



37th Annual Conference of the IETS
Wyndham Orlando Resort
January 8–12, 2011
Orlando, Florida



Program & Registration Book

Invitation from the President

I would like to invite you to the 37th annual conference of the International Embryo Transfer Society (IETS), which will be held in Orlando, Florida, January 8 to 12, 2011. The IETS is an active organization of academic, medical, veterinary, and industry scientists that focuses on all aspects of embryo technologies that involve species ranging from domestic agricultural, laboratory, and companion animals to non-domestic and endangered species, and humans. For the 2011 conference, we will be returning to Orlando for a stimulating meeting. The program co-chairs for our main conference, Eckhard Wolf and Ciro Barros, have designed an excellent scientific program with the theme “Reproductive Biotechnology at the Interface Between Animal Agriculture and Biomedical Research.” The meeting should have a wide appeal to members of our society. The conference will include a Preconference Symposium on “Advances in Bovine Reproduction and Embryo Technology” organized by Cliff Lamb and Jose Santos and a Preconference Workshop on “Plasticity, Fate Control, and Therapeutic Applications of Domestic Animal Stem Cells” arranged by Fulvio Gandolfi. The main conference will be followed by a Postconference Workshop on transport issues associated with gametes and reproductive tissues, titled “International Regulations and Requirements for the Import/Export of Reproductive Biomaterials: Embryos, Semen, and Tissues” and arranged by Naida Loskutoff. The Local Organizing Committee, chaired by Pete Hansen, has worked hard preparing for the meeting. Mark your calendar and plan to attend the conference in Orlando. Bring your family and friends and plan to stay a few extra days to enjoy the many attractions in Orlando.

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Tentative Calendar of Events

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

Thursday, January 6, 2011

9:00 – 18:00 IETS Board of Governors Meeting (Largo Key)

Friday, January 7, 2011

9:00 – 18:00 IETS Board of Governors Meeting (Largo Key)

9:00 – 18:00 Health and Safety Advisory Committee (HASAC) - Research Subcommittee (Azalea)

16:00 – 19:00 Registration (pick up of preregistrations only) (Palms Ballroom Foyer)

Saturday, January 8, 2011

7:00 – 18:00 Registration (Palms Ballroom Foyer)1

8:00 – 17:00 Preconference Symposium – Advances in Bovine Reproduction and Embryo Technology (Jasmine)

9:00 – 12:00 Health and Safety Advisory Committee (HASAC) – Regulatory Subcommittee (Azalea)

13:00 – 18:00 Poster Setup (Palms Ballroom)

13:00 – 17:00 IETS Foundation Board of Trustees Meeting (Executive Boardroom)

13:00 – 18:00 2nd DABE Workshop: Plasticity, Fate Control, and Therapeutic Safety of Stem Cells (Magnolia)

13:00 – 18:00 Commercial Exhibit Setup (Palms Ballroom)

14:00 – 17:00 Health and Safety Advisory Committee (HASAC) – Food Safety Subcommittee (Azalea)

17:00 – 18:00 IETS Student Group (The Morulas) Meet and Greet (Longboat)

Sunday, January 9, 2011

6:00 – 8:00 Poster Setup (Palms Ballroom)

7:00 – 18:00 Registration (Palms Ballroom Foyer)

7:30 – 8:30 Past Presidents' Breakfast (Cedar/Marathon)

7:30 – 8:30 Student Competition Breakfast with Foundation Education Committee (Longboat Key)

8:00 – 17:00 Commercial Exhibition (Palms Ballroom)

8:00 – 17:00 A/V Library/Speaker Preparation (Hibiscus)

8:30 – 9:30 IETS Foundation Education Committee (Largo Key)

8:45 – 9:00 Opening and Welcome (Floral Ballroom)

9:00 – 10:30 Session I: Follicular Reserve

10:30 – 11:00 Refreshment Break/Exhibition (Palms Ballroom)

11:00 – 12:30 IETS Foundation Student Competition Presentations (Floral Ballroom)

12:30 – 14:00 Lunch Break

12:30 – 14:00 IETS Board Luncheon with Affiliate Society Representatives (Azalea)

12:30 – 14:00 Health and Safety Advisory Committee (HASAC) – Forms and Certificates Subcommittee (Longboat)

14:00 – 15:30 Session II: Growth Factor and Follicular Development (Floral Ballroom)

15:30 – 16:00 Refreshment Break/Exhibition (Palms Ballroom)

16:00 – 17:30 Session III: Recent Advances in In Vivo and In Vitro Cryopreservation (Floral Ballroom)

17:30 – 18:00 Short presentations from submitted abstracts

18:00 – 20:00 Health and Safety Advisory Committee (HASAC) Open Meeting (Floral Ballroom)

20:00 Welcome Reception – Wyndham Orlando Resort

Monday, January 10, 2011

7:30 – 16:00 Registration (Palms Ballroom Foyer)

8:00 – 18:00 Commercial Exhibits (Palms Ballroom)

8:00 – 17:00 A/V Library/Speaker Preparation (Hibiscus)

Tentative Calendar of Events

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

- 8:30 – 10:30 Poster Session I/Refreshment Break/Exhibition (Palms Ballroom)
10:30 – 11:15 Session IV: Genetic Engineering of Livestock
11:15 – 12:30 Session V: From Epigenetics to Epigenomics
12:00 – 12:30 Short presentations from submitted abstracts
12:30 – 14:00 Lunch Break
12:30 – 14:00 IETS Data Retrieval Committee Meeting (Azalea)
12:30 – 13:30 Exhibitors Luncheon with the IETS Board (Cedar Key)
14:00 – 16:00 Session VI: Molecular Networks as Sensors and Drivers of Fertility (Floral Ballroom)
15:30 – 16:00 Short presentations from submitted abstracts
16:00 – 16:30 Refreshment Break/Exhibition (Palms Ballroom)
16:30 – 17:00 IETS Pioneer Award Presentation (Floral Ballroom)
17:00 – 18:00 IETS Annual Business Meeting (Floral Ballroom)
18:00 – 20:00 Companion Animal, Non-Domestic and Endangered Species (CANDES) Open Meeting (Floral Ballroom)
18:00 – 19:00 Domestic Animal Biomedical Embryology Committee (DABE) Open Meeting (Azalea)

Tuesday, January 11, 2011

- 7:00 – 8:30 Organizational Meeting of the IETS Board of Governors (Largo Key)
8:00 – 15:00 Registration (Palms Ballroom Foyer)
8:00 – 13:30 Commercial Exhibits (Palms Ballroom)
8:00 – 17:00 A/V Library/Speaker Preparation (Hibiscus)
8:30 – 10:30 Poster Session II/Refreshment Break/Exhibition (Palms Ballroom)
10:30 – 12:30 Practitioners' Forum: Recent Advances in Superovulation and Embryo Production (Floral Ballroom)
12:30 – 13:30 Lunch Break
12:00 – 13:30 Organizational Lunch Meeting of the IETS Foundation (Cedar Key)
13:30 – 17:00 Commercial Exhibit and Poster Teardown (Palms Ballroom)
13:30 – 14:00 IETS Foundation Student Competition Awards, CANDES and HASAC Updates (Floral Ballroom)
14:00 – 14:45 IETS Distinguished Service Award Presentation (Floral Ballroom)
15:00 – 15:45 Session VII: Keynote Address (Floral Ballroom)
15:45 – 16:00 Closing Ceremony (Floral Ballroom)
16:30 – 17:30 9th IETS Annual Running Competition (Wyndham Orlando Resort)
19:00 Closing Party (West Pool Pavilion)

Wednesday, January 12, 2011

- 7:30 – 11:00 Registration (Palms Ballroom Foyer)
8:00 – 17:00 Postconference Workshop: International Regulations and Requirements for the Import/Export of Reproductive Biomaterials: Embryos, Semen, and Tissue (Jasmine)

Check out the IETS website (<http://www.iets.org/2011>) for changes in the Calendar of Events and other activities as well as links to the sponsor web sites.

Registration Information

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 Pre- and Postconference Symposia. Registration materials are also available on the IETS website at <http://www.iets.org/2011>.

Registration Deadline

Registrations that are postmarked November 29, 2010, or before will receive a lower rate than those who send in their registration after November 29, 2010. No telephone registrations will be accepted. Faxed registrations [(217) 398-4119] will be accepted only if payment is made by credit card. Be sure to preregister to avoid higher prices, missed events, and long lines in Orlando.

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 19.

Payment

Payment must accompany the registration form. Checks must be in US funds drawn on a US bank 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 or print out the pdf registration form and mail or fax to the headquarters address or go online at https://secure.fass.org/reg_2011_IETS_intro.asp.

Confirmations/Receipts

If you preregister by November 29, 2010, you will receive 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 a copy of the proceedings with their registration packet in Orlando. This year a CD copy of the proceedings is included with your registration; you may purchase a copy of the printed proceeding 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 preregistration or the conference should be directed to the IETS Business Office, 2441 Village Green Place, Champaign, IL 61822 USA; phone: (217) 398-4697; fax: (217) 398-4119; e-mail: iets@assochq.org.

On-Site Registration Hours

Friday, January 7	16:00–19:00
Saturday, January 8	07:00–18:00
Sunday, January 9	07:00–18:00
Monday, January 10	07:30–16:00
Tuesday, January 11	08:00–15:00
Wednesday, January 12	07:30–11:30

General Information

At the Conference

Your conference packet will be available at the Registration Desk, located in the Palms Ballroom Foyer, during registration hours.

Venue

Wyndham Orlando Resort, Orlando, Florida, USA

Lunch and Dining Options

Guests of the Wyndham Orlando Resort can enjoy the signature cuisine of Augustine's Bar & Grille, a sophisticated International Drive Orlando restaurant. Begin your stay with a hearty breakfast at Augustine's Restaurant. The Fields and Sun breakfast buffet features traditional favorites served with Wyndham flair. After a long day on the town, come to Augustine's Restaurant for a perfectly cooked steak or seafood. Located next to Augustine's Restaurant you'll find Augustine's Market Deli, serving sandwiches, salads, and more. Grab a bite to eat or a refreshing cup of Starbucks coffee. Spend the day lounging by the pool at Gatorville Pool Bar and Restaurant. This unique restaurant is the perfect place to grab a refreshing iced beverage and soak in the Florida sunshine. Dine poolside on a menu featuring a blend of Caribbean and Key West flavors. Cool off at Screams Ice Cream Parlor, located just outside Gatorville.

World-Class Dining Just Steps from Your Door

The Wyndham Orlando Resort is surrounded by a variety of International Drive Orlando restaurant choices. Venture just moments from this International Drive Orlando resort to discover some of central Florida's finest restaurants. From Italian to Greek, you'll find it all here.

Services and Amenities

The Wyndham Resort is a family-friendly hotel offering guests the most relaxing, entertaining, and carefree time in Orlando. There is a complimentary shuttle service to and from Orlando's most popular theme parks, including Universal Orlando, SeaWorld, and Wet 'n Wild. They offer a shuttle to Disney World for a small fee. Visit their on-site ticket concierge to purchase tickets to all nearby parks.

Families and business travelers alike can enjoy an exclusive Health Club, open 7 days a week, featuring a sauna, steam rooms, and a modern fitness center with state-of-the-art strength training and cardio equipment.

Climate

Orlando weather in January is typically very comfortable with warm temperatures and moderate chance of rain. (There are about 6 days of rain in January.) Water parks and swimming pools in the Orlando area are open year-round. During the winter season the days are warm but the nights display a pleasant temperature decrease. In January, the Orlando average temperatures are 50°F (10°C; low) and 80°F (26°C; high).

Currency

The US Dollar is the legal tender in the United States. There are currency exchange centers located in Orlando Airport. For up-to-date currency exchange information, check the Universal Currency Converter™ at <http://www.xe.net/ucc/>. International credit cards are accepted throughout the country, and traveler's checks can be changed at banks, hotels, resorts, and most city stores.

Electricity

The standard for the United States is 110 volts. An adapter is needed for electrical appliances using another type of current, such as 220 volt European systems.

Language

The official conference language will be English.

Time Zone

Orlando is located in the Eastern Standard Time Zone, which is 3 hours behind GMT (= GMT - 5).

Passport and Visa Information

As with all IETS meetings, we expect attendees from all over the world. All foreigners who wish to enter the United States require a passport valid for six months. Invitation letters are located at http://www.iets.org/2011/inv_letter_request_form.asp.

Note:

- (a) For nationals included in the Visa Waiver Program (see Visas), passports must be valid for at least 90 days from date of entry.
- (b) All travelers entering the USA under the Visa Waiver Program require individual machine-readable passports. Children included on a parent's passport also now require their own machine-readable passport. Travelers not in possession of machine-readable passports will require a valid USA entry visa.
- (c) As of January 12, 2009, all travelers visiting the US under the Visa Waiver Program are to provide details online 72 hours prior to travel. For more information, please see below.
- (d) Passports issued on or after October 26, 2005, will need to have a biometric identifier in order for the holder to travel visa free under the Visa Waiver Program. Machine-readable passports issued between October 26, 2005, and October 25, 2006, require a digital photograph printed on the data page or an integrated chip with information from the data page. Machine-readable passports issued on or after October 26, 2006, will require an integrated chip with information from the data page (e-passport).

Visa Note:

- (a) Landed Immigrants of Canada and British residents of Bermuda who are citizens of, and have valid passports from, Commonwealth countries or Ireland are not eligible to enter the USA without a visa.
- (b) All passengers using US airports for transit purposes are required to obtain a transit visa. This does not affect qualified travelers travelling visa free under the Visa Waiver Program.
- (c) To qualify for visa-free travel under the Visa Waiver Program, nationals must travel on a valid passport, for holiday, transit, or business purposes only and for a stay not exceeding 90 days. (ESTA). See below for more information.
- (d) Holders of UK passports with the endorsement British Subject, British Dependent Territories Citizen, British Protected Person, British Overseas Citizen, or British National (Overseas) Citizen do not qualify for the Visa Waiver Program. A passport that states holder has right of abode or indefinite leave to remain in the UK does not qualify for visa-free travel.
- (e) A visa does not expire with the expiry of the holder's passport. An unexpired, endorsed visa in an expired passport may be presented for entry into the USA, as long as the visa itself has not been canceled, is undamaged, is less than 10 years old, and is presented with a valid, nonexpired passport, provided that both passports are for the same nationality.

Travel Information

Air Transportation

The best airport to fly into is Orlando International, code is MCO. The airport is located about 15 miles from the resort and is very easy to get to by rental car, taxi, or shuttle. The airport connects directly with most cities worldwide and has hundreds of arrivals and departures each day.

Ground Transportation

For individuals who are traveling alone, the least expensive way to travel is via the Mears Shuttle, which is located at ground transportation at the airport.

The IETS has contracted service with Mears Shuttle for a discounted rate. Round-trip cost is \$30.00 for adults and \$24.00 for children; however, with our contract and a discount coupon for \$4.00 off the round-trip cost, round-trip cost will be \$26.00 for adults and \$20.00 for children. The shuttle service is a shared-ride shuttle with up to 4 stops each way from/to the airport and Wyndham Orlando Resort. It carries a maximum of 11 passengers.

You must have your ticket or coupon with our priority code in order to qualify for the discount.

Mears Shuttle also has a Luxury Fleet, which consists of Town Cars, up to 3 passengers with luggage; SUVs, up to 5 passengers with luggage; and Luxury Vans, up to 7 passengers with luggage. The price is \$63.00 per vehicle from the airport for the luxury fleet and \$48.00 to the airport per vehicle. **The coupon discount DOES NOT pertain to the luxury fleet.**

Car Rental: The airport is located on a major roadway to the hotel, and there are only 1 or 2 exits to the hotel depending on the route taken.

Accommodation Information

Wyndham Orlando Resort
8001 International Drive
Orlando, Florida 32819
Phone: +1-407-351-2420
www.orlandowyndhamresort.com

General Hotel Information

With 42 acres of tropical landscape and secluded Floridian-style villas, the Wyndham Orlando Resort offers a vacation experience that other Orlando resorts can't. Explore the thrilling theme parks just moments away such as Walt Disney World®, Universal Studios®, and SeaWorld® Adventure Park during the day, and return to the tropical sanctuary at the end of your day. The Wyndham Orlando Resort also offers complimentary shuttle service to and from the theme parks and an on-site ticket concierge to make sure your Orlando vacation is completely carefree. The Orlando resort offers three large swimming pools, five on-site restaurants, an exclusive health club featuring a state-of-the-art fitness center, a whirlpool, steam rooms and saunas, concierge services, a full-service business center, and laundry services. The Wyndham Orlando Resort is the most family-friendly resort in Orlando, with two kids' splash pools, a playground, game room, volleyball courts, and kid-approved guest room features like bunk beds.

Room Rates Available for the IETS 2011 Annual Conference

The hotel confirms the following guest room rates: single occupancy \$118, double occupancy \$118.

Reservations

Please make your reservations directly with the hotel: +1-407-351-2420.

Make sure to mention that you are with the International Embryo Transfer Society Meeting.

Hotel Reservations

*The deadline for hotel reservations is **December 6, 2010**.
Please make your hotel reservation before this date to ensure
that you receive the discounted rate.*

Program

Main Theme: Reproductive Biotechnology at the Interface Between Animal Agriculture and Biomedical Research

Session I: Follicular Reserve

Does Size Matter in Females?

James Ireland, Michigan State University, East Lansing

The hypothesis that size of the ovarian reserve (number of healthy follicles and oocytes in ovaries) positively affects fertility has never been tested. This review presents results showing that ovarian ultrasonography can be used to phenotype cattle based on number of antral follicles growing during follicular waves. Young adult cattle with low follicle numbers have high circulating concentrations of gonadotropins but a diminished ovarian reserve and many phenotypic characteristics associated with ovarian aging and infertility including low concentrations of anti-Müllerian hormone and progesterone and poor responsiveness to superovulation compared with age-matched cattle with higher follicle numbers. Results also describe a new approach based on a single measurement of anti-Müllerian hormone to test the hypothesis about the relationship between size of the ovarian reserve and fertility. Also, new evidence shows that maternal environment has a role in regulation of the high variation in the ovarian reserve in offspring. In conclusion, the high variation in the ovarian reserve has a negative effect on ovarian function that may result in suboptimal fertility in cattle, and a single measurement of anti-Müllerian hormone can be used to determine if fertility is suboptimal in adult cattle with a diminished ovarian reserve.

In Vitro and In Vivo Regulation of Follicular Formation and Activation in Cattle

Joanne Fortune, Cornell University, Ithaca, New York

The establishment of a stockpile of nongrowing, primordial follicles and the gradual depletion of that follicular reservoir through activation of primordial follicles are essential processes for female fertility. However, the mechanisms that regulate follicle formation, the activation of primordial follicles to develop to the primary stage, and the primary to secondary follicle transition are poorly understood, especially in domestic animals and primates. Our laboratory is engaged in studying these early stages of follicular development in cattle, and this review summarizes the progress to date. Bovine follicles begin to form in fetal ovaries around the beginning of the second trimester of pregnancy (about day 90), but the first activated, primary follicles do not appear until after day 140. Bovine fetal ovaries produce steroids, and production is most active during the first trimester. In vitro, estradiol and progesterone act as negative regulators of follicle formation and of acquisition by newly formed follicles of the capacity to activate. Meiotic arrest of the oocyte in the diplotene stage of first meiotic prophase does not occur until after follicle formation and is correlated with acquisition of the capacity to activate. This may explain the gap between follicle formation and appearance of the first activated follicles. Once capacity to activate has been acquired, it seems likely that activation in vivo is controlled by the balance between stimulators and inhibitors of activation. Insulin and kit ligand stimulate activation and anti-Müllerian hormone inhibits it in vitro. Few bovine follicles transition from the primary to the secondary stage in vitro, but their numbers can be increased by medium supplements, testosterone, and vascular endothelial growth factor.

Session II: Growth Factor and Follicular Development

Recent Insights into Oocyte-Follicle Cell Interactions Provide Opportunities for the Development of New Approaches to IVM

Robert Gilchrist, University of Adelaide, Australia

The last 5 to 10 years of research in ovarian and oocyte biology have delivered some major new advances in knowledge of the molecular and cellular processes regulating oocyte maturation and oocyte developmental competence. These new insights include, among others, 1) the knowledge that oocytes regulate granulosa and cumulus cell differentiation, ovulation rate, and fertility via the secretion of soluble paracrine growth factors; 2) new perspectives on the participation of cyclic nucleotides, phosphodiesterases, and gap-junctions in the regulation of oocyte meiotic arrest and resumption; and 3) the new appreciation of the mechanisms of LH-induced oocyte

maturation and ovulation mediated by the follicular cascade of epidermal growth factor (EGF)-like peptides, the EGF receptor, and their intracellular second messengers. These recent insights into oocyte-follicle cell interactions provide opportunities for the development of new approaches to oocyte in vitro maturation (IVM). Laboratory IVM methodologies have changed little over the past 20 to 30 years, and IVM remains notably less efficient than hormone-stimulated IVF, limiting its wider application in reproductive medicine and animal breeding. The challenge for oocyte biologists and clinicians practicing IVM is to modernize clinical IVM systems to benefit from these new insights into oocyte-follicle cell interactions in vivo.

Follicular Somatic Cell Factors and Follicle Development

José Buratini, Jr., São Paulo State University, São Paulo, Brazil

Considerable attention is currently being paid to oocyte-derived secreted factors that act on cumulus and granulosa cells. Also important for follicle development are somatic-cell-derived secreted factors. This is illustrated by the ability of granulosa-cell-derived Kit ligand (KITL) to promote primordial follicle activation, and the loss of follicle development that accompanies KITL gene disruption. This review summarizes our current understanding of somatic cell factors during both preantral and antral follicle growth, involving not only signaling from granulosa cells to the oocyte, but also signaling between granulosa and theca cells. Principal granulosa-cell-derived factors include activin, anti-Müllerian hormone, bone morphogenetic proteins, and fibroblast growth factors. Theca cells also secrete bone morphogenetic proteins and fibroblast growth factors. The interplay between these factors is equally important for follicle growth as the activity of oocyte-derived factors.

Session III: Recent Advances in In Vivo and In Vitro Cryopreservation

Cryopreservation and In Vitro Culture of Caprine Preantral Follicles

José Ricardo de Figueiredo, LAMOFOPA, State University of Ceará, Brazil

Efficient procedures for cryopreservation of caprine preantral follicles (PF; enclosed in ovarian tissue or isolated) are available. Furthermore, cryopreserved follicles retain the ability to develop after in vitro culture (IVC) and restore gonadal function after transplantation. Significant advances were also observed in IVC protocols for caprine PF. High follicular survival rates have been obtained, and primordial follicles are able to enter the growth phase (activation) and reach the stage of secondary follicles. A major achievement was the in vitro development of isolated secondary PF up to antral stages and subsequent production of mature oocytes and embryos. However, the rate of oocyte maturation from caprine PF grown in vitro is still low, and more research is required to overcome this problem. Moreover, the great challenge for researchers involved in this important area is the production of embryos and subsequent offspring from oocytes enclosed in primordial follicles grown and matured in vitro. An efficient and reproducible IVC system will optimize animal production, could be used in the multiplication of threatened animals and in assisted reproduction techniques for women, and will offer an excellent model to toxicological and pharmacological studies related to effects of different compounds on follicular development.

Cells Under Pressure: How Sublethal Hydrostatic Pressure–Stress Treatment Increases Gametes' and Embryos' Performance

Csaba Pribenszky, Szent Istvan University, Budapest, Hungary

The principal approach in in vitro embryo culture and manipulation has been a defensive one: procedures aim to satisfy passively the supposed or real physiological needs of gametes and embryos. Similarly, during cryopreservation we try to cause minimal damage to the cells while attempting to obtain the highest achievable cell survival. Although, carefully chosen and precisely controlled sublethal stress treatment of cells has been described to improve embryos' and gametes' performance, and consequently, morphological survival, fertilization, in vitro development, pregnancy and farrowing rates improved considerably compared with untreated controls. This review summarizes studies that open up a new approach: instead of, and besides, trying to passively reduce the harm to the cells during in vitro manipulations and culture, procedures may also prepare the cells themselves to ward off or reduce the damages by tuning up the cells' own inner capacities.

Program

Session IV: Genetic Engineering of Livestock

Perspectives on Transgenic Livestock in Agriculture and Biomedicine – An Update

Jorge Piedrahita, North Carolina State University, Raleigh

It has been 30 years since the first transgenic mouse was generated (Brinster et al., 1981; Palmiter et al., 1982; Palmiter et al., 1983) and 26 years since the first example of moving the technology to livestock was published (Hammer et al., 1985). Although there was tremendous optimism in those initial years, with most convinced that genetically modified animals would play a significant role in agricultural production, that has not come to be. At first sight, one could conclude that this technology has to a large extent failed. On the contrary, we believe that it has succeeded beyond our original expectation, and we are now at what is perhaps the most exciting time in the development and implementation of these technologies. The original goals, however, have drastically changed, and it is now biomedical applications that are playing a central role in pushing forth both technical and scientific developments. The combination of advances in somatic cell nuclear transfer, the development of induced pluripotent stem cells, and the completion of the sequencing of most livestock genomes ensures a bright and exciting future for this field, not only in livestock but also in companion animal species.

Session V: From Epigenetics to Epigenomics

Epigenetic Control of Development and Expression of Quantitative Traits

Hélène Jammes, INRA, UMR INRA-ENVA, Jouy en Josas, France

In recent years, it has become increasingly clear that epigenomic regulation of gene expression is critical during embryo development and subsequently during pre- and postnatal life. The phenotype of an individual is the result of complex interactions between genotype and current, past, and ancestral environment leading to a lifelong remodeling of its epigenome. Practically, if the genome was compared to the hardware in a computer, the epigenome would be the software that directs the computer's operation. This review points out the importance of epigenetic processes for genome function in various biological processes, such as embryo development and expression of quantitative traits.

Session VI: Molecular Networks as Sensors and Drivers of Fertility

Next Generation Sequencing Allows Deeper Analysis and Understanding of Genomes and Transcriptomes

Including Aspects to Fertility

Thomas Werner, Genomatix Software Inc., Ann Arbor, Michigan

Reproduction and fertility are controlled by specific events naturally linked to oocytes, testis, and early embryonal tissues. A significant part of these events involves gene expression, especially transcriptional control and alternative transcription (alternative promoters or alternative splicing). Although methods to analyze such events for carefully predetermined target genes are well established, no methodology existed until recently to extend such analyses into a genome-wide de novo discovery process. With the arrival of next generation sequencing (NGS), it became possible to attempt genome-wide discovery in genomic sequences as well as whole transcriptomes at a single nucleotide level. This not only allows identification of the primary changes (e.g., alternative transcripts) but also helps to elucidate the regulatory context that leads to the induction of transcriptional changes. This review discusses the basics of the new technological and scientific concepts arising from NGS, prominent differences from microarray-based approaches, and several aspects of application to reproduction and fertility research. We will then illustrate these concepts in an application example of NGS sequencing data analysis involving postimplantation endometrium tissues from cows.

Dynamic Proteome Signatures in Gametes, Embryos, and Their Maternal Environment

Georg Arnold, Ludwig Maximilian University of Munich, Munich, Germany

During the last years, substantial advances have been achieved in proteomic approaches to cells and tissues relevant for mammalian reproduction. During gamete and early embryo development, de novo mRNA synthesis is silenced close to completion, making proteome analysis indispensable for the characterisation of macromolecu-

lar processes. We present quantitative dynamic proteome signatures addressing the effect of oestrus cycle on the endometrium proteome and describe embryo-induced alterations in the protein environment of this tissue. Furthermore, a proteomic study analysing in vitro maturation of bovine oocytes is presented, demonstrating protein responses to oxidative stress and the effect of maturation on the expression levels of GST isoforms. Recently, we have started a systematic quantitative proteome analysis of bovine embryonic stages (zygote to expanded blastocyst) using highly sensitive DIGE saturation labeling as well as quantitative nano-LC-MS/MS approaches tailored for the limited material available from embryos. First results disclosing dynamic proteome signatures in bovine 2-cell stage embryos and morulae as well as morulae and blastocysts will be presented. Relevant proteins detected in these experiments, among them YBX2, PCDP5, and IF2B3, were absolutely quantified using selected reaction monitoring as an antibody free mass spectrometry based protein quantification technique.

Practitioners' Forum

Recent Advances in Superovulation and Embryo Production

Rueben Mapletoft, University of Saskatchewan, Chairman

This two-hour session will focus on recent developments in embryo production, both in vivo and in vitro, and, in particular, using sexed semen. The objective of this forum is to provide practitioners and researchers with new tools for the production of embryos using the latest in research information. The session will begin with a review of new approaches to the synchronization of follicle wave emergence for superovulation and simplification of gonadotropin treatments in single- and split-injection protocols by Gabriel A. Bo [Institute of Animal Reproduction Cordoba (IRAC) and University of Villa Maria, Argentina]. This will be followed by a review of recent results on the use of sexed semen in superovulated *Bos indicus* donors by Pietro S. Baruselli and Manoel Sá Filho (University of Sao Paulo, Brazil). The forum will conclude with a presentation by Richard Remillard (Trans Ova Genetics, USA) on his experiences with the use of sexed semen in superovulated *Bos taurus* donors and in the production of embryos with in vitro techniques. There will be ample opportunity for questions, comments, and general discussion.

Session VII: Keynote Address

Nuclear Architecture in Developmental Biology and Cell Specialization

Thomas Cremer, Ludwig Maximilian University of Munich, Munich, Germany

Epigenome research pursues the goal of understanding how the diploid genome is able to regulate the development of an organism and orchestrate specific gene activities in hundreds of cell types. Progress made during the last few years has underlined the importance of understanding both local changes of chromatin packaging, i.e., the chromatin language, and the space–time dynamics of higher-order chromatin organization in cycling and postmitotic cells (5, 6, 8, 12, 13). The huge gap of knowledge, which must still be bridged from the molecular level to the level of higher-order structure, is emphasized by differences of currently discussed models of nuclear architecture (for reviews, see 1, 2, 10). Recent developments of super-resolution light optical microscopy beyond the classical Abbe/Raleigh limit and 3-D electron microscopy have provided new means to study the topography of nuclear structures at nanometer resolution (4, 9, 10, 11). Evidence obtained by state-of-the-art methods supports several conclusions. a) Chromosome territories, built up from interconnected chromatin domains (CD), are a basic feature of nuclear architecture in animals and plants. b) Major nuclear functions, such as transcription and DNA replication, take place in a region of condensed chromatin, located at the surface of CD and termed the perichromatin region (PR; 3, 7, 9, 10). The PR separates the transcriptionally inert interior of CD from the interchromatin network, a three-dimensional network of apparently DNA-free channels, which starts at nuclear pores and expands as between chromosome territories and CD. c) The interchromatin network contains splicing speckles and nuclear bodies, supplies functional proteins and protein complexes to the PR, and serves as a route for the nuclear import and export of proteins and RNA (10).

Preconference Symposium

Advances in Bovine Reproduction and Embryo Technology

Wyndham Orlando Resort, Orlando, Florida
Saturday, January 8, 2010

8:00 – 17:00

Introduction

Jose Santos, University of Florida; Cliff Lamb, University of Florida

Understanding the relationship between the follicle and embryo

Jo L. Leroy, University of Antwerp

Mechanism of uterine defense and control of uterine disease in cattle

Stephen Leblanc, University of Guelph

Controlling the dominant follicle

Milo Wiltbank, University of Wisconsin

Timed ET programs for management of donor and recipient cows

Pietro Baruselli, University of São Paulo

Influence of progesterone on oocyte quality and embryo development in cows

Pat Lonergan, University College Dublin

The role of cytokines and growth factors to improve pregnancy in IVF-ET programs

Jeremy Block, University of Florida

Dietary manipulations to improve embryonic survival in cattle

William Thatcher, University of Florida

What technologies are needed in the future of bovine reproduction and ET—Roundtable

Don Bennink, North Florida Holsteins; Brad Stroud, Embryo Service; Mel DeJarnette, Select Sires Inc.

Conclusion

Jose Santos, University of Florida; Cliff Lamb, University of Florida

Plasticity, Fate Control, and Therapeutic Applications of Domestic Animal Stem Cells

Wyndham Orlando Resort, Orlando, Florida
Saturday, January 8, 2010

13:00 – 18:00

Welcome and opening remarks

Fulvio Gandolfi, University of Milano

Production of Oct4/GFP transgenic pigs: A new large animal model for reprogramming

Heiner Niemann, Institut Fuer Tierzucht

Mechanical phenotyping of embryonic stem cells

Carol Keefer, University of Maryland

Development of porcine neural progenitor stem cells for studying and treating Alzheimer's disease

Vanessa Hall and Poul Hyttel, University of Copenhagen

Equine amniotic-derived stem cells: Progress and perspectives

Fausto Cremonesi, University of Milano

The multi-potentiality of skin-derived stem cells in pigs

Randall Prather and Mingtao Zhao, University of Missouri

Markers of stemness in equine mesenchymal stem cells

Ann Van Soom, Ghent University

Strategies for regeneration of the bone using porcine adult adipose-derived mesenchymal stem cells

Matt Wheeler, University of Illinois

Porcine cardiac progenitor cells: A promising biomedical model

Fulvio Gandolfi, University of Milano

Postconference Workshop

International Regulations and Requirements for the Import/Export of Reproductive Biomaterials: Embryos, Semen, and Tissues

*Sponsored by
The IETS Committee on Companion Animals, Non-Domestic and
Endangered Species (CANDES)*

Wednesday, January 12, 2011
Windham Orlando Resort, Orlando, Florida

The goal of this workshop will be to present and discuss the current status regarding biosafety issues when transporting biomaterials from CANDES as well as humans and livestock for use in biomedical research, and embryo production in vivo, in vitro and artificial insemination. IETS members and experts working at regulatory agencies and in relevant research will provide presentations that will cover a variety of topics that will include cloning and stem cell research. The workshop will cover issues such as the potential for disease transmission via reproductive biomaterials and methods to reduce those risks, the current status of international regulatory agencies in their biosafety guidelines for the import/export of these biomaterials and suggestions for research or actions to overcome some of the hurdles that currently hampers use of reproductive biomaterials in biomedical and conservation science research. No proceedings articles will be provided, however, the IETS Committee on CANDES will prepare a publication summarizing the results of the workshop in a 2011 issue of the Embryo Transfer Newsletter. The proposed topics and suggested speakers for the program are listed as follows:

Session I International regulations for the transport of embryos, semen, and tissues from domestic and non-domestic livestock

08:00 – 08:45 USDA-APHIS guidelines and regulations regarding the transport of reproductive tissues versus live animals, *Dr. Linda Penfold, White Oak Conservation Center, IETS CANDES Subcommittee Co-Chair; and Dr. William White, USDA-APHIS, Foreign Animal Disease Diagnostic Laboratory*

08:45 – 09:00 Discussion

09:00 – 09:45 OIE and international guidelines and regulations regarding the transport of reproductive tissues versus live animals, *Dr. Larry Delper, VM Agriculture Consulting Ltd., IETS Health and Safety Committee (HASAC) Regulatory Subcommittee Chair; and Dr. Pascale Chavatte-Palmer, INRA, IETS HASAC Chair*

09:45 – 10:00 Discussion

10:00 – 10:30 Break

10:30 – 11:15 Biosafety issues and mitigations regarding the use of tissues for cloning, *Dr. Irinia Polejaeva, Viagen Inc., IETS HASAC member; Dr. Kegin Gregg, Viagen Inc.; and Dr. Duane C. Kraemer, Texas A & M University, IETS CANDES member*

11:15 – 11:30 Discussion

11:30 – 12:15 Risks and methods for reducing risks of transmitting infectious pathogens when transporting reproductive biomaterials, *Dr. Ann Van Soom, Ghent University, IETS HASAC Research Subcommittee Chair; and Dr. Naida Loskutoff, Omaha's Center for Conservation and Research, IETS CANDES Chair*

12:15 – 12:30 Discussion

12:30 – 14:00 Lunch

Session II International guidelines and regulations for the import/export of reproductive tissues from rare or endangered livestock breeds and non-domestic species

14:00 – 14:45 Current trends and disease risk assessments for the development of biobanks for tissues from a diverse array of taxa, including rare domestic and non-domestic livestock, *Dr. Bill Holt, Zoological Society of London, IETS CANDES Health and Safety Co-Chair*

14:45 – 15:00 Discussion

15:00 – 15:30 CITES international guidelines and regulations regarding the transport of tissues from endangered species, *Dr. Mike Carpenter, US Fish and Wildlife Department, CITES Representative*

15:30 – 16:00 Break

16:00 – 17:00 Panel discussion with representatives from USDA-APHIS, IETS HASAC, US Fish and Wildlife Service and CITES

Moderators: *Dr. Gabriela Mastro Monaco, Toronto Zoo, Canada, IETS CANDES Technology Subcommittee Co-Chair; and Dr. Jason Herrick, University of Illinois, IETS CANDES Research Subcommittee Co-Chair*

Panel:

- *Dr. William White, USDA-APHIS, Foreign Animal Disease Diagnostic Laboratory;*
- *Dr. Larry Delver, VM Agriculture Consulting Ltd., IETS Health and Safety Committee (HASAC) Regulatory Subcommittee Chair;*
- *Dr. Pascale Chavatte-Palmer, INRA, IETS HASAC Chair;*
- *Dr. Ann Van Soom, Ghent University, IETS HASAC Research Subcommittee Chair;*
- *Dr. Mike Carpenter, US Fish and Wildlife Department, CITES Representative*

The focus will be on suggestions as to how to approach regulatory agencies for guidance to standardize regulatory requirements for reproductive biomaterial transport and for possible methods needed to relax certain regulations that currently affect biomedical and conservation research programs, similar to the OIE's acceptance of the Embryo Appendices in the Animal Health Code based on the efforts of the IETS HASAC.

Special Events

Open Meeting of the Health and Safety Advisory Committee

Sunday, January 9, 2011

18:00 – 20:00

Floral Ballroom

Welcome Reception

Sunday, January 9, 2011

20:00

Wyndham Orlando Resort

Open Meeting of the Domestic Animal Biomedical Embryology Committee

Monday, January 10, 2011

18:00 – 20:00 Floral Ballroom

Open Meeting of the Companion Animals, Non-Domestic and Endangered Species Committee

Monday, January 10, 2011

18:00 – 19:00 Azalea

Practitioners' Forum – Recent Advances in Superovulation and Embryo Production

Tuesday, January 11, 2011

10:30 – 12:30 Floral Ballroom

9th IETS Annual Running Competition

Tuesday, January 11, 2011

16:30 – 17:30

Meet near the registration desk. The course will take participants around the beautiful Wyndham Orlando Resort. We look forward to seeing you participate in this year's fun run.

Closing Party

Tuesday, January 11, 2011

19:00 – 2:00

Come and join us for some delicious food, conversation, and dancing. There will be music for all those wishing to stay late and dance.

Orlando Information and Attractions

A Universal Orlando Vacation Begins at the Wyndham Orlando Resort

Begin your **Universal Orlando vacation** in the original movie-based theme park, Universal Studios. Ride the thrilling Revenge of the Mummy Roller Coaster or watch, feel, and hear the action in the Shrek 4-D show. Continue on to Islands of Adventure, where you can experience innovative and cutting-edge rides, attractions, and shows. Come face to face with a T-Rex in Jurassic Park, or go on an immersive 3-D thrill ride with Spiderman. Be sure to check out the Hollywood Rip Ride Rocket opening this summer for your Universal Orlando vacation! Take your entire family out and learn about the mysteries of the sea at Sea World Orlando, and make a splash at the new Aquatica Waterpark. Experience the magic and make-believe at the Walt Disney World Resort, a short drive from the Wyndham Orlando Resort. Wonder, fantasy, and pixie dust abound in the Magic Kingdom, Epcot, Disney's Hollywood Studios, and Animal Kingdom. Come feel like a child again in this timeless place of endless possibilities. The Wyndham Orlando Resort is also the perfect Sea World Orlando hotel for guests looking for free transportation to local attractions such as Sea World, Universal, and Wet 'n Wild.

Plan an exciting Universal Orlando vacation to Universal Studios and Sea World and stay at this wonderful **Sea World Orlando hotel**. For assistance with transportation, tickets, directions, and more, **please visit the friendly staff at the Front Desk**. More information about Orlando is available at www.iets.org/2011.

Companion's Tour

There are several tours that can be organized during the annual conference. For more details, please contact the Wyndham Orlando Resort.

Orlando

The City Beautiful Welcomes You to a Tropical Orlando Resort Destination

Home of the Orlando Magic, championship golf courses, amazing shopping, world-class entertainment, theatres, museums, and lush tropical scenery.

Orlando Art and Culture

- Orlando Museum of Art – Houses local, regional, national, and international artwork
- Morse Museum of Art – World's most comprehensive collection of Tiffany glass
- Leu Gardens – Fifty acres of plush southern gardens
- Holy Land – Biblical museum and park

Orlando Entertainment and Sports

- Orlando Magic – Championship basketball team
- Championship golf courses
- Orlando Science Center – Inspiring curiosity and exploration in science, great kids activities
- Orlando Philharmonic Orchestra – Diverse musical programs for all audiences

REMINDER

Early registration deadline is November 28, 2010

*Looking for
that perfect job?*

*Looking for the
perfect employee?*

*Let IETS end your search at the Job Resource Center
at the 2011 Annual Conference in Orlando*

If you are looking for the perfect job, please bring 10 copies of your resume to the IETS annual conference in Orlando, Florida. Graduates, undergraduates, and professionals looking for a job are encouraged to participate. If you are unable to attend the conference but would like to participate in the Job Resource Center, please send your 10 resumes by December 1, 2010, to IETS Job Resource Center, 2441 Village Green Place, Champaign, IL 61822, USA.

If your company is looking for the perfect employee, please bring 10 copies of your position announcement including details such as qualifications and deadlines to the IETS annual conference in Orlando. Companies, universities, and government agencies are encouraged to participate. If you are unable to attend the conference but would like to participate in the Job Resource Center, please send your 10 position announcements by December 1, 2010, to IETS Job Resource Center, 2441 Village Green Place, Champaign, IL 61822, USA.

2011 MEETING SPONSORS

as of October 1, 2010

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FRIEND (up to \$1999)

