

Abstracts of papers presented
at the 2023 Cold Spring Harbor Asia Conference

IMMUNORECEPTOR SIGNALING AND THERAPEUTIC APPLICATIONS

November 6–November 10, 2023

Arranged by

Naoki Hosen, *Osaka University*

Enfu Hui, *University of California, San Diego*

Caroline Robert, *Gustave Roussy & Paris-Saclay University*

André Veillette, *Institut de Recherches Cliniques de Montréal*

Chenqi Xu, *Shanghai Institute of Biochemistry & Cell Biology, CAS*

Sho Yamasaki, *Osaka University*



Cold Spring Harbor Conferences Asia
Cold Spring Harbor Laboratory



IMMUNORECEPTOR SIGNALING AND THERAPEUTIC APPLICATIONS

Monday, November 6 – Friday, November 10, 2023

Monday	7:00 pm	Keynote Speaker
Monday	7:45 pm	1 Antigen Receptors I
Tuesday	9:00 am	2 Antigen Receptors II
Tuesday	2:00 pm	Poster Session
Tuesday	4:30 pm	<i>Chinese Tea and Beer Tasting</i>
Tuesday	7:00 pm	Keynote Speaker
Tuesday	7:45 pm	3 Antigen Receptors III
Wednesday	9:00 am	4 Immune Cell Therapy
Wednesday	2:00 pm	<i>Visit to Old Suzhou*</i>
Wednesday	7:00 pm	5 Costimulatory and Coinhibitory Receptors
Thursday	9:00 am	6 Immune Checkpoint Blockade Therapy
Thursday	2:00 pm	7 Modulation of Immunoreceptors by Other Receptor Pathways I
Thursday	5:30 pm	Cocktails and Banquet
Friday	9:00 am	8 Modulation of Immunoreceptors by Other Receptor Pathways 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 6:30pm

More information will be available at CSHA office

(Map at the end of this abstract book)

PROGRAM

MONDAY, November 6—7:00 PM

KEYNOTE SPEAKER

Immune organoids and combinations to advance our understanding of autoimmunity, vaccination and infection

Mark M. Davis [35'+10']

Presenter affiliation: Howard Hughes Medical Institute, Stanford University, California.

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MONDAY, November 6—7:45 PM

SESSION 1 ANTIGEN RECEPTORS I

Chairperson: **Chenqi Xu**, Shanghai Institute of Biochemistry and Cell Biology, CAS, Shanghai, China

THEMIS is a novel substrate and allosteric activator of SHP1, playing dual roles during T cell development

Gaofeng Fan [10'+5']

Presenter affiliation: ShanghaiTech University, Shanghai, China.

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**How T-cells recognize antigens in health and disease—
Perspectives from molecular imaging**

Johannes B. Huppa, Janett Göhring, René Platzter, Timo Peters, Angelika Plach, Venugopal Gudipati [20'+10']

Presenter affiliation: Medical University of Vienna, Vienna, Austria.

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SESSION 2 ANTIGEN RECEPTORS II

Chairperson: **Chenqi Xu**, Shanghai Institute of Biochemistry and Cell Biology, CAS, Shanghai, China

Electrostatic power in immunoreceptor signaling

Chenqi Xu [20'+10']

Presenter affiliation: Shanghai Institute of Biochemistry and Cell Biology, Shanghai, China.

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γδ T cell poly-specificity enables a broad and rapid cellular immune response in diverse physiological and pathological conditions

Jing Guo, Xun Zeng, Roshni Roy Chowdhury, Vamsee Mallajosyula, Jianming Xie, Megha Dubey, Yuanyuan Liu, Yu-ling Wei, Brad A. Palanski, Conghua Wang, Lingfeng Qiu, Elsa Sola, Mark M. Davis, Dylan Dodd, Yueh-hsiu Chien [20'+10']

Presenter affiliation: Stanford University School of Medicine, Stanford, California.

5

Structural and biochemical insights into the TCR and BCR signaling

Zhiwei Huang [20'+10']

Presenter affiliation: Harbin Institute of Technology, Harbin, China.

6

The mechanism of effective TCR-pMHC interaction determined by TCR-T cell bond lifetime and catch bond

Xiang Zhao [10'+5']

Presenter affiliation: Chinese Academy of Sciences, Shanghai, China.

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Break

Requirement for optimal BCR signal strength in efficient positive selection of germinal center (GC) B cells

Tomohiro Kurosaki, Yoshihiro Baba, Takeshi Inoue [20'+10']

Presenter affiliation: Osaka University, Osaka, Japan; RIKEN, Center For Integrative Medical Science, Japan.

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MHC II regulation of CD8+ T cell tolerance and implications in autoimmunity and cancer immunotherapy

Xiaojuan Zhou, Xian Jia, Zhe Huang, Wen-Hsien Liu, Guo Fu, Changchun Xiao [20'+10']

Presenter affiliation: Xiamen University, Xiamen, China; The Scripps Research Institute, La Jolla, California; Sanofi, Suzhou, China. 9

TUESDAY, November 7—2:00 PM

POSTER SESSION

Tuning CAR signaling with PD1-ITSM insertion

Kexin Cao, Chenqi Xu

Presenter affiliation: Chinese Academy of Sciences, Shanghai, China. 10

Chronic IFN-Is signaling promotes lipid peroxidation-driven terminal CD8+T cell exhaustion and curtails anti-PD-1 treatment efficacy

Weixin Chen, Jia Ming Nickolas Teo, Siu Wah Yau, Melody Yee-Man Wong, Guang Sheng Heidi Ling

Presenter affiliation: The University of Hong Kong, Hong Kong, China. 11

THEMIS is a substrate and allosteric activator of SHP1, playing dual roles during T cell development

Jiali Zhang, Zhenzhou Jiang, Jialing Chen, Li Chen, Yanchun Zhang, Mei Huang, Shengmiao Chen, Gaofeng Fan

Presenter affiliation: ShanghaiTech University, Shanghai, China. 12

Blockade of CD200R1-CD200 inhibitory checkpoint promotes phagocytosis by macrophages to improve anti-tumor immunity

Jiaxin Li, Zhaoyu Wang, Ming-Chao Zhong, Zhenghai Tang, Jin Qian, Xiaogan Qin, André Veillette

Presenter affiliation: Institut de Recherches Cliniques de Montréal (IRCM), Montréal, Canada; McGill University, Montréal, Canada. 13

The humoral-immuno-modulatory role of LDLR

Tao Liang, Keze Lu, Chenqi Xu

Presenter affiliation: Hangzhou Institute for Advanced Study, UCAS, Hangzhou, China. 14

Tumor-specific T cell and TCR decoding via photocatalytic proximity cell labeling (PhoXCELL)

Hongyu Liu, Shian Ouyang, Peng R. Chen, Jie P. Li

Presenter affiliation: Nanjing University, Nanjing, China; Peking University, Beijing, China; Shenzhen Bay Laboratory, Shenzhen, China.

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FBXO38 cooperate with USP7 to mediate PD-1 homeostasis

Xiwei Liu, Zuomiao Lin, Xiangbo Meng, Chenqi Xu

Presenter affiliation: State Key Laboratory of Molecular Biology, CAS Center for Excellence in Molecular Cell Science, Shanghai, China.

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Lipid-regulated phosphorylation hierarchy of the T cell receptor tyrosine motifs

Li Meng, Hua Li, Changting Li, Chun Chu, Haochen Yang, Kexin Cao, Xue Gao, Chengsong Yan, Omer Dushek, Haopeng Wang, Xiaoshan Shi, Chenqi Xu

Presenter affiliation: Chinese Academy of Sciences, University of Chinese Academy of Sciences, Shanghai, China.

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cholesterol and 7-hydroxycholesterol modulate TCR signaling by antagonistically shaping the membrane binding of cd3e

Zhengxu Ren, Hua Li, Chenqi Xu

Presenter affiliation: CAS Center for Excellence in Molecular Cell Science, Shanghai, China.

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Phase separation of chimeric antigen receptor promotes immunological synapse maturation and persistent cytotoxicity

Xinyi Xu, Haotian Chen, Xiaomin Xu, Haopeng Wang, Chenqi Xu

Presenter affiliation: CAS Center for Excellence in Molecular Cell Science, Shanghai, China.

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TUESDAY, November 7—4:30 PM

Chinese Tea and Beer Tasting

TUESDAY, November 7—7:00 PM

KEYNOTE SPEAKER

Unveiling the molecular basis of T cell malfunctions and co-inhibition using multi-omics approaches

Bernard Malissen, Anais Joachim, Fanghui Zhang, Yinming Liang, Romain Roncagalli, Guillaume Voisinne, Marie Malissen [35'+10']
Presenter affiliation: Centre d'Immunologie de Marseille-Luminy, Aix Marseille Université, INSERM, CNRS, Marseille, France.

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TUESDAY, November 7—7:45 PM

SESSION 3 ANTIGEN RECEPTORS III

Chairperson: Sho Yamasaki, Osaka University, Osaka, Japan

Catch bonds nonlinearly control CD8 cooperation to shape T cell receptor specificity

Rui Qin, Yong Zhang, Jiawei Shi, Peng Wu, Chenyi An, Zhenhai Li, Jizhong Lou, Weiwei Yin, Wei Chen [10'+5']
Presenter affiliation: Zhejiang University, Hangzhou, China.

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Deciphering clonotypic responses of human T cells against infection

Sho Yamasaki [20'+10']
Presenter affiliation: Osaka University, Suita, Japan.

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LCK-coreceptor association ensures TCR repertoire diversity and T cell lineage fidelity

Justin Boxuan Zhang, Priyanka Chaurasia, Stefan A. Schattgen, Zijian Huang, Claerwen M. Jones, Angela Nguyen, Daniel Thiele, Paul G. Thomas, Dene R. Littler, Jamie Rossjohn, Pirooz Zareie, Nicole L. La Gruta [20'+10']
Presenter affiliation: Monash University, Clayton, Australia.

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SESSION 4 IMMUNE CELL THERAPY

Chairperson: **Naoki Hosen**, Osaka University Graduate School of Medicine, Osaka, Japan

Identification of cancer-specific targets formed by post-translational changes in proteins and development of CAR-T cell therapies targeting them

Naoki Hosen [20'+10']

Presenter affiliation: Osaka University Graduate School of Medicine, Osaka, Japan.

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Small molecule gated T cells for next generation of immunotherapy

Hui-Shan Li [20'+10']

Presenter affiliation: Korea Advanced Institute of Science and Technology, Dajeon, South Korea.

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Using distinct CAR and TCR signal transduction molecules to enhance cellular immunotherapy

Nicholas R. Gascoigne [20'+10']

Presenter affiliation: Yong Loo Lin School of Medicine, National University of Singapore, Singapore.

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Engineering allogeneic T cells with immunosuppressant-resistant transgene for universal CAR-T therapy

Yixi Zhang, Hongyu Fang, Guocan Wang, Guangxun Yuan, Ruoyu Dong, Yajie Wang, Chun Zhou, Weiwei Yin, Haowen Xiao, Jie Sun, Xun Zeng [10'+5']

Presenter affiliation: Zhejiang University School of Medicine, Hangzhou, China.

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Break

Decoding the enigma of CAR tonic signaling in CAR-T therapy—From theory to clinical implications

Jian Chen, Shizhen Qiu, Wentao Li, Haopeng Wang [20'+10']

Presenter affiliation: ShanghaiTech University, Shanghai, China.

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IDR-induced CAR condensation improves the cytotoxicity of CAR-Ts against low-antigen cancers

Xinyan Zhang, Qian Xiao, Longhui Zeng, Fawzaan Hashmi, Elahe Kamali, Xiaolei Su [10'+5']

Presenter affiliation: Yale University, New Haven, Connecticut. 29

Learning from the TCR—Engineering the next generation of chimeric antigen receptors, TRuCs and CD3 CARs

Wolfgang W. Schamel [30'+10']

Presenter affiliation: Signaling Research Centers BIOSS and CIBSS, Freiburg, Germany. 30

WEDNESDAY, November 8—2:00 PM

Visit to Old Suzhou

WEDNESDAY, November 8—7:00 PM

SESSION 5 COSTIMULATORY AND COINHIBITORY RECEPTORS

Chairperson: **Enfu Hui**, University of California-San Diego, La Jolla, California, USA

Sustained CD28 costimulation regulates CD8 T cell differentiation

Etienne Humblin, Isabel Korpas, Jiahua Lu, Dan Filipescu, Verena van der Heide, Simon Goldstein, Abishek Vaidya, Alessandra Soares-Schanoski, Beatrice Casati, Myvizhi E. Selvan, Zeynep H. Gümüs, Andreas Wieland, Mauro Corrado, Leona Cohen-Gould, Emily Bernstein, Dirk Homann, Jerry Chipuk, Alice O. Kamphorst [20'+10']
Presenter affiliation: Icahn School of Medicine at Mount Sinai, New York, New York. 31

T cell signaling mediated or modulated by cis-interactions

Enfu Hui [20'+10']

Presenter affiliation: University of California San Diego, La Jolla, California. 32

Heterogeneous condensates of membrane receptors regulate T cell signaling

Hui Chen, Jizhong Lou [10'+5']

Presenter affiliation: University of Chinese Academy of Sciences, Beijing, China.

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Proximity proteomics reveals stimulation-dependent TIGIT phosphorylation and signalling at the T cell immune synapse

William H. Zammitt, Jonathan D. Worboys, Stuart A. Cain, Martin J. Humphries, Daniel M. Davis [10'+5']

Presenter affiliation: University of Manchester, Manchester, United Kingdom.

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Overcoming TrkA immunosuppression in melanoma sensitizes immunotherapy for durable memory T cell protection

Tao Yin, Guoping Wang, Liuyang Wang, Xiao-Fan Wang, Qi-Jing Li [20'+10']

Presenter affiliation: Duke University, Durham, North Carolina; Agency for Science, Technology and Research (A*STAR), Singapore.

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THURSDAY, November 9—9:00 AM

SESSION 6 IMMUNE CHECKPOINT BLOCKADE THERAPY

Chairperson: **André Veillette**, Montreal Clinical Research Institute (IRCM), Montreal, Canada

New strategies of antibody based fusion proteins for tumor immunity

Yang-Xin Fu [20'+10']

Presenter affiliation: Tsinghua University, Beijing, China.

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The inhibitory receptor KIR3DL1 modulates NK cell functions and controls HIV infection

Liang Shan [20'+10']

Presenter affiliation: Washington University in St. Louis, St. Louis, Missouri.

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Novel roles of SLAM family receptors and their regulators in macrophages

André Veillette, Zhenghai Tang, Jiaxin Li [20'+10']

Presenter affiliation: Montreal Clinical Research Institute (IRCM), Montreal, Canada.

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CD47 masks pro-phagocytic ligands in cis on tumor cells to suppress anti-tumor immunity

Zhenghai Tang, Ming-Chao Zhong, Jin Qian, Cristian Camilo Galindo, Dominique Davidson, Jiaxin Li, Yunlong Zhao, Enfu Hui, Andre Veillette [10'+5']

Presenter affiliation: Institut de Recherches Cliniques de Montréal (IRCM), Montréal, Québec, Canada.

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Break

Mechanism based approaches to improve the efficacy of immune checkpoint therapy

Feng Wang [10'+5']

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

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FcγR co-engagement by therapeutic antibodies targeting immune checkpoints cluster antigens at the immune synapse and correlates with increased T cell stimulation

Jonathan D. Worboys, Michael A. Conner, Peter Morley, David Jones, Andrew Sanderson, Jeremy D. Waight, Daniel M. Davis [10'+5']

Presenter affiliation: University of Manchester, Manchester, United Kingdom.

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Multiple layers of CD8⁺ T cell responders to PD-1/PD-L1 blockade

Lilin Ye [20'+10']

Presenter affiliation: Third Military Medical University of China, Chongqing, China.

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THURSDAY, November 9—2:00 PM

SESSION 7 MODULATION OF IMMUNORECEPTORS BY OTHER RECEPTOR PATHWAYS I

Chairperson: **Gloryn Chia**, National University of Singapore, Singapore

Nucleo-cytosolic acetyl-CoA drives tumor immune evasion by epigenetically regulating PD-L1 in melanoma

Weinan Guo, Huina Wang, Xiuli Yi, Lintao Jia, Chunying Li [10'+5']

Presenter affiliation: Xijing Hospital, Fourth Military Medical University, Xi'an, China.

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- β -lapachone treatment promotes tumor associated neutrophils (TANs) polarized towards anti-tumor (N1) phenotype**
 Soumya Tumbath, Lingxiang Jiang, Xiaoguang Li, Yang-Xin Fu, Xiumei Huang [10'+5']
 Presenter affiliation: Indiana University School of Medicine, Indianapolis, Indiana. 44
- Targeting tumor cells toward the antigenic specificity of bystander T cells in tumor microenvironment potentiates cancer immunotherapy**
Xiangyu Chen, Jing Zhao, Shuai Yue, Ziyu Li, Xiang Duan, Yao Lin, Yang Yang, Junjian He, Leiqiong Gao, Lifan Xu, Qizhao Huang, Yan Li, Fan Bai, Guozhong Zhang, Lilin Ye [10'+5']
 Presenter affiliation: Chongqing Medical University, Chongqing, China. 45
- Circular RNA as a source of neoantigens for cancer vaccines**
Gloryn Chia, Yi Ren, Thamizhanban Manoharan [10'+5']
 Presenter affiliation: National University of Singapore, Singapore. 46
- Neoantigen-related immune ecosystem and its clinical relevances of early-stage lung adenocarcinoma**
 Yulan Deng, Liang Xia, Jian Zhang, Lunxu Liu, Shensi Shen [10'+5']
 Presenter affiliation: Sichuan University, West China Hospital, Chengdu, China. 47
- Building a proteome-wide resource for protein sciences**
Tao Chen [20'+10']
 Presenter affiliation: Absea, Berlin, Germany. 48

THURSDAY, November 9—5:30 PM

COCKTAILS and BANQUET

SESSION 8 MODULATION OF IMMUNORECEPTORS BY OTHER RECEPTOR PATHWAYS II

Chairperson: **James Chou**, Shanghai institute of Organic Chemistry, CAS, Shanghai, China

TREM2 in neurodegeneration and cancer

Marco Colonna [20'+10']

Presenter affiliation: Washington University School of Medicine in St Louis, Saint Louis, Missouri.

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GSK3 regulation of regulatory T cells in tumor immune tolerance

Wen-Hsien Liu, Chenfeng Liu, Yuxuan Wang [10'+5']

Presenter affiliation: School of Life Sciences, Xiamen, China.

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An engineered probiotic produces a type III interferon IFNL1 and reduces inflammations in *in vitro* inflammatory bowel disease models

Koon Jiew Chua, Hua Ling, In Young Hwang, Hui Ling Lee, John C. March, Yung Seng Lee, Matthew Wook Chang [10'+5']

Presenter affiliation: National University of Singapore, Singapore.

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Cell volume regulated by LRRc8A-formed volume-regulated anion channels controls T cell activation

Ning Wu [10'+5']

Presenter affiliation: Huazhong University of Science and Technology, Wuhan, China.

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Stiffness induced phenotypical changes contribute to tumor associated dysregulation of dendritic cells

Carla Guenther [10'+5']

Presenter affiliation: Osaka University, Osaka, Japan.

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Revisiting the problem of receptor clustering

James J. Chou [20'+10']

Presenter affiliation: Shanghai Institute of Organic Chemistry, Chinese Academy of Science, Shanghai, China.

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