

# IETS

## KYOTO 2007

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*Program  
and  
Registration Book*

*33rd Annual Conference  
of the  
International Embryo Transfer Society*

*January 7-9, 2007  
Kyoto International Conference Hall  
Kyoto, Japan*

**On the Cover:**

The letters (a kind of poem) are from “Makurano sousi” which was written in 990s by Sei Shonagon. The English version was published as “The Pillow Book of Sei Shonagon” in 1928 by Arthur David Waley. The meaning of the letters are:

“On a bright moon light night  
Crossing a river on a coach led by a bull  
How tasteful it is to see scattered water,  
made by bull’s each step, shining like breaking crystal.”

-Translated by Taku Nagai with a little help from Naojiro Minami-

The hand writing of the poem was done by Madoka Hasegawa at Tohoku University

# Invitation from the President

I would like to invite you to the 2007 Annual Conference of the International Embryo Transfer Society (IETS) to be held in January. The IETS is an active organization of academic, medical, veterinary and industry scientists with interests in a wide variety of the latest embryo technologies, including embryo transfer, in vitro embryo production, embryo culture, cloning and transgenesis, that involve species ranging from domestic agricultural, laboratory and companion animals to wild, endangered species and humans.

This year the conference is being held in Kyoto, Japan, at the Kyoto International Conference Hall. The Program Co-chairs, Drs. Carol Keefer and Fulvio Gandolfi, have selected a variety of topics for the Conference under the theme “Embryo Quality and Fetal Development—Early Determinants of Developmental Success.” The main conference will be preceded by two different one-day Pre-conference Symposia (both on Saturday, January 6). The topic of the first Pre-conference Symposium, organized by Drs. Jeremy Thompson and Gabor Vajta, is “Innovative Techniques in Human and Animal Embryology,” and the topic for the second Pre-conference Symposium, organized by Drs. Harpreet Kochhar, Michel Thibier and Hiroshi Imai, is “Assisted Reproductive Technologies and Food Safety in Farm Animals.” The main meeting will be followed by a one-day Post-conference Symposium, organized by Dr. Akira Iritani and the Local Organizing Committee, on “Quality Control of Embryos for Embryo Transfer and Related Advanced Technologies in Cattle.” Mark your calendars and plan to attend, and be informed by a great series of presentations as well as entertained by the evening social programs. Bring your family and friends and stay a few extra days to visit some of the many attractions Kyoto has to offer.

Best Wishes,

Takashi (Taku) Nagai  
President

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# Tentative Calendar of Events

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Event times and locations are subject to change; events may be added.

## Thursday, January 4, 2007

9:00–17:00 IETS Board of Governors Meeting

## Friday, January 5, 2007

9:00–17:00 IETS Board of Governors Meeting

8:00–16:00 Health And Safety Advisory Committee (HASAC)—Research Subcommittee

17:00–20:00 Health And Safety Advisory Committee (HASAC)—Regulatory Subcommittee

16:00–19:00 Registration with pick up of pre-registrations only

## Saturday, January 6, 2007

7:00–18:00 Registration

8:00–17:00 **Pre-conference Workshop: Successful Publishing in an English Language Journal**

8:00–17:00 **Pre-conference Satellite Symposium I: Innovative Techniques in Human and Animal Embryology**

8:15–17:05 **Pre-conference Satellite Symposium II: Assisted Reproductive Technologies and Food Safety in Farm Animals**

13:00–17:00 IETS Foundation Board of Trustees Meeting

16:30–18:30 W-1171 Research Group

18:00–20:00 Health And Safety Advisory Committee (HASAC)—Forms & Certificates Subcommittee

13:00–18:00 Poster Setup

13:00–18:00 Commercial Exhibit Setup

18:30–21:00 Opening Reception

## Sunday, January 7, 2007

7:30–8:30 Past President's Breakfast

7:30–8:30 Student Competition Breakfast with the Foundation Education Committee

7:00–18:00 Registration

8:00–9:30 Health And Safety Advisory Committee (HASAC)—Food Safety Subcommittee

8:00–17:00 Commercial Exhibits

8:00–12:00 **Pre-conference Workshop: Successful Publishing in an English Language Journal**

8:00–17:00 A/V Library/Speaker Preparation

8:30–10:00 IETS Foundation Education Committee

9:30–10:00 **Opening and Welcome**

10:00–12:00 **Session I: Oocyte Quality**

12:00–13:30 Lunch Break

12:30–14:00 Poster Session I

14:00–16:00 **Session II: Early Embryo Development**

16:00–16:30 Break

16:30–18:00 IETS Foundation: Student Competition Presentations

18:00–19:30 Bioniche Think Tank

## Monday, January 8, 2007

7:30–15:30 Registration

8:00–18:00 Commercial Exhibits

8:00–17:00 A/V Library/Speaker Preparation

# Tentative Calendar of Events

Event times and locations are subject to change; events may be added.

## Monday, January 8, 2007 (cont)

- 8:00–10:30      **Session III: Long-Term Consequences on Development**  
10:30–11:00      Coffee Break/Exhibition  
10:30–13:30      Tea Ceremony  
11:00–12:30      Poster Session II  
11:00–12:30      IETS Data Retrieval Committee Meeting  
12:30–13:30      Lunch Break  
13:30–15:30      **Session IV: Implantation and Gestation**  
15:30–16:00      Coffee Break/Exhibition  
16:00–16:30      IETS-Pioneer Award Presentation  
16:30–17:30      IETS Annual Business Meeting  
17:30–19:30      Health And Safety Advisory Committee (HASAC)—Open Meeting

## Tuesday, January 9, 2007

- 7:30–8:30      Organizational Meeting of the IETS Foundation  
8:00–15:00      Registration  
8:00–13:30      Commercial Exhibits  
8:00–17:00      A/V Library/Speaker Preparation  
8:30–10:30      **Session V: Sperm Evaluation and Physiology**  
10:30–11:00      Coffee Break/Exhibition  
11:00–11:30      IETS-Distinguished Service Award  
11:30–12:00      IETS-Foundation Student Competition Awards, CANDES & HASAC Updates  
12:00–13:30      Lunch Break  
12:00–13:30      5<sup>th</sup> IETS Annual Running Competition  
13:30–15:00      **Practitioner's Forum: The Use of Embryo Transfer for Improvement of Fertility in Dairy Cows**  
15:00–15:30      Coffee Break/Exhibition  
13:30–15:00      Commercial Exhibit & Poster Teardown  
15:30–16:30      **Session VI: Keynote Address**  
16:30–17:00      Closing Ceremony  
17:00–18:00      Organizational Meeting of the IETS Board of Governors  
18:00–21:30      Banquet & Dance Party

## Wednesday, January 10, 2007

- 8:00–18:00      **Post-conference Sattellite Symposium: Quality Control of Embryos for Embryo Transfer and Related Advanced Technologies in Cattle**

## Thursday, January 11, 2007

- 9:00–17:00      **Post-conference Tour:** Excursion to see the world-famous Japanese Black cattle (Wagyu) and to taste their marbled beef with Sukiyaki

*<http://www.iets.org/2007>*

*Check out the IETS Web Site for changes in the Calendar of Events and other activities as well as links to the sponsor web sites.*

# Registration Information

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- Registration Materials** All registration materials are included in this mailing. Each technical registrant should complete the enclosed General Registration Form. One registrant per form. Please use the enclosed form to register for all events, including the Workshop and Satellite Symposia. Registration materials are also available on the IETS web site at <http://www.iets.org/2007>.
- Registration Deadline** Those whose registrations are postmarked November 15, 2006, or before will pay a lower rate than those who send in their registration after November 15, 2006. No telephone or e-mail registrations will be accepted. FAX (217) 398-4119 registrations will be accepted only if payment is made by credit card. Be sure to pre-register to avoid higher prices, missed events and long lines in Kyoto.
- Membership Information** You do not have to be a member of the IETS to attend the conference. However, the difference between the member and nonmember registration fees makes joining the Society at the time of registration very attractive. A membership application for the IETS is included in this booklet on page 20.
- Payment** Payment must accompany the registration form. Checks must be in US funds made payable to the IETS. Payment by credit card (Visa, MasterCard, American Express or Discover) is available. Please complete the credit card payment section of the General Registration Form.
- Confirmations/Receipts** If you pre-register by November 15, 2006, we will mail you a registration confirmation/receipt. Please verify the receipt and events registered for and contact the IETS Business Office with any questions.
- Calendar of Events** Included in this booklet on pages 2 and 3 is a tentative calendar of events for the conference. Event times and locations are subject to change and certain events may be added.
- Proceedings** Participants will receive the proceedings with their registration packet in Kyoto. **NEW!** This year you will have the option of a printed book or CD copy of the proceedings; please indicate your choice on the registration form. IETS members who are unable to attend the conference will be mailed a CD copy of the proceedings after the conclusion of the event.
- Reminder** Wear your name tag at all functions; it is your admission pass to all conference events. Tickets for special events and functions will be collected at the door or at the table. All tickets look alike, but event name, location and date will appear on them. Be sure to give the ticket takers the appropriate ticket.
- Special Needs** All conference rooms are wheelchair accessible. Please indicate any special needs when sending in your registration form.
- Questions???** All inquiries about pre-registration or the conference should be made to the IETS Business Office, 1111 North Dunlap Avenue, Savoy, IL 61874 USA; phone: (217) 398-4697; FAX: (217) 398-4119; e-mail: [iets@assoqh.org](mailto:iets@assoqh.org).

## On-Site Registration Hours

<b>Friday, January 5</b>	<b>16:00–19:00</b>
Pre-registration Pickup Only—On-site registration to start Saturday	
<b>Saturday, January 6</b>	<b>07:00–18:00</b>
<b>Sunday, January 7</b>	<b>07:00–18:00</b>
<b>Monday, January 8</b>	<b>08:30–15:30</b>
<b>Tuesday, January 9</b>	<b>08:00–15:00</b>

# General Information

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## ***At the Conference***

Your conference packet will be available for collection from the Registration Desk near the Main Entrance of the venue during registration hours.

## ***Venue***

Kyoto International Conference Hall (KICH; <http://www.kich.or.jp/en/index.html>)

\*The name of the venue will be changed to the Kyoto International Conference Center (KICC) beginning January 1, 2007.

## ***Internet Access***

Internet access is available from your notebook PC through the wireless LAN system. The access area is located in front of the Main Hall, and approximately 30 PCs can be connected at the same time. Access using a desktop PC will also be available during the course of the meeting.

## ***Climate***

January is mid-winter in Japan. In general, the climate in Kyoto City may be considered mild, as it usually does not snow more than a couple of days in the year and never reaches more than a few degrees below 0°C. The average daytime temperature in Kyoto during the month of January is 60°F (15°C), dropping to an average of 28°F (-2°C) overnight.

## ***Currency***

The Japanese yen is the legal tender in Japan. There are currency exchange centers located in the Kansai International Airport. Currency exchange is also available in the venue and in banks in Kyoto city (open 9:00 and close 15:00). For up-to-date currency information, check the following web sites: <http://finance.yahoo.com/currency?u> or <http://www.xe.net/ucc/>. International credit cards are accepted throughout the country, but not in the venue. Traveler's checks can be changed at banks and hotels. Most shops, other than those at sightseeing places, are unaccustomed to traveler's checks. Japan is undoubtedly a cash society, and obtaining cash beforehand is highly recommended when visiting the country.

## ***Electricity***

The voltage throughout Japan is 100 volts. Japanese electrical plugs have two pins and fit into North American outlets.

## ***Language***

The official conference language will be English.

## ***Time Zone***

Japan Standard Time is 9 hours ahead of Greenwich Mean Time (= GMT + 9).

## ***Passport & Visa Information***

Foreign visitors entering Japan must carry a valid passport. Apply for a passport well in advance, as it may take months to process. A visa is required for citizens of countries that do not have visa-exempt agreements with Japan. Contact your local Japanese Embassy or Consulate for visa requirements and further details, as each country has a different policy for application. You may also visit the the Ministry of Foreign Affairs of Japan web site at [http://www.mofa.go.jp/j\\_info/visit/visa/index.html](http://www.mofa.go.jp/j_info/visit/visa/index.html).

## **New Passport Requirements for Travel Outside the US**

Effective December 31, 2006, all travelers—including US citizens—will be required to hold a valid passport to enter the United States by air and by sea. This also applies when coming from Canada, Mexico, Central and South America, the Caribbean and Bermuda. Under this new policy, all travelers departing the US who intend to re-enter the United States are required to hold a valid passport upon departure from the US. For more details, contact the US Department of State.

# Travel Information

## Access to Japan

The Kansai International Airport (KIX) is the best to access the 2007 IETS meeting in Kyoto. Most Japanese people will take their New Year's holidays from December 28, 2006, through January 8, 2007. Because of this long vacation, many Japanese will spend their holidays overseas and return around the start of the 2007 IETS meeting; **therefore, an earlier reservation for air tickets to Japan is strongly recommended.**



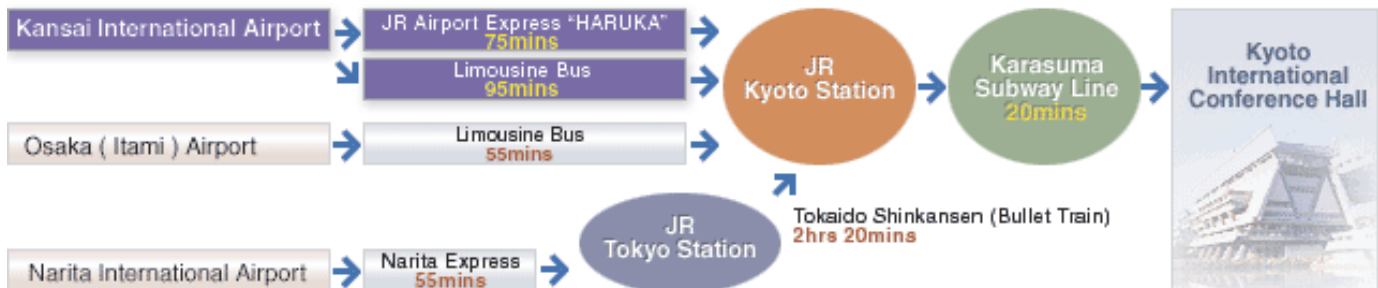
## Access to Kyoto Station

From Kansai International Airport (<http://www.kansai-airport.or.jp/english/index.htm>)

- 75 minutes by JR “Haruka” Kansai Airport Limited Express
- 95 minutes by Limousine Bus or Taxi

From Narita International Airport (<http://www.narita-airport.jp/en/index.html>)

- 2 hours and 15 minutes from Tokyo Station by the JR “Nozomi” Shinkansen (Bullet Train)



## From Kyoto Station to the Venue or Hotels

The main methods of transportation used when traveling within Kyoto are the subway lines, buses and taxis.

### Subway

The immensely reliable Subway is the easiest method of transportation to reach the Kyoto International Conference Hall (KICH), located at the north end of the Karasuma line. It is 20 minutes from Kyoto Station (Kokusaikaikann Station), and most of the signs are in Japanese and English.

### Taxi

Taxis are another option for traveling within Kyoto. Kyoto is the city with the largest number of taxis in Japan, and are consequently easily found on all major roads. Japanese taxis are safe, clean and comfortable to ride.

### City Bus

Most of Kyoto's innumerable temples, shrines and other cultural treasures are located away from the subway lines and are better accessed by the network of city buses.

Detailed instructions on using the subway, city buses and taxis are available on the IETS meeting web site ([www.iets.org/2007](http://www.iets.org/2007)).

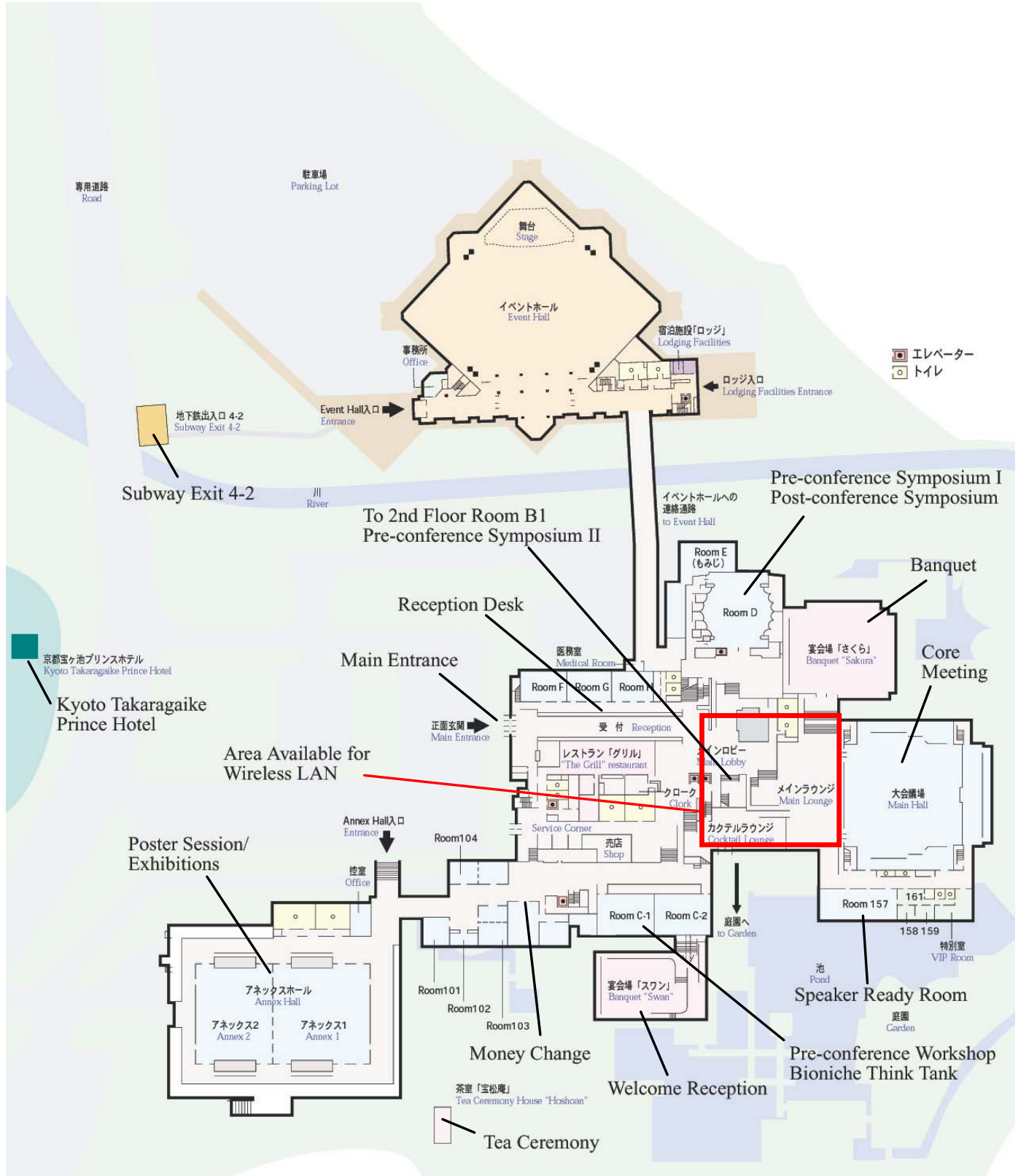


# The Venue and Meeting Room Layout

## The Venue for the 2007 IETS Meeting

Kyoto International Conference Hall (KICH; <http://www.kich.or.jp/en/index.html>)

\*The name of the venue will be changed to the Kyoto International Conference Center (KICC) beginning January 1, 2007.



## Accommodation Information

JTB Western Japan has been appointed as the official travel agent for the Society and will handle all related travel arrangements, including hotel accommodations and tours.

JTB EC Sale Dept.

Western Japan Regional Headquarters

Kyutaro-machi,

Chuo-ku, Osaka

541-0056 Japan

Phone: +81-6-6260-5076

Fax: +81-6-6263-0717

E-mail: m\_sakimoto480@jtb.jp

### *Hotel Accommodations*

JTB Western Japan has reserved a block of hotels in Kyoto during the Society conference. Reservations will be made on a first-come, first-served basis. Please indicate your order of preference on the application form.

	Name of Hotel	Room charge		Nearest Subway Station Time required
		Single	Twin	
A	Kyoto Takaragaike Prince Hotel	*13,000 yen	16,000 yen	Kokusai kaikan 5 min walk
B	Hearton Hotel Kyoto	9,000 yen	14,000 yen	Oike Sta. 5 min. walk
	Mitsui Garden Hotel Kyoto Sanjo	9,000 yen	15,000 yen	Oike Sta. 7 min. walk
	Aranvert Hotel Kyoto	8,000 yen	15,000 yen	Gojo Sta. 3 min. walk
C	Hotel Gimmond Kyoto	8,000 yen	14,000 yen	Oike Sta. 5 min. walk
	Mitsui Garden Hotel Kyoto Shijo	8,000 yen	14,000 yen	Shijo Sta. 7 min. walk
	Hotel Hokke Club Kyoto	7,000 yen	13,000 yen	Kyoto Sta. 2 min. walk

Note:

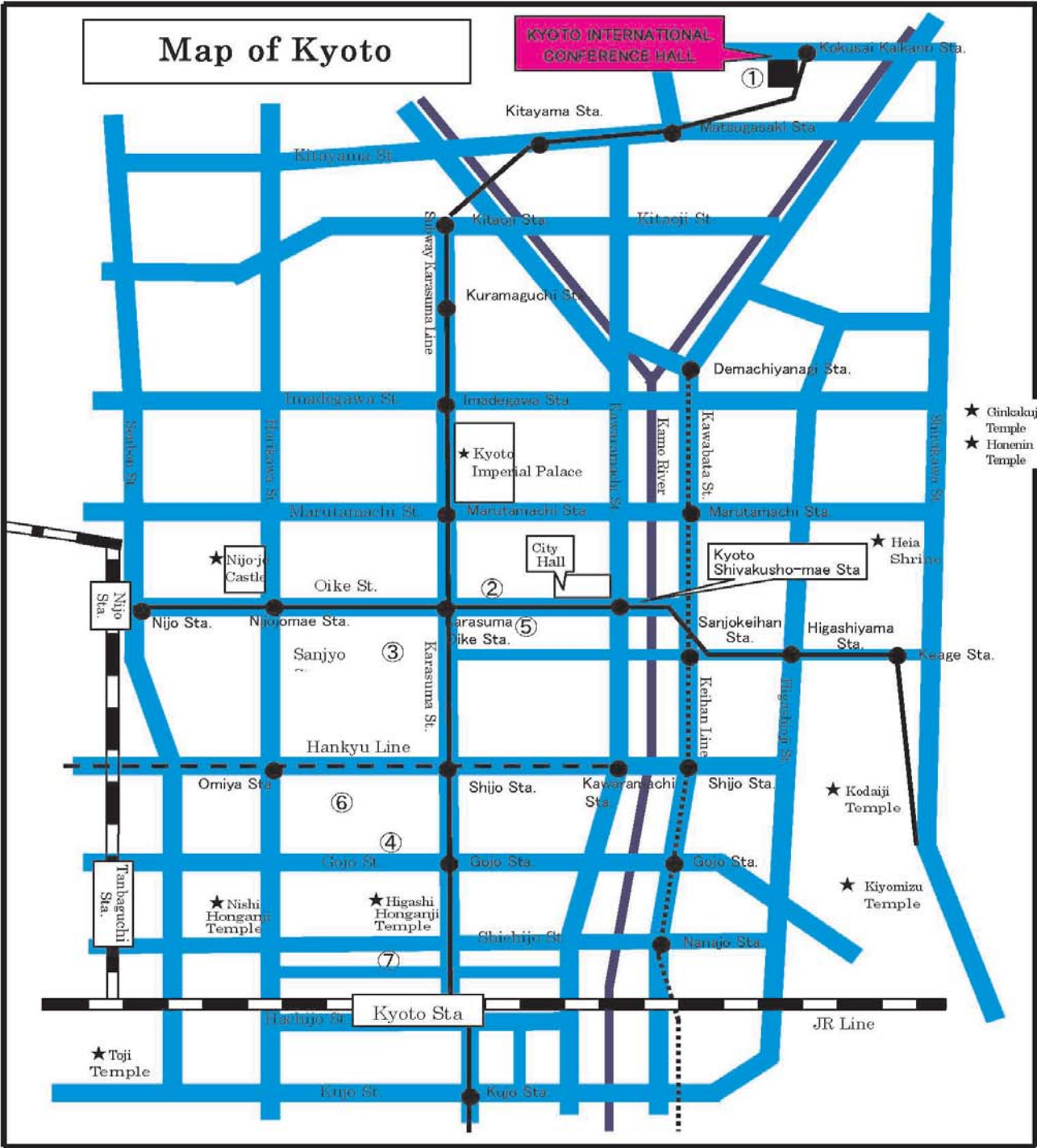
1) Room rates include tax and service charge. 2) Room rates do not include breakfast.

3) Rates with an asterisk (\*) are for twin rooms with single occupancy.

**Hotel reservations may be made on-line at [www.iets.org/2007](http://www.iets.org/2007) or via the printed form included with this booklet.**

### ***Hotel Reservations***

*The deadline for hotel reservations is **December 8, 2006.**  
Please make your hotel reservation before this date to ensure  
that you receive the discounted rate.*



# Program

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## *Embryo Quality and Fetal Development— Early Determinants of Developmental Success*

### **Session I—Oocyte Quality**

*Evaluation of oocyte quality: Morphological, cellular and molecular predictors.*

Qing-Yuan Sun, State Key Laboratory of Reproductive Biology, Institute of Zoology, Chinese Academy of Sciences, Beijing, China

Mounting evidence that oocyte quality profoundly affects fertilization and subsequent embryo development spurs the continued search for reliable predictors of oocyte developmental competence. We will provide an overall summary and analysis of potential criteria that can be used to evaluate oocyte quality. These criteria are purposively classified as morphological, cellular or molecular predictors. Traditional methods for evaluation of oocyte quality are based on morphological classification of the follicle, cumulus–oocyte complex, polar body (PB) or meiotic spindle. Although the use of morphological characteristics as predictors of oocyte quality is controversial, such a grading system can provide valuable information for preselecting oocytes with higher developmental competence and may therefore maximize embryo developmental outcomes. When compared with morphological parameters, cellular and molecular predictors of oocyte quality are proposed to be more precise and objective. Several intrinsic markers for oocyte quality may be used as indicators for oocyte competence. On the other hand, several extrinsic markers such as apoptosis of follicular cells, concentrations of growth factors in follicular fluid (FF) or serum and gene expression profiles of cumulus cells also have been reported to be tightly correlated with oocyte competence and embryo quality.

*Oocyte quality and strategies to improve oocyte cryopreservation in domestic animals.*

Sergio Ledda, Department of Animal Biology University of Sassari, Italy

Despite significant progress in cryopreservation of mammalian oocytes and embryos, many of the molecular and biochemical events that underlie this technology are poorly understood. In recent years, researchers have focused on obtaining viable oocytes that are developmentally competent. Even in the most favorable conditions, experimental approaches have obtained only limited success as compared with fresh oocytes used in routine in vitro embryo production. Chilling injuries and toxic effects of the cryoprotectants are the major adverse consequences following cryoprotocols. Different strategies have been developed to improve cryopreservation results. These strategies have included reducing container volumes, increasing the thermal gradient, changing the cell surface/volume ratio, enhancing cryotolerance by supplementation with various additives, or modifying the lipid–lipid composition of the oocyte membrane. To develop new strategies for reducing the various forms of stress associated with oocyte cryopreservation, it is fundamental to gain a better understanding of the major changes responsible for poor post-thaw survival. With this knowledge, we hope that oocyte cryostorage will become a fully reliable reproductive technique in the near future.

### **Session II—Early Embryo Development**

*Maternally derived transcripts: Identification and characterization during oocyte maturation and early cleavage.*

Nam-Hyung Kim, National Research Laboratory of Molecular Embryology, Chungbuk National University, Cheongju, Chungbuk, Korea

Identification and characterization of differentially regulated genes in oocytes and early embryos are required to understand the mechanisms involved in maturation, fertilization, cleavage and early embryonic development. Improved RT-PCR-based differential display, real-time RT-PCR, cDNA microarray and in silico mining have been applied to identify maternal effect genes in mammalian oocytes. Moreover, conventional gene knockout and RNA interference techniques have been used to characterize the specific functions of maternally derived genes. The regulatory mechanisms of the activities of maternally derived genes in mammals are currently under investigation. These findings may subsequently be applied to animal biotechnology procedures, such as improvement of culture systems for in vitro maturation, in vitro embryo production, cloning by nuclear transfer and IVF in the clinic. The present talk focuses on the identification and functions of maternally derived transcripts during oocyte maturation, fertilization and early cleavage.

## *Temporal and spatial control of gene expression in early embryos of domestic species.*

Tiziana A.L. Brevini, Istituto Anatomia Animal Domestica, Milano, Italy

A gradual transition from oocyte-derived mRNA and proteins to full embryonic transcription characterizes early embryonic development. Messenger RNAs and proteins of maternal origin accumulate in the oocyte throughout its growth in the ovary. This presentation will describe some of the mechanisms activated upon fertilization in early embryos of domestic species that control the appropriate use of such material and prepare for the synthesis of new ones. Data will be presented on the control of gene expression by the 3' untranslated regions and their interaction with specialized sequences at the 5' cap end. The process of RNA sorting and localization, initially demonstrated in different cell types and in oocytes of lower species, will also be discussed, particularly in relation to its possible role in regulating pig early development. Finally, specific genes involved in the activation of cattle embryonic transcription will be described. This brief overview will provide some suggestions on how these different mechanisms may be integrated and how they cooperate to ensure the correct initiation of embryonic development.

## **Session III—Long-Term Consequences on Development**

### *Embryo culture and long-term consequences.*

Jeremy G. Thompson, The University of Adelaide, School of Paediatrics and Reproductive Health, Adelaide, Australia

There is now clear evidence that conditions used during mammalian embryo culture can cause variation in the phenotype of the resulting fetus and offspring, especially in relation to growth characteristics and possibly other characteristics, such as mental development. This appears to be an adaptive response to the environment encountered. The well characterised adaptive responses by the developing fetus to environmental perturbations which lead to fetal programming can now be extended to the concept of “embryonic programming.” This presentation will examine some of the phenotypic changes that occur following embryo culture under different environments, especially the work in our own laboratory which targets specific environmental perturbations during embryo culture. None of these cause reduced early development to the blastocyst stage in vitro, but following transfer there are consequences for both pregnancy establishment and subsequent development. In particular, we will examine the link between embryo physiology and the induction of cellular stress by these specific environmental stressors. We will also examine mechanisms of how this may occur, primarily by investigating the interaction between energy production mechanisms of the early embryo and subsequent development.

### *Long-term effects of nutritional programming of the embryo and fetus: Mechanisms and critical windows.*

Michael E. Symonds, Academic Division of Child Health School of Human Development, Queen's Medical Centre, Nottingham, United Kingdom

The maternal nutritional and metabolic environment is critical in determining not only reproduction but also long-term health and viability. One key nutrient that may modulate these types of effects is the supply of glucose from the mother to the fetus. The maintenance of a balance and appropriate supply of glucose from the mother to the fetus may be pivotal in ensuring optimal embryonic, placental and fetal growth. An increase or decrease in maternal plasma glucose, either alone or in conjunction with other macro- or micronutrients, may result in offspring with an increased risk of a range of adult diseases. Large animals, such as sheep, provide a valid model for maternal–fetal nutritional studies owing to the similarities to humans in fetal development, number and maturity at birth and outcomes following nutritional manipulation. In this review, the effects of maternal nutritional manipulation in large animals at defined stages of gestation coinciding with embryo development, maximal placental or fetal growth will be discussed.

## **Session IV—Implantation and Gestation**

### *Pregnancy recognition and conceptus implantation in domestic ruminants: Roles of progesterone, interferons and endogenous retroviruses.*

Thomas E. Spencer, Texas A&M University, College Station, Texas, USA

New information on pregnancy recognition and conceptus development and implantation in sheep with respect to regulation by progesterone, interferons and endogenous retroviruses will be discussed. After formation of the corpus luteum, progesterone acts on the endometrium and stimulates blastocyst growth and elongation to a filamentous

# Program

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conceptus (embryo/fetus and associated extraembryonic membranes). The envelope of endogenous viruses related to Jaagsiekte sheep retroviruses (enJSRVs) appears to intrinsically regulate trophoblast cell proliferation and differentiation into giant binucleate cells. The mononuclear trophoblast cells of elongating sheep conceptuses secrete interferon tau (IFNT), which acts on the endometrium to prevent development of the luteolytic mechanism. Progesterone downregulation of its receptors (PGR) in luminal and glandular epithelia correlates temporally with induction of secreted galectin 15 (LGALS15) and secreted phosphoprotein one (SPP1), which are proposed to regulate trophoblast proliferation and adhesion. IFNT acts on the endometrial luminal epithelium to induce WNT7A and to stimulate LGALS15, cathepsin L (CTSL), and cystatin C (CST3), which are candidate regulators of conceptus development and implantation. The number of potential contributors to maternal recognition and establishment of pregnancy continues to grow and highlights our limited appreciation of the complexity of the key molecules and signal transduction pathways that intersect during these key developmental processes.

*Gene expression and maintenance of pregnancy in the bovine: Roles of trophoblastic binucleate cell-specific molecules.*

Kazuyoshi Hashizume, Department of Veterinary Medicine, Iwate University, Morioka, Iwate, Japan

Various molecules participate in implantation and maintaining endometrial function during gestation. Advances in molecular biological technologies, such as microarrays, contribute to clarifying the intricate dialogue between the fetus and dam, because microarrays enable changes in the expression levels of thousands of genes to be monitored simultaneously. Cell-to-cell interaction plays a pivotal role in the regulation of placentogenesis and the exchange of stage-specific developmental signals between the fetal and maternal units. These interactions are paramount for programmed fetal growth, maternal adaptation to pregnancy and coordination of parturition. However, little is known about the precise regulation of placentation and maintenance of gestation in cattle. In the ruminant, the binucleate cell plays a central role in forming the structures and secretions at the feto-maternal interface that are crucial in establishing and maintaining pregnancy. We summarized differences in the abundance of specific RNA transcripts in the bovine cotyledon and caruncle using global gene expression profiling, and further investigated the relationship of mRNA abundance for select pregnancy-specific genes of interest (identified from microarray studies) across pregnancy that were exclusively localized to the binucleate cell, such as placental lactogen, prolactin-related proteins and pregnancy-associated glycoproteins. Our results suggest that a well-orchestrated transcriptional command from the binucleate cells is pivotal to the establishment and progression of pregnancy in cattle.

## Session V—Sperm Evaluation and Physiology

*State of the art in farm animal sperm evaluation.*

Heriberto Rodriguez-Martinez, Faculty of Veterinary Medicine SUAS, Uppsala, Sweden

Our ability to screen the structural and functional integrity of the spermatozoon in vitro has increased dramatically over the past decades, but not our capacity to estimate the fertility of a semen sample, or of the sire from which it has been collected, especially in selected farm animal breeders. Estimation of fertility is constrained by several factors, e.g., type of cell, analysis strength, sperm deposition strategies, recordings of fertility, and so on, including the fact that the ejaculate is composed of a diverse sperm population. Such cell heterogeneity is not only reflected in differences in the persistence of attributes needed for fertilization, such as motility, but also in the relative ability of spermatozoa to remain fertile over time, and to endure exogenous selection steps and stimuli, all of which account for innate variations in fertilizing ability among doses, ejaculates and sires. Determination of the concentrations and conditions required to maintain a sperm population with competence for fertilization would allow for a better estimation of fertility. The value of these analyses is hereby discussed.

*Interactions of sperm with the female reproductive tract: Inspiration for assisted reproduction.*

Susan Suarez, Cornell University, Ithaca, New York, USA

Interactions of sperm with the female tract prepare them for fertilization in ways that are different from methods used to prepare sperm for AI, IVF and ICSI. After natural mating, bull sperm are rapidly removed from seminal plasma when they enter the cervical mucus, in contrast to the slower dilution of seminal plasma that sperm experience in vitro in preparation for AI, IVF and ICSI. Sperm passage through the uterotubal junction involves interactions of sperm

surface proteins with the junction, which could modify the sperm, oviduct or both. In the oviduct, binding of sperm to the epithelium stabilizes them for storage and enables them to live longer than they do in vitro. As the time of ovulation approaches, unidentified factors in the oviduct initiate capacitation and hyperactivation in the sperm. Although capacitation and hyperactivation can be induced in vitro, the inducers used may be less efficient or effective than those in vivo, thereby accounting for the need to use thousands of sperm to achieve fertilization of an oocyte in vitro. Finally, evidence indicates that chemotactic factors guide sperm to the oocyte in vivo, whereas successful fertilization in vitro may depend on random collisions of sperm with the oocyte.

## Session VI—Keynote Address

*Stem cells and lineage development in the mammalian blastocyst.*

Janet Rossant, The Hospital for Sick Children, Toronto, Ontario, Canada

The mammalian blastocyst is the source of the most pluripotent stem cells known—embryonic stem (ES) cells. However, ES cells are not totipotent: In mouse chimeras they do not contribute to extraembryonic cell types of the trophectoderm and primitive endoderm lineages. Understanding the genetic pathways that control pluripotency versus extraembryonic lineage restriction is key to understanding not only normal embryonic development but also how to reprogram adult cells to pluripotency. The trophectoderm and primitive endoderm lineages also provide the first signals that drive patterned differentiation of the pluripotent epiblast cells of the embryo. My laboratory has produced permanent mouse cell lines from both the trophectoderm (TE) and the primitive endoderm (PrE), termed trophoblast stem (TS) and eXtraembryonic ENdoderm (XEN) cells. We have used these cells to explore the genetic and molecular hierarchy of lineage restriction and identify the key factors that distinguish the ES cell versus the TS or XEN cell fate. The major molecular pathways of lineage commitment defined in mouse embryos and stem cells are probably conserved across mammalian species, but more comparative studies of lineage development in embryos of nonrodent mammals will likely yield interesting differences in terms of timing and details.

## Practitioner's Forum

### The use of embryo transfer for improvement of fertility in dairy cows

Moderator: Prof. O. Dochi

In recent years, the fertility of dairy cows has gradually decreased everywhere around the world. The cause of the low fertility may vary considerably across countries. In this Practitioner's Forum, we will focus on and discuss on the use of embryo transfer for overcoming the low fertility in dairy cows.

*Relationship between endometrial epidermal growth factor (EGF) and fertility after embryo transfer in repeat-breeder cows*

Dr. S. Katagiri (Graduate School of Veterinary Medicine, Hokkaido University, Japan)

*Improved pregnancy after embryo transfer of frozen-thawed embryos in repeat-breeder Holstein cows*

Mr. K. Takahashi, DVM (Genetics Hokkaido Assoc., Japan)

*Improvement of fertility after embryo transfer in dairy cows under heat-stress conditions*

Dr. Vascelos, JLM (Faculdade de Medicina Veterinaria e Zootecnia, UNESP, Botucatu, SP, Brazil)

# Pre-conference Satellite Symposium I

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## Innovative Techniques in Human and Animal Embryology

January 6, 2007

Organizers: Jeremy Thompson (Adelaide, Australia)

Gábor Vajta (Tjele, Denmark)

### Timetable

- 8:00 Introduction
- 8:05 Keynote Lecture by Stanley Leibo
- 8:30 Section I—Maturation and Culture
- Oocyte maturation: Emerging concepts and technologies to improve developmental potential. Robert Gilchrist
  - Alternatives to culture in the petridish. Jeremy Thompson
  - Quantification of embryo quality by respirometry. Henrik Callesen, Ana Lopes
  - Metabolic profiling of human embryos in culture: Improving selection for transfer. Daniel Brison
- 10:10 Coffee Break
- 10:30 Section II—Stem Cells
- Derivation of human embryonic stem cell lines. Teija Peura
  - Maintaining epigenetic and genetic integrity of human ES cells. Maisam Mitalipova
  - Embryonic stem cells and animal models of early human development and adult disease. Kevin Sinclair
  - Isolation and characterization of pluripotent cell lines from pig embryos of different origins. Fulvio Gandolfi
- 12:10 Lunch
- 13:00 Section III—Cryopreservation
- Analysis of oocyte physiology to improve cryopreservation procedures. David Gardner
  - Highly efficient vitrification for cryopreservation of human oocytes and embryos: The Cryotop method. Masashige Kuwayama
  - Toward verification of vitrification parameters—What is really important for oocyte cryopreservation. Amir Arav
- 14:20 Coffee Break
- 14:40 Section IV—Embryo Manipulation
- Oocyte-induced enucleation reveals spindle-associated regulators of cytoplasmic developmental competence. Eric Overstrom
  - Comparative approach to nuclear transfer with the zona free method in cattle, horse, pigs and sheep. Cesare Galli
  - Artificial gametes: When and how? Zsolt Peter Nagy
  - The porcine epidermal stem cells as a biomedical model for wound healing and normal/malignant epithelial cell propagation. Jan Motlik
- 16:20 General Discussion and Conclusion



# Pre-conference Satellite Symposium II

## Assisted Reproductive Technologies and Food Safety in Farm Animals

January 6, 2007

Organizers: Dr. H. Kochhar, Dr. M. Thibier, and Dr. H. Imai

8:45 Opening address—Dr. Michel Thibier, France

### *Section I: Newer Assisted Reproductive Technologies*

9:00 Animal clones and methodology of cloning—Dr. Keith Campbell, UK

9:30 Transgenic animal production and animal biotechnology—Dr. Jim Robl, USA

### *Section II: Newer Assisted Reproductive Technologies and Impacts on Food Safety*

10:00 Comparison of cloned and noncloned cattle and their product evaluation over a 3 year period—  
Dr. Yvan Heyman, France

10:30 Health Break

11:00 How healthy are animal clones and their progeny? Five years of field experience—  
Dr. Martin Panarace, Argentina

11:30 Food safety of products derived from cattle clones—Dr. Seiya Takahashi, Japan

12:00 Safety and nutritional data on clones and the effects of introducing a specific transgene on a  
complex biological fluid and important food—Dr. Goetz Laible, New Zealand

12:30 Lunch

14:00 Meat composition of offspring derived from cloned boars—Dr. Irina Polejeava, USA

14:30 Normality of pig clones and their offspring—Dr. Jin-Hoi Kim, South Korea

15:00 Health Break

### *Section III: Regulatory Considerations in Animal Biotechnology*

15:30 Regulatory considerations in transgenic livestock from the aspect of Cartagena Protocol in  
Japan—Dr. Kazuhiko Yamanouchi, Japan

16:00 Current status for regulating biotechnology-derived animals in Canada—Animal health and food  
safety considerations—Dr. Harpreet Kochhar and Dr. Brian Evans, Canada

16:30 The US Food and Drug Administration (FDA) and animal cloning: Risk and regulatory  
approach—Dr. Larisa Rudenko or  
Dr. John Matheson, USA.

17:00 Concluding remarks—Dr. Takashi Nagai, Japan

17:05 Adjournment.

### *Features of the program*

Genetically modified livestock in agriculture are already an experimental reality and can rapidly become a commercial reality. The challenge is to see whether the existing science based safety-assessment model will work and whether the current marketing practices will be up to this challenge. The acid test of industry practices will be their capacity to build consumer confidence. On the other hand, scientists engaged in the development of transgenic livestock intended to supply food must recognize that regulators and the general public consider the transgenic technology as a considerable shift from the traditional animal breeding practices. Livestock breeding is and will continue to be a balancing act of multiple trait selection, and it is naïve to believe that transgenes will become so important as to monopolize the selection process. Food safety and regulatory requirements for transgenic livestock are not yet definitive, but clearly have the potential to affect important areas such as trade certifications, animal identification, product identity and traceability. Hence, this symposium will be an effort to flush out the issues pertaining to the science, food safety data from experiments in animal cloning and transgenesis, regulatory initiatives in this direction and the public perception of this technology. The program will have three components:

1. Newer Assisted Reproductive Technologies—Cloning, Transgenesis, etc.: The presenters will provide an overview of the technologies and show how we are at a stage at which there is a potential to market the food and products derived from these animals.
2. Food Safety Components: The presenters in this subtheme will provide valuable data in terms of safety of food derived from animal clones or transgenics as well as the parameters and strategies used to generate the data.
3. Regulatory Considerations: A tough decision to approve or not to approve the food based on the scientific information guides the regulations (which at present time are unclear for the biotechnology-derived animals). The presenters will look at the specific approaches of assessment by different countries and the public perception of the food derived from such animals.

## Post-conference Satellite Symposium

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# Quality Control of Embryos for Embryo Transfer and Related Advanced Technologies in Cattle

January 10, 2007

8:00 Opening address: Local Organizing Committee Chair, Dr. A. Iritani (Japan)

8:15 Introduction: Dr. Y. Izaike (Japan)

### **Session I: Oocyte collection following superstimulation and ovum pick-up (OPU)**

8:30 Superovulation in the cow: Effects of gonadotrophins and follicular wave status.  
Dr. R. J. Mapletoft (Canada)

9:00 The efficiency of embryo production by OPU. Dr. K. Imai (Japan)

9:30 Application of ultrasound-guided follicular aspiration (OPU) in prepubertal and adult cattle.  
Dr. H. Niemann (Germany)

10:00 Coffee Break

### **Session II: Quality control of oocytes and embryos for in vitro production systems**

10:30 The role of growth factor signaling on oocyte quality and maturation. Dr. K. P. McNatty  
(New Zealand)

11:00 Embryo quality in bovine embryos: Influence of oocyte origin and culture environment on gene  
expression and developmental competence of IVF embryos. Dr. P. Lonergan (Ireland)

11:30 Noninvasive quality assessment of IVP embryos. Dr. H. Abe (Japan)

12:00 Lunch Break

### **Session III: Embryo cryopreservation and commercial application of frozen embryos**

13:30 Cryopreservation of manipulated embryos. Dr. S. P. Leibo (USA)

14:00 Essential methods of freezing embryos for application in animal reproduction management.  
Dr. O. Dochi (Japan)

14:30 Vitrification and direct transfer of bovine embryos. Dr. G. Seidel (USA)

15:00 Mass production of cattle from IVM, IVF and cryopreservation of in vitro-produced embryos in  
Japan. Dr. Hamano (Japan)

15:30 Coffee Break

### **Session IV: Early embryonic-loss and maintenance of early pregnancy with manipulated embryos**

16:00 What drives the formation of trophectoderm during early embryonic development?  
Dr. R. M. Roberts (USA)

16:30 Interaction between fetal and maternal environments during early pregnancy in domestic species.  
Dr. T. Ezashi (Japan)

17:00 Failure of uterine-conceptus interactions in cattle. Dr. T. R. Hansen (USA)

17:30 Improving pregnancy maintenance in dairy cows. Dr. W. W. Thatcher (USA)

17:30 Adjournment

## Workshop for Authors Publishing Scientific Papers in English

Presented by

**John P. Kastelic, DVM, PhD, Co-Editor-in-Chief, *Theriogenology***

**Rose M. Kastelic, BA (French), MA**

Many manuscripts are delayed or rejected because of poor experimental design, analysis and presentation of data, and writing. This workshop is an overview of how to plan and conduct research, analyze and present your data, write a paper and interact with editors and reviewers. In addition to presentations of principles and common errors, there will be exercises and interactive discussions.

This workshop is primarily designed for those for whom English is a second language. Therefore, English syntax, grammar and punctuation will be reviewed. However, this workshop will also be valuable for those for whom English is their native language, especially students and young scientists.

This is a Pre-conference Workshop (in association with the 2007 IETS Conference). The workshop will be held in the Kyoto International Conference Hall (IETS Conference location) in Kyoto, Japan, on Saturday, 6 January (8:00 to 17:00) and Sunday, 7 January (8:00 to 12:00).

Class size is limited to the first 20 participants. Registration fees are payable to IETS via the registration form. The reduced early registration fee (US\$200 for IETS members listed in current membership directory; US\$300 for nonmembers) must be received before 15 November 2006. The on-site registration fee is US\$250 for IETS members and US\$350 for nonmembers (if space is available). Student registration is US\$150 prepaid, or US\$200 at the door. The registration fee does not include meals.

Information about the workshop: [therio@shaw.ca](mailto:therio@shaw.ca) or 403-317-2236

Registration and fees: [iets@assochq.org](mailto:iets@assochq.org) or 217-398-4697

## Special Events

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### ***Public Program: From the Cell to the Animal—10 Years' Footprint from Dolly***

Friday, January 5, 2007

17:30–19:00

To be held at Kyoto University Clock Tower Centennial Hall.

This program is designed especially for young students (junior high school, senior high school and undergraduate students) to introduce them to transitions in the field of animal biotechnology, from past technologies to those expected in the future, with special reference to somatic cell nuclear transfer technology. This program is free of charge.

### ***Tea Ceremony***

Monday, January 8, 2007

10:30–13:30

A Japanese traditional tea ceremony program will be open to attendees on January 8 (Monday) at around lunchtime. The program will be held in the tearoom at the venue. The ceremony will be held in a separate group (~10–20 persons) and will take approximately 30–40 min. The registration fee is \$20 per person and includes Japanese green tea, a Japanese sweet and demonstration of the tea ceremony, with simultaneous translation service.

### ***Open Meeting of the Health And Safety Advisory Committee***

Monday, January 8, 2007

17:30 – 19:30

### ***Practitioner's Forum: The Use of Embryo Transfer for Improvement of Fertility in Dairy Cows***

Tuesday, January 9, 2007

13:30–15:00

Scheduled Speakers: Dr. S. Katagiri, Hokkaido University, Japan; Mr. K. Takahashi, DVM, Genetics Hokkaido Assoc., Japan; Dr. Vascelos, JLM, UNESP, Botucatu, SP, Brazil (see page 13 for full description)

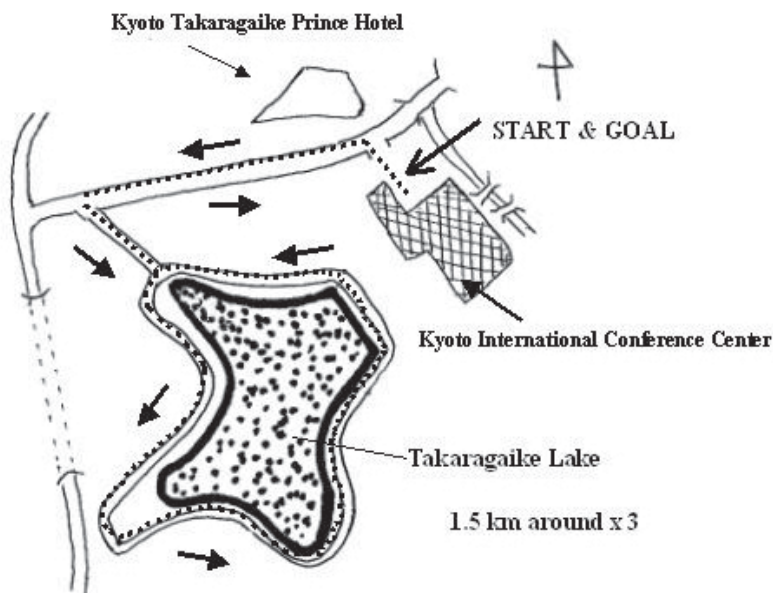
### ***5<sup>th</sup> IETS Annual Running Competition***

Tuesday, January 9, 2007

12:00

The traditional running competition will be held at a wonderful place—in a park, around a lake very close to the conference facilities (see attached map). To avoid problems with darkness (remember Copenhagen?) we have decided to hold the race on Tuesday, January 9, from 12:00 to 13:30. This time period will allow us ample time for slight modifications to the actual start time, which will be decided later.

The race will consist of 3 rounds around the lake (approx.  $3 \times 1.5$  km) plus the start–finish route, a



total of 5 km. I think the laps will make the event more spectacular and enjoyable for the spectators. We definitely hope that more young people will join us (so far, I've had the impression that the average age of participants increases faster than the passing years), and also that the Danish hegemony will be challenged, although both Poul Maddox-Hyttel and Peter M. Kragh, the previous winners, are expected to come. I have to extend special thanks to the Local Organizing Committee, Prof. Hiroshi Imai and all the volunteers he has offered us for the work they have done and will do to organize this event.

See you in Kyoto, around the lake,

Gabor Vajta

### ***Banquet***

Tuesday, January 9, 2007

18:00–20:00

### ***Dance Party***

Tuesday, January 9, 2007

20:00–21:30

Immediately following the Banquet

A dance party with Taku's Music Band will be held on January 9 (Tuesday) following the Banquet at the Swan Room. No registration fee is necessary, but there will be a charge for soft drinks and alcoholic beverages.

### ***Post-conference Tour***

Thursday, January 11, 2007

9:00–17:00

This one-day tour near Kyoto is an "Excursion to see the world-famous Japanese Black cattle (Wagyu) and to taste their marbled beef with Sukiyaki" and will include the following sites: a Wagyu farm, the Shiga Prefectural Animal Experimental Station, a lunch with "Sabu-shabu" or "Sukiyaki," the Biwa Lake (one of the biggest lakes in Japan) and the Hieizan Temple (a world heritage) during the New Year's holiday. A simultaneous translation service will be available. The tour will be open by the entry of more than 35 participants. The registration fee is \$80 per person.

## REMINDER

Early registration deadline is November 15, 2006

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By becoming a member of the IETS now, you will enjoy a reduced rate when you register for the 2007 Annual Conference. As a member, you will receive the on-line quarterly *Embryo Transfer Newsletter* of the IETS, on-line subscription to *Reproduction, Fertility and Development*, an on-line searchable membership directory, discounted rates for all sales items (books, videos & slides) offered by IETS and discounts and advance information on future conferences and events.

You will also be entitled to reduced subscription rates to *Theriogenology* and *Animal Reproduction Science*.

## *Membership Application International Embryo Transfer Society 2007 Annual Conference Special*

*Yes!* I'd like to become a new member of the IETS now for 2007 and save when I register for the conference.

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