

Abstracts of papers presented
at the 2024 Cold Spring Harbor Asia Conference

CHEMICAL BIOLOGY & DRUG DISCOVERY

May 27–May 31, 2024

Arranged by

Young-Tae Chang, *Pohang University of Science and Technology*
Haian Fu, *Emory University School of Medicine*
Giulio Superti-Furga, *Austrian Academy of Sciences*
Liyun Zhang, *Nankai University*



Cold Spring Harbor Conferences Asia
Cold Spring Harbor Laboratory



CHEMICAL BIOLOGY & DRUG DISCOVERY

Monday, May 27 – Friday, May 31, 2024

Monday	7:00 pm	1 Transporters for Chemical Biology
Tuesday	9:00 am	2 Chemical Probe
Tuesday	2:00 pm	Poster Session
Tuesday	3:00 pm	<i>Chinese Tea and Beer Tasting</i>
Tuesday	7:00 pm	3 Chemoproteomics
Wednesday	9:00 am	4 Bioimaging
Wednesday	2:00 pm	<i>Visit to Old Suzhou*</i>
Wednesday	7:00 pm	5 Chemical Biology I
Thursday	9:00 am	6 Chemical Biology II
Thursday	2:00 pm	7 Drug Discovery I
Thursday	6:00 pm	Cocktails and Banquet
Friday	9:00 am	8 Drug Discovery II

Oral presentation sessions are located in the CSHA Auditorium
Poster session and Chinese Tea & Beer Tasting are in the Lake Front Hall.

Cocktail social hour is held outside in the Suz Garden.

Old Suzhou visits depart from the CSHA lobby

**optional tour requires additional fee.*

Meal locations and times are as follows:

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

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

Banquet: Suz Garden 7:00pm

More information will be available at CSHA office.

(Map at the end of this abstract book)

PROGRAM

MONDAY, May 27—7:00 PM

SESSION 1 TRANSPORTERS FOR CHEMICAL BIOLOGY

Chairperson: **Young-Tae Chang**, Pohang University of Science and Technology (POSTECH), Pohang, Korea

KEYNOTE SPEAKER

Understanding and modulating disease by targeting SLC transporters

Giulio Superti-Furga, Vojtech Dvorak, Patrick Essletzbichler, Andras Boeszoermenyi, Leonhard X. Heinz, Manuele Rebsamen, Ariel Bensimon, Enrico Girardi, Yee-Kwan Law, Evandro Ferrada, Fabian Frommelt, Ulrich Goldmann, Maojun Yang, Tabea Wiedmer [35'+10']
Presenter affiliation: CeMM Research Center for Molecular Medicine of the Austrian Academy of Sciences, Vienna, Austria; Medical University of Vienna, Vienna, Austria.

1

Live cell distinction using fluorescent probes

Young-Tae Chang [20'+5']
Presenter affiliation: POSTECH, Pohang, South Korea.

2

Antibody-guided targeted protein degradation

Jiang Xia, Dingdong Yuan, Yishu Bao, Zhiyi Xu [10'+5']
Presenter affiliation: The Chinese University of Hong Kong, Hong Kong, China.

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SESSION 2 CHEMICAL PROBE

Chairpersons: **Seung Bum Park**, Seoul National University, Seoul, Korea
Peng Chen, Peking University, Beijing, China

Bioorthogonal chemistry-enabled spatial-temporal proteomics

Peng R. Chen [20'+5']

Presenter affiliation: Peking University, Beijing, China.

4

Targeted protein upregulation potentiates STING agonist immunotherapy

Seung Bum Park [20'+5']

Presenter affiliation: Seoul National University, Seoul, South Korea; SPARK Biopharma, Seoul, South Korea.

5

Metabolic reprogramming based islet regeneration

Jin Li [10'+5']

Presenter affiliation: Fudan University, Shanghai, China.

6

Development of abiotic metal catalytic subsystems working in eukaryotic cells

Yugang Bai, Tong Wu, Yating Fei, Yingjiao Deng [10'+5']

Presenter affiliation: Hunan University, Changsha, Hunan, China.

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Break

Deciphering the glycode by chemical biology approaches

Xing Chen [20'+5']

Presenter affiliation: Peking University, Beijing, China.

8

N-Acryloylindole-alkynes (NAIAs) as chemoproteomic probes to identify new ligandable cysteines and discover therapeutic covalent ligands

Clive Yik-Sham Chung [10'+5']

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

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Unusual MurC discovered in Lachnospiraceae via developing a selective labeling probe for gut microbiota

Wei Wang [10'+5']

Presenter affiliation: Fudan University, Shanghai, China.

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POSTER SESSION

- A systematic analysis of label-free chemical proteomics approaches for large-scale target deconvolution**
Yuanming Bi, Ya Zeng, Soon Heng Chris Tan
Presenter affiliation: Southern University of Science and Technology, Shenzhen, China. 11
- Reprogramming protein translation in spatiotemporal stress response**
Dalu Chang, Chayasith Uttamapinant, Yimon Aye
Presenter affiliation: EPFL, Lausanne, Switzerland. 12
- NDR1-MYC interaction peptide disruptor MN3-TAT suppresses MYC-dependent colorectal cancer**
Jiani Lu, Pengcheng Qin, Hongtao Li, Yexi Li, Danmei Yu, Ye Wu, Xin Luan, Hongzhuan Chen, Haian Fu, Lili Chen
Presenter affiliation: Shanghai University of Traditional Chinese Medicine, Shanghai, China. 13
- Probing the molecular mechanism of action of kenpaullone in lymphangiogenesis**
Caroline A. Cuoco, Christophe Ravaud, Paul R. Riley, Angela J. Russell
Presenter affiliation: University of Oxford, Oxford, United Kingdom. 14
- Peptide ligand screening using the bacterial type 1 secretion system in microdroplets**
Tobias V. Eden, Julius Fredens
Presenter affiliation: National University of Singapore, Singapore. 15
- Automated high-throughput activity-based protein profiling facilitates covalent drug discovery**
Yumeng Li, Zhenze Jiang
Presenter affiliation: China Innovation Center of Roche, Shanghai, China. 16
- Gel-based prefractionation for functional characterization of proteoforms and their drug interaction by thermal proteome and co-aggregation analysis**
Fengming Li, Ya Zeng, Yue Li, Chris Soon Heng Tan
Presenter affiliation: Southern University of Science and Technology, Shenzhen, China. 17

- Heterobifunctional molecular system for regulation of cellular signaling transduction and subcellular organelle homeostasis**
Songhan Liu, Bengang Xing
 Presenter affiliation: Nanyang Technological University, Singapore. 18
- Chemical biology approaches to target the “undrugged” SMAD4 protein**
 Pooja Kumari, Xiulei Mo
 Presenter affiliation: Emory University, Atlanta, Georgia. 19
- Peptide functionalization improves the therapeutic index of glucocorticoid drugs for treating inflammatory diseases**
 Xian Wu, Hong Guo, Hui Gao, Hongbo Pang
 Presenter affiliation: University of Minnesota, Minneapolis, Minnesota. 20
- Hypoxic exosomal circPLEKHM1-mediated crosstalk between tumor cells and macrophages drives lung cancer metastasis**
Shuang Tang, Dongliang Wang, Shuoer Wang, Shaoli Song
 Presenter affiliation: Fudan University Shanghai Cancer Center, Shanghai, China. 21
- Dissecting the mechanism of action for metformin with thermal proteome and co-aggregation analysis**
Ya Zeng, Yuanming Bi, Zhenxiang Zheng, Soon Heng Tan
 Presenter affiliation: Southern University of Science and Technology, Shenzhen, China; Hong Kong Baptist University, Hong Kong, China. 22
- Mapping protein complexes perturbed by chemical modulators of autophagy and mitophagy with thermal proximity co-aggregation**
Shuang Zhang, Fengming Li, Bin Liao, Jun Wang, Ya Zeng, Soon Heng Tan
 Presenter affiliation: Southern University of Science and Technology, Shenzhen, Shenzhen, China. 23
- Charting interactome dynamics during ovarian aging in mice and by anti-aging chemicals with thermal proteome and proximity**
Miao Zhao, Soon Heng Tan
 Presenter affiliation: Southern University of Science and Technology, Shenzhen, China. 24

TUESDAY, May 28—3:00 PM

Chinese Tea and Beer Tasting

SESSION 3 CHEMOPROTEOMICS

Chairpersons: **Peng Zhou**, Peking University, Beijing, China
Alessio Ciulli, University of Dundee, Dundee,
United Kingdom

How PROTAC degraders work—Molecular recognition and design principles

Alessio Ciulli [20'+5']

Presenter affiliation: University of Dundee, Dundee, United Kingdom. 25

Mapping drug-protein and protein-protein interactions at scale with protein cellular biophysics and mass spectrometry

Chris Soon Heng Tan [10'+5']

Presenter affiliation: Southern University of Science & Technology, Shenzhen, China; Shenzhen Bay Laboratory, Shenzhen, China. 26

Increasing throughput of label-free chemical proteomics approaches with matrix-augmented pooling strategy and data-independent acquisition

Qiqi Wang, Hongchao Ji, Soon Heng Tan [10'+5']

Presenter affiliation: Southern University of Science and Technology, Shenzhen, China. 27

Break

Spatially resolved mapping of subcellular biomolecules via photocatalytic and immuno-proximity labeling

Peng Zou [20'+5']

Presenter affiliation: Peking University, Beijing, China. 28

Chemoproteomic interrogation of protein glutamine serotonylation

Rongsheng Zeng, Yuanhong Cai, Zheng Liu, Haitao Li, Xiang David Li,
Xin Li [10'+5']

Presenter affiliation: Shenzhen Bay Laboratory, Shenzhen, China. 29

The use of bioorthogonal metabolic labeling in aerospace biomedical research—Microgravity effects on the brain and gut bacteria

Xin Zhang, Zhujun Wu, Yulin Deng, Zhimin Wang [10'+5']

Presenter affiliation: Beijing Institute of Technology, Beijing, China. 30

SPONSOR TALK

Building a proteome-wide resource for protein sciences

Tao Chen [20'+5']

Presenter affiliation: Absea Biotechnology Ltd., Berlin, Germany.

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WEDNESDAY, May 29—9:00 AM

SESSION 4 BIOIMAGING

Chairpersons: **Bengang Xing**, Nanyang Technological University, Singapore
Dirk Trauner, University of Pennsylvania, Philadelphia, Pennsylvania, USA

Ion channels as an inspiration for synthetic chemists

Dirk Trauner [20'+5']

Presenter affiliation: University of Pennsylvania, Philadelphia, Pennsylvania.

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⁶⁸Ga-FAPI PET imaging monitors response to combined TGF- β R inhibition and immunotherapy in metastatic colorectal cancer

Shuang Tang, Ke Li, Wei Liu, Shaoli Song [10'+5']

Presenter affiliation: Fudan University Shanghai Cancer Center, Shanghai, China.

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Fluorogenic and cell-permeable rhodamines for live-cell protein labeling in superresolution imaging and biosensing

Lu Wang [10'+5']

Presenter affiliation: Fudan University, Shanghai, China.

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Break

Bioorthogonal click conjugation for NIR fluorescent imaging and ENCTACs epigenetic therapeutic deactivation

Bengang M. Xing, Songhan M. LIU [20'+5']

Presenter affiliation: Nanyang Technological University, Singapore.

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Fixable fluorescence quenched substrates that enable simultaneous cell-based imaging of lysosomal enzyme activities and protein markers

Sha Zhu, Matthew C. Deen, Yanping Zhu, Pierre-André Gilormini, Xi Chen, Oliver B. Davis, Marcus Y. Chin, Anastasia G. Henry, David J. Vocadlo [10'+5']

Presenter affiliation: Simon Fraser University, Burnaby, Canada. 36

Medicinal chemical biology study of photo-catalytic redox reaction in cancer cells

Huaiyi Huang [10'+5']

Presenter affiliation: Sun Yat-sen University, GuangZhou, China. 37

Decoding and targeting transcriptional dysregulation in triple-negative breast cancer with chemical probes

Qin Wu [10'+5']

Presenter affiliation: Hangzhou Institute of Medicine (HIM), Chinese Academy of Sciences, Hangzhou, China. 38

Human pluripotent stem cells, organoids and drug screening

Shuibing Chen [20'+5']

Presenter affiliation: Weill Cornell Medicine, New York, New York. 39

WEDNESDAY, May 29—2:00 PM

Visit to Old Suzhou

WEDNESDAY, May 29—7:00 PM

SESSION 5 CHEMICAL BIOLOGY I

Chairpersons: **Motonari Uesugi**, Kyoto University, Kyoto, Japan
Quan Chen, Nankai University, Tianjin, China

Small molecule agonist of mitofusin 1 repairs mitochondrial dysfunction

Quan Chen [20'+5']

Presenter affiliation: Nankai University, Tianjin, China. 40

Some new insights into aging and reverse aging with comparative views of animal and plant aging

Hong Gil Nam [20'+5']

Presenter affiliation: The Ever Summer Labs for Aging Research, Deagu, South Korea; Reverse Aging Labs, Seoul, South Korea. 41

Chemical biology of self-assembly

Motonari Uesugi [20'+5']

Presenter affiliation: Kyoto University, Kyoto, Japan. 42

THURSDAY, May 30—9:00 AM

SESSION 6 CHEMICAL BIOLOGY II

Chairpersons: **Sek Tong Derric Ong**, National University of Singapore, Singapore
Yan-Mei Li, Tsinghua University, Beijing, China

Photo-controllable bioorthogonal reactions and biomolecules

Jinbo Li, Ziwei Xi, Yan Zhang [20'+5']

Presenter affiliation: Nanjing University, Nanjing, China. 43

Targeted protein O-GlcNAcylation using bifunctional small molecules

Bowen Ma, Khadija Shahed Khan, Tongyang Xu, Josefina Xequé Amada, Zhihao Guo, Yunpeng Huang, Yu Yan, Henry Lam, Alfred Sze-Lok Cheng, Billy Wai-Lung Ng [10'+5']

Presenter affiliation: The Chinese University of Hong Kong, Hong Kong, China. 44

Harnessing the power of small molecules to develop better CRISPR systems and vice versa

Ju Zhang, Li Chen, Shixian Wei, Yu Wang [10'+5']

Presenter affiliation: Shenzhen University, Shenzhen, China. 45

Break

Synthesis of solar fuel by photoelectrocatalysis of enzymes

Haishuo Ji, Wenjin Li, Yanxin Gao, Liyun Zhang [20'+5']

Presenter affiliation: Nankai University, Tianjin, China. 46

Applying chemical biology approaches to expand our molecular understanding of glioblastoma pathogenesis

Derrick Ong [20'+5']

Presenter affiliation: National University of Singapore, Singapore. 47

Developing photosynthetic cell factories for value-added products

Yixi Su, Jiwei Chen, Jingyan Hu, Cheng Qian, Jiahao Ma, Sigurður Brynjólfsson, Weiqi Fu [10'+5']

Presenter affiliation: Zhejiang University, Zhoushan, China; University of Iceland, Reykjavík, Iceland. 48

Multidisciplinary studies of glycans—A case report

Ran Xie [10'+5']

Presenter affiliation: Nanjing University, Jiangsu, China. 49

THURSDAY, May 30—2:00 PM

SESSION 7 DRUG DISCOVERY I

Chairpersons: **Zijian Guo**, Nanjing University, Nanjing, China
Lixin Zhang, East China University of Science and Technology, Shanghai, China

From symphony to intelligent manufacturing™ of Porphyrins

Lixin Zhang [20'+5']

Presenter affiliation: East China University of Science and Technology, Shanghai, China. 50

From inorganic chemical biology to drug development against emerging infectious diseases

Hongzhe Sun, Hongyan Li, Xueying Wei, Jingxin Chen, Chengyuan Wang, Shuofeng Yuan [20'+5']

Presenter affiliation: The University of Hong Kong, Hong Kong, China. 51

Oxygen species-responsive tetrazine therapy

Luping Liu, Dongqing Ming, Dongxue Peng [10'+5']

Presenter affiliation: Institute of Materia Medica, CAMS & PUMC, Beijing, China. 52

Chemical biology of resistance-resistant antimicrobials

Xinxin Feng, Silei Bai, E Lei, Yu Zhou, Anming Yang, Junfeng Song
[10'+5']

Presenter affiliation: Hunan University, Changsha, Hunan, China. 53

Break

Exploring the immuno-regulatory roles of platinum-based anticancer drugs

Zijian Guo [20'+5']

Presenter affiliation: Nanjing University, Nanjing, China. 54

Photosensitizer-amplified antimicrobial materials for broad-spectrum ablation of resistant pathogens in ocular infections

Charles Lochenie, Sheelagh Duncan, Yanzi Zhou, Leonie Fingerhut, Alex Kiang, Sam Benson, Xiaogang Liu, Bethany Mills, Marc Vendrell
[10'+5']

Presenter affiliation: University of Edinburgh, Edinburgh, United Kingdom. 55

Harnessing biosynthesis for revolutionizing natural product research

Xiaoyu Tang [10'+5']

Presenter affiliation: Shenzhen Bay Laboratory, Shenzhen, China. 56

Development and potential of cholesterol-free, three-component G-LNPs for spleen-targeted mRNA delivery

Mao Li, He Zhang, Dejing Liu [10'+5']

Presenter affiliation: Shenzhen Bay Laboratory, Shen Zhen, China. 57

TXNRD1 drives innate immune response in senescent cells with implications in age-associated inflammation

Rugang Zhang [10'+5']

Presenter affiliation: The University of Texas MD Anderson Cancer Center, Houston, Texas. 58

THURSDAY, May 30—6:00 PM

COCKTAILS and BANQUET

SESSION 8 DRUG DISCOVERY II

Chairperson: **Giulio Superti-Furga**, Austrian Academy of Sciences, Vienna, Austria
Haian Fu, Emory University School of Medicine, Atlanta, Georgia, USA

Small molecule glues to restore disease mutation-perturbed protein-protein interactions in cancer

Haian Fu [20'+5']

Presenter affiliation: Emory University School of Medicine, Atlanta, Georgia.

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A carrier-free self-assembling nanodevice for promoting skin regeneration

Gus R. Rosania [20'+5']

Presenter affiliation: University of Michigan, Ann Arbor, Michigan.

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Unveiling structural and mechanical characteristics of site-specific PTM α -synuclein fibrils in Parkinson's disease

Yan-Mei Li [20'+5']

Presenter affiliation: Tsinghua University, Beijing, China.

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Enhanced selectivity in prostate cancer therapy via BET inhibition with self-immolating targeted epigenetic inhibitor

Cong Tang, Rui Traquete, Elizabeth Henderson, João Conde, Sara Picaud, Panagis Filippakopoulos, Gonçalo Bernardes [10'+5']

Presenter affiliation: Instituto de Medicina Molecular João Lobo Antunes, Lisbon, Portugal.

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A phosphoglycerate mutase 1 allosteric inhibitor restrains TAM-mediated colon cancer progression

Miaomiao Gong, Minghao Zhang, Ying Shen [10'+5']

Presenter affiliation: Shanghai Jiao Tong University School of Medicine, Shanghai, China.

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KEYNOTE SPEAKER

Development of small-molecule inhibitors and degraders to target protein-protein interactions

Shaomeng Wang [35'+10']

Presenter affiliation: University of Michigan, Ann Arbor, Michigan.

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