

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

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# FRONTIERS IN SINGLE CELL GENOMICS

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November 5–November 8, 2024

Arranged by

William Greenleaf, *Stanford University*

Muzlifah Haniffa, *Wellcome Sanger Institute*

ChungChau Hon, *RIKEN*

Shyam Prabhakar, *Genome Institute of Singapore*

Fuchou Tang, *Peking University*



Cold Spring Harbor Conferences Asia  
Cold Spring Harbor Laboratory



# FRONTIERS IN SINGLE CELL GENOMICS

Awaji, Japan

Tuesday, November 5 – Friday, November 8, 2024

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Tuesday	6:00 pm	<i>Dinner and Sake Barrel Breaking</i>
Tuesday	7:30 pm	<b>1</b> Keynote Session
Wednesday	9:00 am	<b>2</b> Spatial Omics
Wednesday	2:00 pm	<b>3</b> Single Cell Sequencing Technologies
Wednesday	7:00 pm	<b>Poster Session</b>
Thursday	9:00 am	<b>4</b> Building Organ Atlas
Thursday	2:00 pm	<b>5</b> Single Cell Immunology
Thursday	6:00 pm	<i>Cocktails and Banquet</i>
Friday	9:00 am	<b>6</b> Human Diseases

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Awaji Yumebutai Conference Center

Meeting venue: Main Hall, 2nd floor of the Conference Center  
Poster session: Reception Hall B Foyer, 2nd floor of Conference Center  
CSHA office: Room 202

Breakfast\*: Coccolare, 2nd floor of Grand Nikko Awaji  
Dinner: Reception Hall B, 2nd floor of Conference Center  
Lunch: Reception Hall B, 2nd floor of Conference Center  
Cocktails: Cielo, 1st floor of Grand Nikko Awaji  
Banquet: Stella, 1st floor of Grand Nikko Awaji

*\*Only available for guests staying at Grand Nikko Awaji*

## PROGRAM

TUESDAY, November 5—7:30 PM

### SESSION 1 KEYNOTE SESSION

**Chairperson:** **Shyam Prabhakar**, Genome Institute of Singapore, Singapore

#### **From single-cell atlases to decoding gene regulation**

Oliver Stegle [35'+10']

Presenter affiliation: EMBL & DKFZ, Heidelberg, Germany.

1

#### **Quantifying the physical genome in health and disease**

William J. Greenleaf [20'+10']

Presenter affiliation: Stanford University, Stanford, California.

2

#### **Integrative analysis of single-cell ATAC seq and single cell RNA Seq reveals radiation induced epigenetic regulation**

Jihang Yu, Shuxiong Wang, Huiqun Chen, Steve Pecoski, Shelby Boell, Peter Pfeiffer, Isabelle Gosselin, Monica Paterson, Mary-Anne Harris, Yi Wang [10'+5']

Presenter affiliation: Canadian Nuclear Laboratories, Chalk River, Canada; University of Ottawa, Ottawa, Canada.

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WEDNESDAY, November 6—9:00 AM

### SESSION 2 SPATIAL OMICS

**Chairperson:** **Chung Chau Hon**, RIKEN, Yokohama, Japan

#### **Spatial and single cell diversity of cells and humans**

Shyam Prabhakar [20'+10']

Presenter affiliation: ASTAR Genome Institute of Singapore, Singapore; Lee Kong Chian School of Medicine, Singapore; Cancer Science Institute of Singapore, Singapore.

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**Integrated spatial profiling of Immune checkpoint therapy predictors in lung cancer**

Geunseob Lee, Huiram Kang, Hae-Ock Lee [20'+10']

Presenter affiliation: The Catholic University of Korea, Seoul, South Korea.

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**A spatial multimodal atlas of whole human embryo**

Jimmy Tsz Hang Lee, Nana-Jane Chipampe, Vitalii Kleshchevnikov, Yeliz Demirci, Koen Rademaker, Emily Stephenson, Simone Webb, Antony Rose, Chuan Xu, Stanislaw Makarchuk, Tong Li, Kenny Roberts, Robert Petryszak, David Horsfall, Daniela Basurto-Lozada, Sarah A. Teichmann, Muzlifah Haniffa, Omer A. Bayraktar [10'+5']

Presenter affiliation: Wellcome Sanger Institute, Cambridge, United Kingdom.

6

**High-resolution, noninvasive single-cell lineage tracing in mice and humans based on DNA methylation epimutations**

Shou-Wen Wang [10'+5']

Presenter affiliation: Westlake University, Hang Zhou, China.

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**Break**

**PRISM—Multiplexed profiling of RNA in-situ through single-round of imaging in three-dimensional tissue**

Yanyi Huang [20'+10']

Presenter affiliation: Peking University, Beijing, China.

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**Mapping the rules of neurological disorders using single cell and spatial genomics**

Omer Ali Bayraktar [20'+10']

Presenter affiliation: Wellcome Sanger Institute, Hinxton, United Kingdom.

9

**Revealing cambium stem cell behaviour during secondary growth in *Arabidopsis thaliana* with snRNA-seq**

Jiao Zhao, Kiara Kaeufer, Hui Cao, Linus Lassen, Thomas Greb, Dongbo Shi [10'+5']

Presenter affiliation: Heidelberg University, Heidelberg, Germany; University of Potsdam, Potsdam, Germany; RIKEN, Yokohama, Japan.

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**Shared genetic vulnerabilities in human C9ORF72 ALS cortical neurons**

Mathieu Perez, Jimmy Lee, Jing Kwa, Fani Memi, Nikolaos Patikas, Oliver Gould, Lea Wenger, Alsu Missarova, Younbok Lee, Claire Troakes, Jemeen Sreedharan, Martin Hemberg, Andras Lakatos, Omer Bayraktar [10'+5']

Presenter affiliation: Wellcome Sanger Institute, Hinxton, United Kingdom.

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WEDNESDAY, November 6—2:00 PM

**SESSION 3 SINGLE CELL SEQUENCING TECHNOLOGIES**

**Chairperson:** Yanyi Huang, Peking University, Beijing, China

**Droplet Hi-C for fast and scalable profiling of chromatin architecture in single cells**

Lei Chang, Yang Xie, Brett Taylor, Zhaoning Wang, Jiachen Sun, Ethan Armand, Shreya Mishra, Jie Xu, Melodi Tastemel, Audrey Lie, Zane Gibbs, Tuyet R. Tan, Rafael Bejar, Clark C. Chen, Frank B. Furnari, Ming Hu, Bing Ren [20'+10']

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

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**Novel sequencing tools to explore translation in individual cells**

Alexander A. van Oudenaarden [20'+10']

Presenter affiliation: Hubrecht Institute, Utrecht, the Netherlands.

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**Three-dimensional genome structures of single mammalian sperm**

Dong Xing [20'+10']

Presenter affiliation: Peking University, Beijing, China.

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**Single cell co-assay of small molecule drug-genome engagement and epigenome for probing drug response**

Chao Dong, Xiaoxuan Meng, Tong Zhang, Zhifang Guo, Haiqing Xiong, Shaokun Shu, Aibin He [20'+10']

Presenter affiliation: Peking University, Beijing, China.

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**Break**

**New technologies and algorithmic experimental designs to study intracellular, intercellular, and functional transcriptional circuits**  
Brian Cleary [20'+10']  
Presenter affiliation: Boston University, Boston, Massachusetts. 16

**Single-cell omics sequencing technologies—The third generation**  
Fuchou Tang [20'+10']  
Presenter affiliation: Peking University, Beijing, China. 17

**UDA-seq—Universal droplet microfluidics-based combinatorial indexing for massive-scale multimodal single-cell sequencing**  
Yun Li, Zheng Huang, Lubin Xu, Qin Qiao, Jun Ping, Yanjie Chen, Guochao Li, Qifei Wang, Chengwei Yu, Shaokun Shu, Feng Zhang, Weiqi Zhang, Guang-Hui Liu, Limeng Chen, Lan Jiang [10'+5']  
Presenter affiliation: China National Center for Bioinformation, Beijing, China. 18

WEDNESDAY, November 6—7:00 PM

## POSTER SESSION

**Deep learning analysis of single-cells in histopathological images reveals cellular morphological changes with age across human tissues**  
Ernesto Abila, Iva Buljan, Yimin Zheng, André F. Rendeiro  
Presenter affiliation: CeMM Research Center for Molecular Medicine of the Austrian Academy of Sciences, Vienna, Austria. 19

**Comprehensive identification of transcriptionally active enhancers in the human genome through single-cell multi-omics**  
Na Ai, Hao Yu, Yun Li, Lan Jiang, Jiang Liu  
Presenter affiliation: Chinese Academy of Sciences (CAS), Beijing, China. 20

**Overview of the Human Cell Atlas**  
Yoshinari Ando  
Presenter affiliation: RIKEN, Yokohama, Japan; Human Cell Atlas, Yokohama, Japan. 21

**Gene count normalization in single-cell imaging-based spatially resolved transcriptomics**  
Lyla Atta, Kalen Clifton, Manjari Anant, Gohta Aihara, Jean Fan  
Presenter affiliation: Johns Hopkins University, Baltimore, Maryland. 22

<p><b>Increased levels of <math>\alpha</math>-1,2-mannosidase MAN1C1 in glioma stem cells influence immune modulation and prognostic outcomes in glioma patients</b>  <u>Don Carlo R. Batara</u>, Chan-Ho Lee, Hyun-Jin Kim, Minseo Kim, Hyun-soo Lee, Sung-Hak Kim  Presenter affiliation: Chonnam National University, Gwangju, South Korea.</p>	23
<p><b>Mastering the differences—Informational measurement in the era of scRNA-seq</b>  <u>Jinpu Cai</u>, Ziqi Rong, Luting Zhou, Hongyi Xin  Presenter affiliation: Shanghai Jiao Tong University, Shanghai, China.</p>	24
<p><b>Mechanistic insights into perihilar cholangiocarcinoma via single-cell analysis</b>  <u>Yanjie Chen</u>, Minyu Lin, Shuo Jin, Lan Jiang  Presenter affiliation: CAS Key Laboratory of Genome Sciences &amp; Information, Beijing, China; Beijing Institute of Genomics, Beijing, China.</p>	25
<p><b>Deciphering spinal cord injury across space and time using integrated single-cell and spatial transcriptomics</b>  <u>Yeliz Demirci</u>, Emily R. Burnside, Jovan Tanevski, Chang Lu, Zoi Katsirea, Kenny Roberts, Guillaume P. Heger, Jimmy Lee, Elizabeth Tuck, Julio Saez-Rodriguez, Frank Bradke, Omer A. Bayraktar  Presenter affiliation: Wellcome Sanger Institute, Cambridge, United Kingdom.</p>	26
<p><b>Interspecies organoids reveal human-specific molecular features of dopaminergic neuron development and vulnerability</b>  Sara Nolbrant, Jenelle Wallace, <u>Jingwen Ding</u>, Alex Pollen  Presenter affiliation: UCSF, San Francisco, California.</p>	27
<p><b>AUOT—Advanced spatial transcript omics aligner with Unbalanced Optimal Transport theory</b>  <u>Tiannan Feng</u>, Zehua Jing, Yinqi Bai  Presenter affiliation: University of Chinese Academy of Sciences, Beijing, China; BGI Research, Hangzhou, China.</p>	28
<p><b>The Mouse Lipid Brain Atlas</b>  <u>Luca Fusar Bassini</u>, Halima H. Schede, Gioele La Manno, Giovanni D'Angelo  Presenter affiliation: EPFL, Lausanne, Switzerland.</p>	29

**Unveiling clonal cell fate and differentiation dynamics—A hybrid NeuralODE-Gillespie approach**

Mingze Gao, Melania Barile, Shirom Chabra, Myriam Haltalli, Emily Calderbank, Yiming Chao, Elisa Laurenti, Bertie Gottgens, Yuanhua Huang

Presenter affiliation: School of Biomedical Sciences, HKSAR, Hong Kong, China.

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**Knockout of *DGKα* mediated by the novel Cas12a editing system enhances the functional activity of human TCR-T cells**

Qiang Guo, Lei Huang, Yi Liu, Qumiao Xu, Yue Zheng, Xuan Dong, Xun Xu

Presenter affiliation: University of Chinese Academy of Sciences, Beijing, China; BGI Research, Hangzhou, China; BGI Research, Shenzhen, China.

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**Adjusting local distances to infer better three-dimensional chromosome structures from single cell Hi-C data**

Yoshito Hirata, Yukiko Gotoh

Presenter affiliation: University of Tsukuba, Tsukuba, Japan.

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**Expressed nucleotide variation—A key driver of cellular heterogeneity**

Siera Martinez, Tushar Sharma, Vania Ballesteros Prieto, Hovhannes Arestakesyan, Zhe Yu, Anelia Horvath

Presenter affiliation: George Washington University, Washington, DC.

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**Modal-aware high-resolution cross-condition CITE-seq mosaic data integration with CITE-pool**

Xinzhu Jiang, Cheng Wang, Jinpu Cai, Bing He, Yu Zhao, Jianhua Yao, Yuxuan Hu, Jin Gu, Qiuyu Lian, Hongyi Xin

Presenter affiliation: Shanghai Jiao Tong University, Shanghai, China.

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**Spatially resolved molecular and cellular atlas of the mouse brain**

Lei Han, Zhen Liu, Zehua Jing, Yuxuan Liu, Huizhong Chang, Junjie Lei, Yujie Peng, Kexin Wang, Yuanfang Xu, Wei Liu, Zihan Wu, Jianhua Yao, Xun Xu, Longqi Liu, Zhiming Shen, Wu Wei, Yan-Gang Sun

Presenter affiliation: BGI Research, Hangzhou, China; University of Chinese Academy of Sciences, Beijing, China.

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**High-throughput single-molecule transcriptional start and end-site at single-cell resolution**

Chang N. Kim, Tomasz J. Nowakowski

Presenter affiliation: University of California San Francisco, San Francisco, California.

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**Single-nucleus transcriptome profiling of impaired root growth due to defective unfolded protein response in *Arabidopsis thaliana***

June-Sik Kim, Atsuko Hirota, Yasuko Watanabe, Makoto Hayashi, Keiichi Mochida

Presenter affiliation: RIKEN Center for Sustainable Resource Science, Yokohama, Japan; Institute of Plant Resource Science, Kurashiki, Japan.

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**Fine-tuned gene expression dynamics regulated by non-coding regions**

Naoki Kubo, Masahito Ikawa, Hiroyuki Sasaki, Bing Ren

Presenter affiliation: RIKEN BRC, Tsukuba, Japan.

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**Identification of new sarcopenia biomarkers through big data-based transcriptome analysis**

Jae Gyu Kim, Yeon-Hee Lee, Sang-Soo Lee

Presenter affiliation: Hallym University-Chuncheon Sacred Heart Hospital, Chuncheon-si, South Korea.

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**Decoding cellular interactions in functional skin regeneration—Insights from single-cell multi-omics**

Yueming Li, Xin Zhou, Yiheng Li, Weixing Zhang, Wen Zeng, Jin Xu

Presenter affiliation: Sun Yat-sen University, Guangzhou, China.

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**scNanoSeq-CUT&Tag—A single-cell long-read CUT&Tag sequencing method for efficient chromatin modification profiling within individual cells**

Qingqing Li, Yuqing Guo, Zixin Wu, Xueqiang Xu, Zhenhuan Jiang, Shuyue Qi, Zhenyu Liu, Lu Wen, Fuchou Tang

Presenter affiliation: School of Life Sciences, Biomedical Pioneering Innovation Center, Beijing, China; Beijing Advanced Innovation Center for Genomics (ICG), Beijing, China.

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<b>Ensembles of genome-coverage single-cell histone modifications reveal epigenetic lineages during mouse preimplantation development</b>	
<u>Min Liu</u> , Yanzhu Yue, Xubin Chen, Kexin Xian, Chao Dong, Shu Gao, Haiqing Xiong, Qiangfeng C. Zhang, Aibin He Presenter affiliation: College of Future Technology, Beijing, China.	42
<b>Comprehensive isoform-resolved mapping of the human blood atlas</b>	
<u>Danson Loi</u> , Ali Cenk Aksu, Jianfeng Sun, Adam P. Cribbs Presenter affiliation: University of Oxford, Oxford, United Kingdom.	43
<b>The epigenetic regulation of meiosis during mouse embryonic stage germ cell development</b>	
<u>Jiansen Lu</u> , Wen Li, Fuchou Tang Presenter affiliation: Peking University, Beijing, China.	44
<b>Systematic characterization of full-length RNA isoforms in human colorectal cancer at single-cell resolution</b>	
<u>Ping Lu</u> , Yu Zhang, Xin Zhou, Yueli Cui, Yuhan Liao, Zhenyu Liu, Zhi-Jie Cao, Jun'e Liu, Lu Wen, Wei Fu, Fuchou Tang Presenter affiliation: Peking University, Beijing, China.	45
<b>T cell single cell data analysis</b>	
<u>Yiqing Lv</u> , Haitao Li. Presenter affiliation: Tsinghua University, Beijing, China.	46
<b>Single-cell RNA-seq reveals soma-germline communication and Chinmo-mediated sex maintenance in the <i>Drosophila</i> testis</b>	
Rui Zhang, Peiyu Shi, Lin Zhu, Zhe Ming, Ningyi Shao, Jin Xu, <u>Qin Ma</u> Presenter affiliation: Shenzhen Institute of Advanced Technology, CAS, Shenzhen, China.	47
<b>A single-cell atlas of transcribed cis-regulatory elements in the human genome</b>	
<u>Jonathan Moody</u> , Piero Carninci, Jay W. Shin, Chung-Chau Hon Presenter affiliation: RIKEN, Yokohama, Japan.	48
<b>Genome-wide Cas9-mediated screening of essential non-coding regulatory elements via libraries of paired single-guide RNAs</b>	
Yufeng Li, Minkang Tan, Almira Akkari-Henic, Limin Zhang, Maarten Kip, Shengnan Sun, Jorian Sepers, Ningning Xu, Yavuz Ariyurek, Susan Kloet, Richard Davis, Harald Mikkers, Joshua Gruber, Michael Snyder, Xiao Li, <u>Baoxu Pang</u> Presenter affiliation: Leiden University Medical Center, Leiden, Netherlands.	49

<b>CellKb—A manually curated database of cell type markers for fast and accurate cell type annotation and biomarker discovery</b> <u>Ashwini Patil</u> , Ajay Patil Presenter affiliation: Combinatics K. K., Ichikawa-shi, Chiba, Japan.	50
<b>Heterogeneity effects of bisphenol A and its substitute, fluorene-9-bisphenol, on intestinal homeostasis</b> <u>Junxuan Peng</u> , Shengda Cao, Zhen Hu, Jiayi Zhu, Yi Zhu, Xiaole Sheng, Zuchao Cai, Rongpan Bai, Xushen Xiong, Jinghao Sheng Presenter affiliation: Zhejiang University, Hangzhou, China.	51
<b>Single-cell multi-region dissection of neurodegenerative proteinopathy spectrum disorders in the human brain</b> <u>Sebastian Pineda</u> , Hyeseung Lee, Francisco J. Garcia, Veronique V. Belzil, Manolis Kellis, Myriam Heiman Presenter affiliation: MIT, Cambridge, Massachusetts; Broad Institute of MIT and Harvard, Cambridge, Massachusetts.	52
<b>Multi-omics analysis reveals gene regulation underlying higher-order olfactory threat in the amygdala-piriform network</b> <u>Tian Qin</u> , Tayebah Sepahvand, Zia Hasan, Qi Yuan Presenter affiliation: Memorial University of Newfoundland, St. John's, Canada.	53
<b>Inferring multimodal single-cell feature signatures with topic modeling</b> <u>Piotr Rutkowski</u> , Marcin Tabaka Presenter affiliation: Polish Academy of Sciences, Warsaw, Poland.	54
<b>The influence of serotonin on the tCREs activity during hypothalamic development</b> <u>Marat Sabirov</u> , Anastasiia Gainullina, Evgeniia Chikina, Viktoria Melnikova, Elena Shagimardanova, Oleg Gusev, Roman Romanov Presenter affiliation: Life Improvement by Future Technologies Center, Moscow, Russia; Koltzov Institute of Developmental Biology RAS, Moscow, Russia.	55
<b>Uncertainty-aware phenotypic cell state identification via weakly supervised learning</b> <u>Bihan Shen</u> , Xufeng Chen, Huicheng Ye, Hong Li Presenter affiliation: Shanghai Institute of Nutrition and Health, Shanghai, China.	56

**Simultaneous profiles single-cell total RNA and accessible chromatin with split-pool barcoding**

Yuhuan Tao, Qing Zhan, Kairui Hu, Ge Wange, Zhi J. Lu

Presenter affiliation: Tsinghua University, Beijing, China.

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**Ab-GAM—A single-cell multimodal approach to explore the contribution of proteins or PTMs to 3D genome folding and cell state transitions**

Andréa Willemin, Christoph J. Thieme, Alexander Kukalev, Sergej Herzog, Thomas M. Sparks, Lavanya M. Iyer, Rieke Kempfer, Anja Schütz, Ana Pombo

Presenter affiliation: Max-Delbrück-Center for Molecular Medicine in the Helmholtz Association (MDC), Berlin, Germany; Humboldt-Universität zu Berlin, Berlin, Germany.

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**GLP: Redefining the high variable genes by robust LOESS regression with positive ratio**

Yue Xie, Zehua Jing, Hailin Pan, Yinqi Bai

Presenter affiliation: University of Chinese Academy of Sciences, Beijing, China; BGI Research, Hangzhou, Hangzhou, China; BGI Research, Shenzhen, China.

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**Regulatory mechanisms orchestrating cellular diversity of Cd36+ olfactory sensory neurons revealed by scRNA-seq and scATAC-seq analysis**

Jiawen Yang, Peiyu Shi, Jin Xu

Presenter affiliation: Sun Yat-Sen University, Guangzhou, China.

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**Deciphering peripheral immunity in human cohorts with autoimmune-related nephropathies**

Chengwei Yu, Yangqing Xu, Yun Li, Ping Li, Lan Jiang

Presenter affiliation: China National Center for Bioinformation, Beijing, China; Beijing Institute of Genomics, Chinese Academy of Sciences, Beijing, China; University of Chinese Academy of Sciences, Beijing, China.

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**Single-cell RNA sequencing analysis of gamma-irradiated human peripheral blood mononuclear cells (PBMCs)**

Jihang Yu, Shuxiong Wang, Huiqun Chen, Steve Pecoskie, Shelby Boell, Peter Pfeiffer, Isabelle Gosselin, Monica Paterson, Mary-Anne Harris, Yi Wang

Presenter affiliation: Canadian Nuclear Laboratories, Chalk River, Canada.

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**Exploring the role of tumor-specific T Cells in resistance to anti-PD-L1 immunotherapy in hepatocellular carcinoma**

Yan Zhang, Grace Fu-Wan Sit, Jacinth Wing-Sum Cheu, Haijing Deng, Cindy Xinqi Liu, Yiling Chen, Zher Yee Ooi, Vincent Wai-Hin Yuen, Chun-Ming Wong, Carmen Chak-Lui Wong  
Presenter affiliation: University of Hong Kong, Hong Kong, China; Hong Kong Science Park, Hong Kong, China.

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**Cigarette smoking causes somatic mutations in cardiac endothelial cells**

Zinan Zhou, August Yue Huang, Shulin Mao, Nazia Hilal, Brian Chhouk, Christopher A. Walsh, Eunjung Alice Lee, Ming-Hui Chen, Sangita Choudhury  
Presenter affiliation: Boston Children's Hospital, Boston, Massachusetts; Harvard Medical School, Boston, Massachusetts.

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**Multiome single cell analysis of epigenetically imprinted signalling cascades driving adult neurogenesis**

Katharina Zirngibl, Santiago Cerrizuala, Simon Anders, Ana Martin-Villalba  
Presenter affiliation: University of Heidelberg, Heidelberg, Germany.

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THURSDAY, November 7—9:00 AM

**SESSION 4 BUILDING ORGAN ATLAS**

**Chairperson:** **Dong Xing**, Peking University, Beijing, China

**Mapping and modeling the vertebrate regulatory sequence landscape at single-cell level**

Guoji Guo [20'+10']  
Presenter affiliation: Center for Stem Cell and Regenerative Medicine, Hangzhou, China.

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**A single-cell atlas of transcribed cis-regulatory elements in the human genome**

Jonathan Moody, Yoshinari Ando, Ikuko Koya, Piero Carninci, Jay Shin, Chung-Chau Hon [20'+10']  
Presenter affiliation: RIKEN, Yokohama, Japan.

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**Single-cell full-length nascent RNA sequencing unveils RNA dynamics in allele-, isoform-, and strand-specific manner**  
Jun'e Liu, Zonggui Chen, Yan Wang, Fuchou Tang [10'+5']  
Presenter affiliation: Peking University, Beijing, China. 68

**Decoding transcription factors' activity landscapes from single-cell multi-omics by sequence-informed deep learning**  
Fangxin Cai, Yuanhua Huang [10'+5']  
Presenter affiliation: University of Hong Kong, Hong Kong, China. 69

***Break***

**Toward a human brain single-cell epigenomic atlas**  
Joseph R. Ecker [20'+10']  
Presenter affiliation: Howard Hughes Medical Institute and Salk Institute for Biological Studies, La Jolla, California. 70

**Unraveling the developmental dynamics of genome architecture through single-cell DNA replication profiling**  
Ichiro Hiratani [20'+10']  
Presenter affiliation: RIKEN Center for Biosystems Dynamics Research (BDR), Kobe, Japan. 71

**Single-cell spatial omics analysis to develop precision cardiovascular medicine**  
Seitaro Nomura [10'+5']  
Presenter affiliation: The University of Tokyo, Tokyo, Japan. 72

**Generative machine learning to model cellular perturbations**  
Mo Lotfollahi [20'+10']  
Presenter affiliation: Wellcome Sanger Institute, Cambridge, United Kingdom. 73

**SESSION 5** SINGLE CELL IMMUNOLOGY

**Chairperson:** **Guoji Guo**, Zhejiang University School of Medicine, Hangzhou, China

**Modeling longitudinal pro-inflammatory networks with single-cell resolution communication analysis**

Aaron J. Wilk, Susan Holmes, Julie O. Overbaugh, Alex K. Shalek, Catherine A. Blish [20'+10']

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

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**Understanding immune responses with single-cell technologies**

Jianbin Wang [20'+10']

Presenter affiliation: Tsinghua University, Beijing, China.

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**Deciphering the Achilles heel of cancer immunotherapy through the lenses of single-cell genomics**

Alexandra-Chloé Villani [20'+10']

Presenter affiliation: Massachusetts General Hospital, Boston, Massachusetts; Broad Institute of Massachusetts Institute of Technology and Harvard, Cambridge, Massachusetts; Harvard Medical School, Boston, Massachusetts.

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**Benchmarking copy number aberrations inference tools using single-cell multi-omics datasets**

Liye Zhang, Minfang Song, Shuai Ma [10'+5']

Presenter affiliation: ShanghaiTech University, Shanghai, China.

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**A multi-omic atlas of human embryonic skeletal development**

Ken To, Lijiang Fei, J. Patrick Pett, Kenny Roberts, Raphael Blain, Krzysztof Polanski, Tong Li, Nadav Yaron, Peng He, Chuan Xu, James Cranley, Kerstin B. Meyer, Muzlifah A. Haniffa, Roger A. Barker, Omer A. Bayraktar, Alain Chedotal, Christopher D. Buckley, Sarah A. Teichmann [10'+5']

Presenter affiliation: Wellcome Sanger Institute, Hinxton, United Kingdom.

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**Break**

**A longitudinal single-cell atlas of anti-tumour necrosis factor treatment in inflammatory bowel disease**

Calliope A. Dendrou, Tom Thomas, Matthias Friedrich, Charlotte Rich-Griffin, Mathilde Pohin, Devika Agarwal, Julia Pakpoor, Carl Lee, Ruchi Tandon, Fiona M. Powrie, Simon Travis, Holm H. Uhlig, Christopher D. Buckley [20'+10']

Presenter affiliation: University of Oxford, Oxford, United Kingdom. 79

**An atlas of transcribed enhancers across human helper T cell diversity for decoding immune-mediated diseases**

Yasuhiro Murakawa [20'+10']

Presenter affiliation: RIKEN, Yokohama, Japan; Kyoto University, Kyoto, Japan. 80

**Somatic mutations in single neurons from *C9ORF72* amyotrophic lateral sclerosis and frontotemporal dementia brains reveal genome breakage**

Zinan Zhou, Lovelace J. Luquette, Guanlan Dong, Junho Kim, Jayoung Ku, Kisong Kim, Mingyun Bae, Diane Shao, Bezawit Sahile, Michael B. Miller, August Yue Huang, Peter J. Park, Clotilde Lagier-Tourenne, Eunjung Alice Lee, Christopher A. Walsh [10'+5']

Presenter affiliation: Boston Children's Hospital, Boston, Massachusetts; Harvard Medical School, Boston, Massachusetts. 81

THURSDAY, November 7—6:00 PM

**COCKTAILS and BANQUET**

FRIDAY, November 8—9:00 AM

**SESSION 6** HUMAN DISEASES

**Chairperson:** **William Greenleaf**, Stanford University, Stanford, California, USA

**Visualization of 2D and 3D spatial single-cell data with Vitesse**

Nils Gehlenborg [20'+10']

Presenter affiliation: Harvard Medical School, Boston, Massachusetts. 82



**Associating cancer and stromal genomes with transcriptomes by high-throughput single-nucleus multiomic sequencing**

Siran Li, Jude Kendall, Joan Alexander, Dan Levy, Michael Wigler [10'+5']

Presenter affiliation: Cold Spring Harbor Laboratory, Cold Spring Harbor, New York.

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**Single-cell transcriptomic characterization of Trastuzumab-treated Stk11<sup>-/-</sup>/NIC mouse model of breast cancer**

Paola A. Marignani, Ryan Holloway, Jinhong Kim [10'+5']

Presenter affiliation: Dalhousie University, Halifax, Canada.

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**Break**

**Elucidation of cellular and molecular architecture of giant cell arteritis**

Nobumasa Watanabe, Yuichiro Hara, Yasumasa Nishito, Mai Kounoe, Kazunari Sekiyama, Eisuke Takamasu, Takayasu Kise, Naofumi Chinen, Kota Shimada, Makoto Sugihara, Hideya Kawaji [20'+10']

Presenter affiliation: Tokyo Metropolitan Institute of Medical Science, Tokyo, Japan.

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**Population-scale single-cell RNA-seq across Asian countries reveals Asian-specific genetic architecture of alternative splicing and complex disease**

Chi Tian, Yuntian Zhang, Yihan Tong, Shyam Prabhakar, Boxiang Liu [20'+10']

Presenter affiliation: National University of Singapore, Singapore.

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**Single-cell triple-omics shows that DNA methylation underlies stemness of astrocytes in the healthy and ischemic adult brain**

Lukas P. Kremer, Santiago Cerrizuala, Ana Martin-Villalba, Simon Anders [10'+5']

Presenter affiliation: University of Heidelberg, Heidelberg, Germany; German Cancer Research Center, Heidelberg, Germany.

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