

Abstracts of papers presented
at the 2025 Cold Spring Harbor Asia Conference

HUMAN DEVELOPMENT: FROM EMBRYOS TO STEM CELL MODELS

September 22–September 26, 2025

Arranged by

Cantas Alev, *Kyoto University*

Bernadette de Bakker, *Amsterdam UMC*

Anne Grapin-Botton, *Max Planck Institute of Molecular Cell Biology
and Genetics*

Guojun Sheng, *Kumamoto University*

Hongmei Wang, *Chinese Academy of Sciences*



Cold Spring Harbor Conferences Asia
Cold Spring Harbor Laboratory



HUMAN DEVELOPMENT: FROM EMBRYOS TO STEM CELL MODELS

Monday, September 22 – Friday, September 26, 2025

Monday	7:00 pm	• Keynote Speaker I Session 1
Tuesday	9:00 am	Session 2
Tuesday	2:00 pm	Poster Session
Tuesday	7:00 pm	Session 3
Wednesday	9:00 am	• Keynote Speaker II Oral Session 4
Wednesday	1:30 pm	<i>Visit to Old Suzhou*</i>
Wednesday	7:00 pm	Session 5
Thursday	9:00 am	Session 6
Thursday	2:00 pm	Session 7: Ethics and Publishing Roundtable
Thursday	4:00 pm	<i>Cocktails and Banquet</i>
Friday	9:00 am	Session 8

Oral presentation sessions are located in the CSHA Auditorium

Poster session is in the Lake Front Hall.

Cocktails and Banquet is in a Restaurant in Old Suzhou

Restaurant Name: Pan Pacific Suzhou

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

More information will be available at CSHA office.

(Map at the end of this abstract book)

PROGRAM

MONDAY, September 22—7:00 PM

KEYNOTE SPEAKER

Introduction by: Guojun Sheng, Kumamoto University, Kumamoto, Japan

Graham J. Burton [30'+10']
University of Cambridge, Cambridge, United Kingdom.

**Stimulating human development—The post-implantation
intrauterine environment** 1

MONDAY, September 22—7:45 PM

SESSION 1

Chairperson: **Anne Grapin-Botton**, Max Planck Institute of Molecular
Cell Biology and Genetics, Dresden, Germany

How to build a primate—Modelling embryogenesis in a dish
Thorsten Edwin Boroviak.
Presenter affiliation: University of Cambridge, Cambridge, United
Kingdom. 2

Tridimensional analysis of human development
Alain Chedotal [20'+10']
Presenter affiliation: Institut de la Vision, Paris, France; Lyon 1
University, Lyon, France; Lyon Hospitals, Lyon, France. 3

**Epigenetic and transcriptional regulation of human lineage
specification in blastoids**
Antar Drews, Viktoria Lavro, Anne Wenzel, Karlien Van Nerum, Yan
Fung Wong, Joshua M. Brickman, Jan J. Zyllicz [15'+5']
Presenter affiliation: University of Copenhagen, Copenhagen,
Denmark. 4

SESSION 2

Chairpersons: **Stefan Liebau**, University of Tübingen,
Tübingen, Germany
Jose Silva, Guangzhou National Laboratory,
Guangzhou, China

Naïve and primed endoderm—Transcription factor occupancy driving plasticity and differentiation.

Josh M. Brickman [20'+10']

Presenter affiliation: University of Copenhagen, Copenhagen, Denmark.

5

Developmental insights into hepatoblastoma governed by hepatoblast progenitors

Peng Du [20'+10']

Presenter affiliation: Peking University, Beijing, China.

6

Break

Engineering pancreas organoids to study pancreas development and disease

Anne Grapin-Botton [20'+10']

Presenter affiliation: Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany.

7

Reconstructing the human distal airway—An organoid platform for studying pulmonary development and disease

Mu He [15'+5']

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

8

Chromatin-bound Mtf2 represses totipotency in naïve pluripotency

Seong-Min Kim, Sohyun Lim, Seong-Kyun Lim, Yeon-Joon Chu, Jiwon Bu, Young-Woo Won, Keun-Tae Kim, Hanbyeol Kim, Cantas Alev, Murim Choi, Chul-Hwan Lee, Hyuk-Jin Cha [15'+5']

Presenter affiliation: Seoul National University, Seoul, South Korea; Kyoto University, Kyoto, Japan.

9

POSTER SESSION

High transferrin receptor 1 expression determines unique O_xPHOS metabolism in naïve pluripotency

Yeon-Joon Chu, Hyuk-Jin Cha

Presenter affiliation: Seoul National University, Seoul, South Korea. 10

Early cell fate emerges through transcription factor-driven expression uncoupling, revealed by gene regulatory network inference and oscillation modeling

Ruslan Deviatiiarov, Ilia Rubinshtein, Mislimat Tagirova, Aryuna Tsyrenzhapova, Sheng Guojun, Oleg Gusev

Presenter affiliation: Ufa Federal Research Centre of Russian Academy of Sciences, Ufa, Russia; Life Improvement by Future Technologies (LIFT) Center, Moscow, Russia; Juntendo University, Tokyo, Japan. 11

Embryonic durotaxis and its role in cesarean scar pregnancy pathogenesis

Jing Du

Presenter affiliation: Beihang University, Beijing, China. 12

Innovative in vitro imaging approach for postmortem human fetal development using 3D-US and micro-CT

Wenjing Gou, Melek Rousian, Harsha Shah, Rene Wijnen, Bernadette de Bakker

Presenter affiliation: Amsterdam UMC, University of Amsterdam, Amsterdam, the Netherlands; Amsterdam Reproduction and Development Research Institute, Amsterdam, the Netherlands; Erasmus MC – Sophia Children's Hospital, Rotterdam, the Netherlands. 13

Sexual dimorphism in gonadal development underlies male-biased infertility in Down syndrome

Rui Gao, Wei Li, Zhenxiang Guo, Shijun Shen, Xiaocui Li, Cizhong Jiang, Jiayu Chen, Shaorong Gao

Presenter affiliation: Tongji University, Shanghai, China. 14

Comparative analysis of human and non-human primate (NHP) axial development <u>Sofiane Hamidi</u> , Yi Zhang, Sirajam Munira, Rolf T. Eriksson, Qui Viet Le, Mensura F. Cosar, Seongmin Kim, Jiwon Bu, Mert Akgunduz, Keuntae Kim, Gil D. Bregieiro Carraco, Amel Nasri, Cantas Alev Presenter affiliation: Kyoto University, Kyoto, Japan.	15
Development of a chicken embryo-based <i>in vivo</i> system to study human iPS cell differentiation into lateral plate mesoderm derivatives Galym Ismagulov, Zhe Wang, Sofiane Hamidi, Guojun Sheng Presenter affiliation: Kumamoto University, Kumamoto, Japan.	16
Efficient generation of human airway organoids from pluripotent stem-cell via isolated epithelial progenitors <u>Yan Li</u> , Mu He, Jiayi Zheng Presenter affiliation: The University of Hong Kong, Hong Kong, China.	17
METTL3-dependent m⁶A RNA methylation regulates transposable elements and represses human naïve pluripotency through transposable element-derived enhancers Weiyu Zhang, Haifeng Fu, Yuning Huang, Ming Zeng, <u>Xiangyu Quyang</u> , Pentao Liu, Lei Li, Jianqiao Liu Presenter affiliation: Stem Cell & Regenerative Medicine Consortium, Hong Kong, China.	18
Synthetic human tissue design—Tuning axial progenitors to make the human backbone <u>Tiago Rito</u> Presenter affiliation: HKU, Hong Kong, China.	19
Modeling human blastocyst-endometrium interaction using human stem cell-based embryo models and patient-derived endometrial organoids Ismail M. Shakir, Aisha Siddique, Islam M. Saadeldin, Mo Li Presenter affiliation: Bioscience Program, BESE Division, Thuwal, Saudi Arabia; KAUST Center of Excellence for Smart Health, Thuwal, Saudi Arabia.	20
Insights into transposable elements—Implications for reproductive health <u>Hongyu Song</u> , Yuqian Wang, Liying Yan, Peng Yuan Presenter affiliation: State Key Laboratory of Female Fertility Promotion, Center for Reproductive Medicine, Beijing, China.	21

Gm11545 plays a crucial role in regulating the lineage specification in pre-implantation mouse embryos

Jaeho Song, Seung Jae Lee, Gwidong Han, Seung Pyo Hong, Chunghee Cho

Presenter affiliation: School of Life Sciences, Gwangju Institute of Science and Technology, Gwangju, South Korea.

22

The DNA methylation clock during human placental development

Shanru Yi, Jing Xiao, Ruixue Wang, Mengting Wang, Jiayu Chen, Shaorong Gao

Presenter affiliation: Tongji University, Shanghai, China.

23

Pleiotropic roles of pro-inflammatory cytokines in regulating early-stage airway development

Shuxin Xiao, Jiayi Zheng, Yan Li, Mu He

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

24

Decoding allelic and lineage-specific DNA methylation patterns in early human embryos

Fanqing Xu, Qian Liu, Liying Yan, Jie Qiao, Peng Yuan.

Presenter affiliation: Peking University Third Hospital, Center for Reproductive Medicine, Beijing, China.

25

High resolution spatial transcriptomic profiling of human upper airway

Jiayi Zheng, Mu He

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

26

Proteomic dynamics of human oocyte maturation and preimplantation development

Wencheng Zhu, Zhen Liu

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

27

SESSION 3

Chairperson: **Cantas Alev**, Kyoto University, Kyoto, Japan

Fibroblast growth factors and ERK signaling in human gastrulation

Zong-Yuan Liu, Kyoung Jo, Gauri Patel, Zhiyuan Yu, LiAng Yao, Seth Teague, Craig Johnson, Jason Spence, Idse Heemskerk [20'+10']

Presenter affiliation: University of Michigan, Ann Arbor, Michigan. 28

Recreating embryo development in the lab using embryo founder-like cells

Jose C. Silva [20'+10']

Presenter affiliation: Guangzhou National Laboratory, Guangzhou, China. 29

Break

Embryo 3D reconstruction and embryo models—Get a glimpse of the human gastrulation

Legian Yu [20'+10']

Presenter affiliation: Institute of Zoology, Chinese Academy of Sciences, Beijing, China. 30

Emergence of embryo-like organization upon artificial input to hPSC epithelium

Zhe Wang, Galym Ismagulov, Junyao Zhang, Ruolin Hao, Masatoshi Ohgushi, Guojun Sheng, Mototsugu Eiraku [15'+5']

Presenter affiliation: Kyoto University, Kyoto, Japan. 31

New approaches to study the regulators of human trophoblast development

Irene Zorzan, Zicong Li, Christopher Penfold, Alexandra Pokhilko, Simon Andrews, Hendrik Marks, Peter Rugg-Gunn [15'+5']

Presenter affiliation: The Babraham Institute, Cambridge, United Kingdom. 32

WEDNESDAY, September 24—9:00 AM

KEYNOTE SPEAKER

Introduction by: Bernadette de Bakker, Amsterdam UMC, Amsterdam, the Netherlands

Jie Qiao [30'+10']
Peking University, Beijing, China

“From single-cell atlas to life’s blueprint—Analysis of reproductive development and the anticipation of ‘emergence’ empowered by AI”

33

WEDNESDAY, September 24—9:45 AM

SESSION 4

Chairpersons: **Tiago Rito**, The University of Hong Kong, Hong Kong, China
Yasuhiro Takashima, Kyoto University, Kyoto, Japan

Defining milestones of trophectoderm fate progression and naïve-to-primed pluripotency transition in human embryos reveals stage-match of human blastoids

Laurent David [20'+10']

Presenter affiliation: Nantes Université, Nantes, France.

34

Optimizing the cellular building blocks for human embryo and placenta models

Thorold W. Theunissen [20'+10']

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

35

Break

Investigating maternal-fetal interactions in human placentation using organoids

Elisa Magistrati, Sabine Reither, Hans-Rudolf Hotz, Tim-Oliver Buchholz, Jan Eglinger, Karolina Guja-Jarosz, Lhéanna Klaeylé, Margherita Y. Turco [20'+10']

Presenter affiliation: Friedrich Miescher Institute for Biomedical Research (FMI), Basel, Switzerland.

36

Usage of chicken CAGE atlas as a model for histone variants that play important roles in early human development

Ilya Rubinshteyn, Ruslan Deviatiiarov, Oleg Gusev, Guojun Sheng [15'+5']

Presenter affiliation: Ufa Federal Research Centre of Russian Academy of Sciences, Ufa, Russia.

37

WEDNESDAY, September 24—1:30 PM

Visit to Old Suzhou

WEDNESDAY, September 24—7:00 PM

SESSION 5

Chairpersons: **Lizhong Liu**, Westlake University, Hangzhou, China
Yixuan Wang, Tongji University, Shanghai, China

Dissecting primate embryonic development with multi-omics and embryo modes

Zhen Liu [20'+10']

Presenter affiliation: Center for Excellence in Brain Science and Intelligence Technology, Chinese Academy of Sciences, Shanghai, China.

38

Dynamic heterogeneity in developmental potential of peri-implantation extraembryonic lineages

Yiying Yu, Ziyi Li, Fan Zhou [15'+5']

Presenter affiliation: Tsinghua University, Beijing, China.

39

Break

New cellular models to study early human development

Peter Rugg-Gunn [20'+10']

Presenter affiliation: Babraham Institute, Cambridge, United Kingdom.

40

Towards in vitro reconstitution of human and non-human primate early embryonic development

Cantas Alev [20'+10']

Presenter affiliation: Kyoto University, Kyoto, Japan.

41

SESSION 6

Chairpersons: **Peter Mombaerts**, Max Planck Research Unit for Neurogenetics, Frankfurt, Germany
Mu He, The University of Hong Kong, Hong Kong, China

Building human embryo models to unlock blood niches for regenerative medicine

Mo Ebrahimkhani [20'+10']

Presenter affiliation: University of Pittsburgh, Pittsburgh, Pennsylvania. 42

The Dutch Fetal Biobank—A 3D window into human development

Bernadette S. de Bakker [20'+10']

Presenter affiliation: Amsterdam UMC, University of Amsterdam, Amsterdam, the Netherlands; AR&D, Amsterdam, the Netherlands; Erasmus MC – Sophia Children's Hospital, University Medical Center Rotterdam, Rotterdam, the Netherlands. 43

Break

Human retinal organoids in developmental biology and application

Stefan Liebau [15'+5']

Presenter affiliation: University of Tuebingen, Tuebingen, Germany. 44

Combinatorial profiling of multiple histone modifications and transcriptome in single cells using scMTR-seq

Yang Wang, Jingyu Li, Andrew Malcolm, William Mansfield, Stephen Clark, Ricard Argelaguet, Laura Biggins, Richard Acton, Simon Andrews, Wolf Reik, Gavin Kelsey, Peter Rugg-Gunn [15'+5']

Presenter affiliation: Babraham Institute, Cambridge, United Kingdom. 45

Differential response to SHH signalling in the developing neural tube and somites

Madeleine Demuth, Tiago Rito, Hilary Knowles, Isabel Zhang, James Briscoe [15'+5']

Presenter affiliation: The Francis Crick Institute, London, United Kingdom. 46

THURSDAY, September 25—2:00 PM

SESSION 7 ETHICS AND PUBLISHING

Chairpersons: **Anne Grapin-Botton**, Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany
Alex Eve, The Company of Biologists, Histon, United Kingdom

Human embryo model research—Challenges during a regulatory transition

Misao Fujita [20'+10']

Presenter affiliation: Kyoto University, Kyoto, Japan.

47

Robert Stephenson (Nature; Nature Communications)

Jiaying Tan (Cell)

Alex Eve (Development)

Anne Grapin-Botton (Stem Cell Reports)

ROUNDTABLE and Q&A

THURSDAY, September 25—4:00 PM

COCKTAILS and BANQUET

at Pan Pacific Suzhou in Old Suzhou

FRIDAY, September 26—9:00 AM

SESSION 8

Chairpersons: **Zhe Wang**, Kyoto University, Kyoto, Japan
Sofiane Hamidi, Kyoto University, Kyoto, Japan

Human embryonic development research using the Kyoto collection—Unlocking human-specific developmental mechanisms

Shigehito Yamada, Tomohisa Makino [20'+10']

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

48

Extraembryonic tissue development in amniote vertebrates

Guojun Sheng

Presenter affiliation: Kumamoto University, Kumamoto, Japan.

49

A spatiotemporal atlas of human organogenesis reveals molecular logic of tissue patterning and morphogenesis

Lizhong Liu [15'+5']

Presenter affiliation: Westlake University, Hangzhou, China.

50

3D human blastoid/blastocyst-endometrial assembloid co-culture recapitulates reciprocal adaptive maternal-fetal interface dynamics

Yan Bi, Zhifen Tu, Xinbao Zhang, Shaorong Gao, Yixuan Wang [15'+5']

Presenter affiliation: Tongji University, Shanghai, China.

51