 40

Mesoscale intravital fluorescence microscopy—A decades-long journey from concept to innovation

Qionghai Dai.

Presenter affiliation: Tsinghua University, Beijing, China. 41

THURSDAY, September 3—5:00 PM

COCKTAILS and BANQUET

FRIDAY, September 4

Departure