

International Meeting for Evolution of Reproductive Biology and Task of Frontiers: Trajectory and Prospects of IVF, Stem Cell and Epigenetic Studies

This International Meeting is sponsored by the Ministry of Education, Culture, Sports, Science and Technology in Japan (MEXT) and organized by the Society for Reproduction and Development (SRD) will be held at AIINA, Morioka, Japan from 13 ~ 15 September 2011.

During the last 50 years, *in vitro* fertilization (IVF) and embryo transfer (ET) studies and technologies have developed remarkably, and these techniques have expanded the scope and opened various new fields in reproductive biology as well as molecular biology.

SRD has contributed to this progress; in the early 1960s, the non-surgical ET method was developed, in the mid-1980s, an IVM-IVF bovine calf was produced, in 2000, a bovine calf was conceived using a somatic cell nuclear transferred ovum. Now these remarkable advances reflect a new insight into reproductive biology and biological issues such as embryonic stem cells, induced stem cells and epigenetic studies.

In this symposium, we will review the historical and evolutionary development of *in vitro* embryonic studies and discuss the future of reproductive biology. This meeting focuses on IVF, ET, Stem cells, Epigenetics and feto-maternal communication.

We would like to express our sincere appreciation to the invited speakers and chairpersons for their vigorous cooperation, young scientists for posters and all participants for active discussion. We also acknowledge the MEXT for funding this international meeting. All contributions encourage the further development of Reproductive Biology.

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Miharu YONAI (Tohoku Agricultural Research Center,
National Agriculture and Food Research Organization)

Date: September 13–15, 2011

Place: Room 1 (AIINA hall) and Metropolitan Morioka New Wing

Tuesday, 13

Opening Remark International Symposium for SRD		Room1
15:40–15:45	Kazuyoshi HASHIZUME (Iwate University)	
Session 1. Frontiers for <i>In Vitro</i> Fertilization, Embryo Culture and Embryo Transfer		Room1
Chairpersons:	Takashi NAGAI (National Institute of Livestock and Grassland Science) Atsuo OGURA (RIKEN BioResource Center)	
15:45–16:15 IS1-1	Yutaka TOYODA (Obihiro University of Agriculture and Veterinary Medicine) A Historical Perspective on IVF, <i>In Vitro</i> Embryo Culture and ET in Japan	
16:15–16:50 IS1-2	Christopher G. GRUPEN (The University of Sydney) Frontiers of IVF in Livestock Species: Factors Affecting Efficiency	
16:50–17:10 IS1-3	Hiroshi SUZUKI (Obihiro University of Agriculture and Veterinary Medicine) Puppies from Frozen Embryos	
17:10–17:45 IS1-4	George E. SEIDEL, JR. (Colorado State University) Sexing Mammalian Sperm	
17:45–18:20 IS1-5	Jean-Paul RENARD (INRA-CNRS-ENVA) From a Functional to a Molecular Assessment of Totipotency	
18:20–18:40 IS1-6	Kazuhiro KIKUCHI (National Institute of Agrobiological Sciences) Abnormality and the Restoration of <i>In Vitro</i> -produced Porcine Embryos	
Plenary Speech		Metropolitan Morioka New Wing
Chairperson:	Noboru MANABE (The University of Tokyo)	
19:00–19:45 IS-PS	Ryuzo YANAGIMACHI (University of Hawaii Medical School) Fertilization Studies and Assisted Fertilization in Mammals: Their Development and Future	
20:00–21:30	Reception, Metropolitan Morioka New Wing	

Wednesday, 14

Session 2. Embryonic Cell Differentiation and Functions in Feto-maternal Dialogue

Room1

- Chairpersons: Masashi TAKAHASHI (Kyushu Okinawa Agricultural Research Center)
Hiromichi MATSUMOTO (Utsunomiya University)
- 13:00–13:20 Atsuo OGURA (RIKEN BioResource Center)
IS2-1 Critical Involvement of Aberrant X Chromosome Inactivation in the Defective Postimplantation Development of Cloned Embryos
- 13:20–13:55 Haibin WANG (Chinese Academy of Sciences)
IS2-2 Molecular Determinants of Blastocyst Competency for Implantation
- 13:55–14:15 Satoshi TANAKA (The University of Tokyo)
IS2-3 Difference in the DNA Methylation Status Arises after Segregation of Trophoblast and Embryonic Cell Lineages
- 14:15–14:50 Michael J. SOARES (University of Kansas Medical Center)
IS2-4 Regulatory Pathway Controlling Uterine Spiral Artery Remodeling
- 14:50–15:10 Tea Break
- Chairpersons: Kazuhiko IMAKAWA (The University of Tokyo)
Satoshi TANAKA (The University of Tokyo)
- 15:10–15:30 Toru TAKAHASHI (National Institute of Agrobiological Sciences)
IS2-5 Novel Proteins Affecting Cell Proliferation and Angiogenesis of Bovine Placenta
- 15:30–16:05 Fuller W. BAZER (Texas A&M University)
IS2-6 Select Nutrients in the Uterine Lumen of Sheep and Pigs Affect Conceptus Development
- 16:05–16:40 Niamh FORDE (University College Dublin)
IS2-7 Gene Expression in the Bovine Endometrium: The Effects of Altered Progesterone Concentrations and the Presence of the Conceptus
- 16:40–17:00 Nobuhiko YAMAUCHI (Kyushu University)
IS2-8 Development of the Endometrial Spheroids as a Model for Implantation *In Vitro*
- 17:00–17:35 Thomas E. SPENCER (Washington State University)
IS2-9 Endogenous Retroviruses: A Model System for Understanding Physiological Adaptation to a Rapidly Evolving Ruminant Genome
- 17:35–17:55 Koji YOSHINAGA (National Institutes of Health)
Summary of the Day: Future of Implantation Studies

Thursday, 15

Session 3. Stem Cells and Epigenetics

Room1

Chairperson: Kunio SHIOTA (The University of Tokyo)

13:30–14:00 Shintaro YAGI (The University of Tokyo)

IS3-1 DNA Methylation Profiling by Tissue-dependent and Differentially Methylated Regions (T-DMRs) in Pluripotent Stem Cells: Insights into Genome Organization

14:00–14:30 Yasuhisa MATSUI (Tohoku University)

IS3-2 Epigenetic Regulation of Primordial Germ Cell Development

14:30–15:00 Yoshinori SEKI (Albert Einstein College of Medicine)

IS3-3 Exposure to a Maternal High Fat Milieu Alters the Hepatic Epigenome in Mice

15:00–15:30 Masako SUZUKI (Albert Einstein College of Medicine)

IS3-4 Genome-wide DNA Methylation Profiling of Male and Female Mouse Embryonic Stem Cell Differentiation Using Massively Parallel Sequencing

15:30–15:45 Tea Break

15:45–16:15 Kenichiro HATA (National Research Institute for Child Health and Development)

IS3-5 Epigenetics of Human Reproduction and Developmental Abnormality

Special Lecture

16:15–17:00 Scott COONROD (Cornell University)

IS3-6 Role for PAD Enzymes in Chromatin Structure, Gene Regulation, and Disease

17:00–17:20 Discussion with All Invited Speakers

Closing Remark for International Meeting

Room1

17:35–17:50 Noboru MANABE (The University of Tokyo)

Date: September 13–15, 2011

Poster Session

- ISP1 Trophoblast-specific DNA Methylation Occurs after the Segregation of Trophectoderm and Inner Cell Mass in Mouse Periimplantation Embryo
○ Momo NAKANISHI, Koji HAYAKAWA, Kunio SHIOTA, Satoshi TANAKA
(The University of Tokyo)
- ISP2 ATP Content in Bovine Oocytes May not Determine the Timing of First Cleavage and Further Developmental Competence after IVF
○ Vibuntita CHANKITISAKUL^{1,2}, Tamas SOMFAI¹, Yasushi INABA¹, Mongkol TECHAKUMPHU², Takashi NAGAI¹
(¹National Institute of Livestock and Grassland Science, National Agriculture and Food Research Organization; ²Department of Obstetrics, Gynaecology and Reproduction, Faculty of Veterinary Science, Chulalongkorn University, Thailand)
- ISP3 Excessive Pre-treatment of Mouse Spermatozoa with DNA Non-interacting Agents Causes Zygotic Chromosomal Damage
○ Hiroyuki WATANABE¹, Hiroshi SUZUKI², Yutaka FUKUI², Hiroyuki TATENO¹
(¹Asahikawa Medical University, ²Obihiro University of Agriculture and Veterinary Medicine)
- ISP4 Epithelial-mesenchymal Transition of Trophectoderm Cells during Embryo Implantation
○ Toshihiro KONNO, Sachiko YAMAKOSHI, Rulan BAI, Takashi CHAEN, Mahiro EGASHIRA, Nana NOMURA, Toshihiro SAKURAI, Kazuhiko IMAKAWA
(Graduate School of Agricultural and Life Sciences, The University of Tokyo)
- ISP5 Identification of Endogenous Retroviruses Derived-gene Possessing a Zinc Finger Like Sequence during Bovine Peri-attachment Period
○ Hanako BAI¹, Toshihiro SAKURAI¹, So NAKAGAWA², Toshihiro KONNO¹, Takayuki MIYAZAWA³, Takashi GOJOBORI², Kazuhiko IMAKAWA¹
(¹Graduate school of Agricultural and Life Sciences, The University of Tokyo; ²National institute of Genetics; ³Institute for Virus Research, Kyoto University)
- ISP6 Effect of Naloxone, a Mu-opioid Receptor Antagonist, on Oocyte Maturation and Embryonic Development in Pigs
○ Thanh Quang DANG-NGUYEN^{1,2}, Nguyen VIET LINH^{2,3}, Rosa MINOIA⁵, Masahiro KANEDA¹, Tamas SOMFAI¹, Seiki HARAGUCHI¹, Satoshi AKAGI¹, Kazuhiro KIKUCHI⁴, Michiko NAKAI⁴, Atsushi TAJIMA² and Takashi NAGAI¹
(¹National Institute of Livestock and Grassland Science, National Agriculture and Food Research Organization; ²University of Tsukuba; ³University of Tokyo; ⁴National Institute of Agrobiological Sciences; ⁵University of Bari, Italy)