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32nd TMIMS International Symposium

Ployploidy in Evolution, Development, and Disease

Date
2026 10.13 (Tue) - 15 (Thu)





Polyploid Cell Cycles in Development and Disease

Brian R Calvi

Department of Biology, Indiana University, USA



How to Capture Cells Undergoing Asynthetic Fission- and Where to Find Them

Chen-Hui Chen

Institute of Cellular and Organismic Biology, Academia Sinica, Taiwan



Non-canonical mechanisms of tetraploidy-mediated tumorigenesis : the case of size and stromal cell composition

Daniela Cimini

Department of Biological Sciences, Virginia Tech, USA



Tetraploid neurons in the normal and pathological mammalian brain

Jose M. Frade

Department of Molecular and Cellular Neuroscience, Cajal Neuroscience Center, Spain



Tipping the mitotic switch : how the CDK1-Greatwall-PP2A-B55 α balance sets the route to polyploidy and cell death

Helfrid Hochegger

Genome Damage and Stability Centre, University of Sussex, UK



Surviving polyploidy : from mitotic slippage to centrosome clustering

Randy Y. C. Poon

Division of Life Science, The Hong Kong University of Science and Technology, Hong Kong



13:00-13:10 Opening Remarks

Session Chair: Ryota Uehara (Graduate School of Life Science, Hokkaido University)

13:10-13:50 Plenary Talk 1

How to Capture Cells Undergoing Asynthetic Fission- and Where to Find Them
Chen-Hui Chen (Institute of Cellular and Organismic Biology, Academia Sinica, Taiwan)

13:50-14:10 Regular Talk 1

When cells become large: implications for cellular stress and neurodegeneration
Kazuhide Asakawa (Department of Gene Function and Phenomics, National Institute of Genetics)

14:10-14:20 Short Talk 1

How ploidy dynamics shape cellular adaptation and evolution
Minji Jo (Japanese Foundation for Cancer Research)

14:20-14:40 Coffee Break

Session Chair: Yuichiro Miyaoka (Regenerative Medicine Project, Tokyo Metropolitan Institute of Medical Science)

14:40-15:00 Sponsored Seminar

**Efficient Isolation of Tetraploid Human iPSC Clones by CELL HANDLER™2:
An Image-Based Automated Cell-Picking Technology**
Yumi Shizuku (Yamaha Motor Co., Ltd.)

15:00-15:10 Short Talk 2

Physiological Occurrence and Pathological Involvement of Polyploidy in Pancreatic Acinar Cells
Guang Yang (Graduate School of Frontier Biosciences, The University of Osaka)

15:10-15:20 Short Talk 3

Effects of whole-genome duplication on three-dimensional organization of cell populations
Fuyu Sato (Graduate School of Life Science, Hokkaido University)

15:20-15:30 Group Photo

15:30-17:00 Poster Session 1



Session Chair: Kazuhide Asakawa (Department of Gene Function and Phenomics, National Institute of Genetics)

09:30-10:10 Plenary Talk 2

**Tipping the mitotic switch:
how the CDK1–Greatwall–PP2A-B55 α balance sets the route to polyploidy and cell death**
Helfrid Hochegger (Genome Damage and Stability Centre, University of Sussex, UK)

10:10-10:30 Regular Talk 2

Vulnerabilities in cell division control in non-diploid state
Ryota Uehara (Graduate School of Life Science, Hokkaido University)

10:30-10:40 Short Talk 4

Reorganization of three-dimensional genome architecture during mitosis-independent G1 transition
Yoko Hayashi (RIKEN BDR)

10:40-11:10 Coffee Break

Session Chair: Yuki Hara (Evolutionary Cell Biology Laboratory, Yamaguchi University)

11:10-11:30 Regular Talk 3

Establishment and application of tetraploid human iPS cells
Yuichiro Miyaoka (Regenerative Medicine Project, Tokyo Metropolitan Institute of Medical Science)

11:30-11:50 Regular Talk 4

Wounding induces preexisting multinucleated cells to survive and thrive as leader cells
Yuta Takahashi (Department of Biochemistry, Kyushu University)

11:50-12:00 Short Talk 5

AAV and PEG-mediated fusion to generate tetraploid human iPS cells
Tomoko Kato (Regenerative Medicine Project, Tokyo Metropolitan Institute of Medical Science)

12:00-13:00 Lunch Break

Session Chair: Tomonori Matsumoto (Graduate School of Frontier Biosciences, The University of Osaka)

13:00-13:40 Plenary Talk 3

Surviving polyploidy: from mitotic slippage to centrosome clustering

Randy Y. C. Poon (Division of Life Science, Hong Kong University of Science and Technology, Hong Kong)

13:40-14:00 Regular Talk 5

Organelle size scaling in *Caenorhabditis elegans* tetraploid embryos

Yuki Hara (Evolutionary Cell Biology Laboratory, Yamaguchi University)

14:00-14:20 Regular Talk 6

Mitotic perichromosomal layer: a physical barrier preserving chromosome integrity

Shigehiro Yoshimura (Faculty of Science, Kyushu University)

14:20-14:30 Short Talk 6

Coding sequence clustering universally predicts fine- and coarse-scale chromatin compartment landscapes

Rory Cerbus (RIKEN BDR)

14:30-15:00 Coffee Break

Session Chair: Yuichiro Miyaoka (Regenerative Medicine Project, Tokyo Metropolitan Institute of Medical Science)

15:00-15:40 Plenary Talk 4

Tetraploid neurons in the normal and pathological mammalian brain

Jose M. Frade (Department of Molecular and Cellular Neuroscience, Cajal Neuroscience Center, Spain)

15:40-16:00 Regular Talk 7

Separating mononucleated from binucleated hepatocytes: uncovering metabolic heterogeneity

Takeshi Katsuda (The Research Institute for Cell Design Medical Science, Yamaguchi University)

16:00-16:10 Short Talk 7

Route-dependent principles of proliferative regulation following whole-genome duplication

Masaya Inoko (Graduate School of Life Science, Hokkaido University)

16:10-16:20 Short Talk 8

Adaptive role of spindle size scaling with whole-genome duplication in human cells

Qijiao Wang (Graduate School of Life Science, Hokkaido University)

16:20-16:30 Short Talk 9

Optochemical elucidation of a critical role of the incomplete spindle assembly checkpoint in zebrafish development

Akira Matsura (Faculty of Advanced Life Science, Hokkaido University)

16:30-18:00 Poster Session 2

18:00-20:00 Reception

Session Chair: Ryota Uehara (Graduate School of Life Science, Hokkaido University)

09:30-10:10 Plenary Talk 5

**Non-canonical mechanisms of tetraploidy-mediated tumorigenesis:
the case of size and stromal cell composition**
Daniela Cimini (Department of Biological Sciences, Virginia Tech, USA)

10:10-10:30 Regular Talk 8

**Single-cell mapping of chromosome breaks identifies novel fragile site classes
with distinct DNA replication timing landscapes**
Jothivanan Elumalai (RIKEN BDR)

10:30-11:00 Coffee Break

Session Chair: Tomoko Kato (Regenerative Medicine Project, Tokyo Metropolitan Institute of Medical Science)

11:00-11:40 Plenary Talk 6

Polyploid Cell Cycles in Development and Disease
Brian R Calvi (Department of Biology, Indiana University, USA)

11:40-12:00 Regular Talk 9

Cancer evolution driven by ploidy alterations
Tomonori Matsumoto (Graduate School of Frontier Biosciences, The University of Osaka)

12:00-13:00 Lunch Break

Session Chair: Daisuke Matsumoto (Regenerative Medicine Project, Tokyo Metropolitan Institute of Medical Science)

13:00-13:20 Regular Talk 10

Consequences of Polyploidization Induced by Cell Fusion
Tomomi Tsubouchi (Department of Applied Life Sciences, Shizuoka University)

13:20-13:40 Regular Talk 11

Vertebrate Genomic Environments Shaped by Ancient Polyploidization
Yuichiro Hara (School of Frontier Engineering, Kitasato University)

13:40-14:00 Regular Talk 12

Unique responses to ploidy changes in mammalian early embryogenesis
Miho Ohsugi (Department of Biological Sciences, The University of Tokyo)

14:00-14:20 Poster Award Ceremony

14:20-14:30 Closing Remarks



1	When cells become large : implications for cellular stress and neurodegeneration Kazuhide Asakawa Department of Gene Function and Phenomics, National Institute of Genetics
2	Coding sequence clustering universally predicts fine- and coarse-scale chromatin compartment landscapes Rory Cerbus RIKEN BDR
3	Single-cell mapping of chromosome breaks identifies novel fragile site classes with distinct DNA replication timing landscapes Jothivanan Elumalai RIKEN BDR
4	Reorganization of three-dimensional genome architecture during mitosis-independent G1 transition Yoko Hayashi RIKEN BDR
5	Single-Cell Level Profiling of Genome Editing by CRISPR-Cas9 in Tetraploid Human iPS Cells Lanyu Huang Regenerative Medicine Project, Tokyo Metropolitan Institute of Medical Science
6	Route-dependent principles of proliferative regulation following whole-genome duplication Masaya Inoko Graduate School of Life Science, Hokkaido University
7	Replication Stress-Driven Endoreplication during Keratinocyte Differentiation Sota Itamoto Department of Dermatology, Hokkaido University
8	Proteotoxic stress induced by ploidy alteration Rion Ito Graduate School of Frontier Biosciences, The University of Osaka
9	AAV and PEG-mediated fusion to generate tetraploid human iPS cells Miyu Kinoshita Regenerative Medicine Project, Tokyo Metropolitan Institute of Medical Science
10	Optochemical elucidation of a critical role of the incomplete spindle assembly checkpoint in zebrafish development Akira Matsura Faculty of Advanced Life Science, Hokkaido University



11	Exploration of methods and conditions to improve PEG-based cell fusion efficiency
	Hiromasa Morii Department of Applied Life Sciences, Shizuoka University
12	Unique division dynamics of binucleated cells induced by cell fusion
	Joey Nakane Department of Applied Life Sciences, Shizuoka University
13	Effects of Increased CEP192 Expression Associated with Tetraploidization on Mitotic Cells
	Ryoto Nomura Graduate School of Life Science, Hokkaido University
14	Distinct Aneuploidy-Linked Gene Co-expression Characterizes the Transcriptomic Profile of HepG2
	Kaito Ogura Graduate School of Life Science, Hokkaido University
15	Establishment of a method for isolating a single chromatid from mouse oocytes to generate trisomic mosaic embryos
	Ibuki Ohmori Department of Biological Sciences, The University of Tokyo
16	A zebrafish line for live imaging of DNA double-strand break sites in vivo
	Kohei Oji Department of Gene Function and Phenomics, National Institute of Genetics
17	Effects of whole-genome duplication on three-dimensional organization of cell populations
	Fuyu Sato Graduate School of Life Science, Hokkaido University
18	Differentiation and analysis of skeletal muscle cells from Human Tetraploid iPS Cells
	Moe Sato Regenerative Medicine Project, Tokyo Metropolitan Institute of Medical Science
19	Differentiation and analysis of Hepatocytes from Human Tetraploid iPS Cells
	Kayoko Shinozaki Regenerative Medicine Project, Tokyo Metropolitan Institute of Medical Science
20	Adaptive role of spindle size scaling with whole-genome duplication in human cells
	Qijiao Wang Graduate School of Life Science, Hokkaido University





21	Dynamics of chromosomal instability following polyploidization Ako Watanabe Graduate School of Frontier Biosciences, The University of Osaka
22	Elucidation of the tetraploid selective role of chTOG in mitotic control Chiharu Watanabe Graduate School of Life Science, Hokkaido University
23	Mononucleated vs Binucleated Hepatocytes –Functional Differences at Equivalent Ploidy– Yusuke Watanabe Graduate School of Engineering, The University of Tokyo
24	The Perichromosomal Layer in the Maintenance of Genome Integrity Hiroya Yamazaki Faculty of Science, Kyushu University
25	Physiological Occurrence and Pathological Involvement of Polyploidy in Pancreatic Acinar Cells Guang Yang Graduate School of Frontier Biosciences, The University of Osaka
26	Effects of Elevated DNA-to-Cytoplasm Ratio on Mouse Preimplantation Development Zhihan Yang Department of Biological Sciences, The University of Tokyo