45th Annual Conference

Sheraton New Orleans Hotel
New Orleans, Louisiana
January 20–23, 2019

IETS
INTERNATIONAL EMBRYO TECHNOLOGY SOCIETY

Program Book

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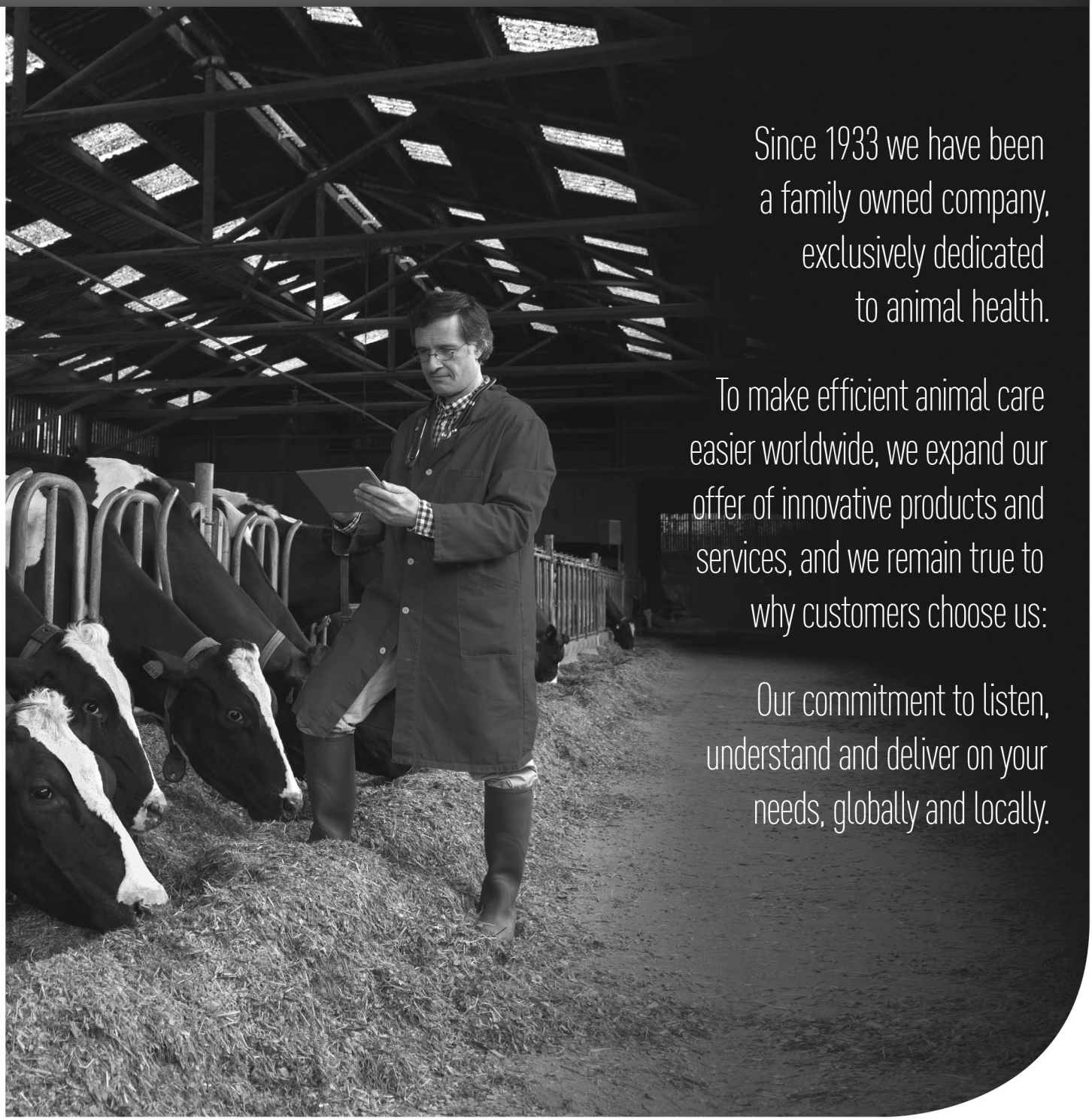

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Program Book

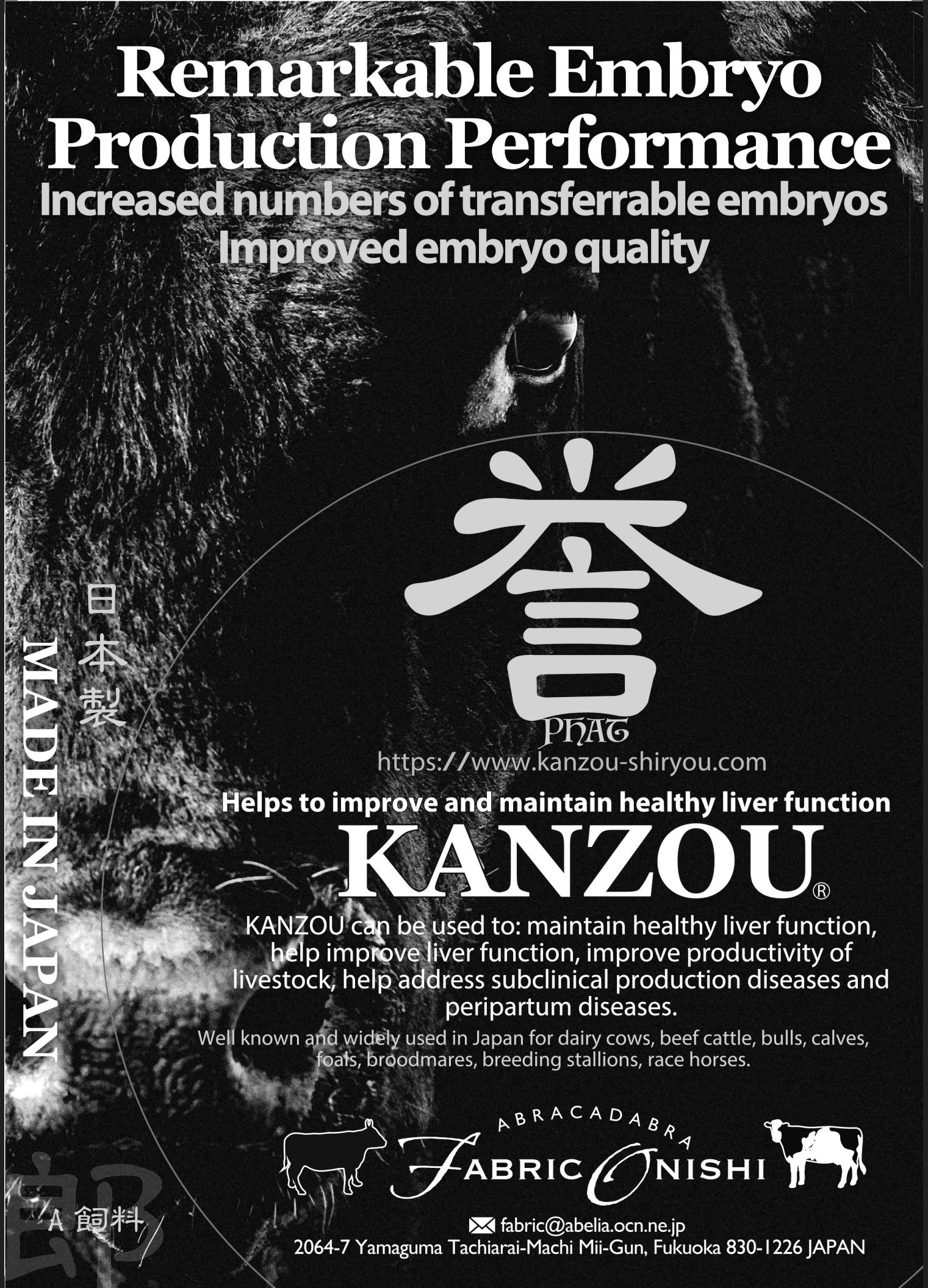
45th Annual Conference of the International Embryo Technology Society

Embryo Technology: Overcoming Nature's Challenges

INTERNATIONAL EMBRYO TECHNOLOGY SOCIETY

Sheraton New Orleans Hotel
New Orleans, Louisiana
January 20–23, 2019

Scientific Program Co-Chairs:
Gabriela F. Mastromonaco and Pietro S. Baruselli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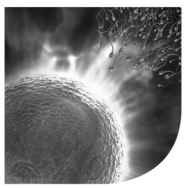

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Preface and Acknowledgments

The 45th annual meeting of the International Embryo Technology Society will be held at the Sheraton New Orleans Hotel, New Orleans, USA, from January 20 to 23, 2019. This year's program theme is **"Embryo Technology: Overcoming Nature's Challenges."** In the 50+ years that we have been developing and applying embryo technologies, progress has been challenged not only by limitations in knowledge, equipment, and techniques, but by the intrinsic biology of the species of interest. With this program, we hoped to highlight some of the specialized approaches that have been necessary to achieve success when faced with additional obstacles resulting from the animals' life histories. To fulfill our goal of sharing this knowledge with our society members, we have brought together a group of leading researchers who have been working to improve embryo technology outcomes under "nature's" constraints.

The 45th annual conference of the IETS is organized into five plenary sessions featuring 10 invited speakers who will provide in-depth overviews of various topics central to the main theme, supplemented with complimentary short oral presentations selected from the submitted abstracts. This year, the major topics include female donor age and anatomy, genetic background, reproductive seasonality, and cryosurvival. To complete the program, Dr. Patrick Lonergan, University College Dublin, Ireland, will give the keynote presentation titled "Embryo development in cattle and interactions with the reproductive tract." In addition, poster presentations will showcase recent advances in assisted reproductive technologies in food, laboratory, companion, and exotic animals.

We gratefully acknowledge the time and efforts of numerous people who have contributed to the organization of this year's meeting. The scientific program was complemented by the following sessions: preconference workshop, titled "*In vitro* embryo production technologies," organized by Dr. Ken Bondioli; DABE and Morulas preconference workshop, titled "State-of-the-art approaches in developmental and reproductive biology," organized by Dr. Jorge Piedrahita and Morulas Governor Beatriz Fernandez-Fuerte; Practitioners' Forum, titled "Recipient management," organized by Dr. Rainer Saner; and CANDES Forum organized by Dr. Gabriela Mastromonaco and Dr. Dragos Scarlet. We thank all of these organizers for helping us create an informative and well-rounded program. We also thank all the main session speakers and their co-authors, abstract authors, and participants of the student competition for providing excellent scientific material. This year, 225 abstracts were submitted and 209 were accepted for publication in the conference proceedings. We are most grateful for the assistance of the manuscript reviewers, section editors, and abstract reviewers as their efforts were needed during a time when many were hoping to be away on summer vacation. We thank Dr. Bianca Gasparrini for organizing the student competition and selecting the finalists. We would also like to thank the session co-chairs for helping to initiate discussions and the Morulas for providing the Morulas and Mentor Luncheon, and the Career Luncheon for the student members.

In the background of all the scientific planning, we acknowledge the efforts of our IETS president, Dr. Daniel Salamone, University of Buenos Aires, and the IETS Board of Governors and IETS Foundation for their role in helping to make the 2019 annual conference a success. We extend our sincere gratitude to the sponsors for their economic contributions, which make IETS 2019 possible; Dr. Graeme Martin, editor-in-chief, and Jenny Foster, publisher, of *Reproduction, Fertility and Development* for their help with the production of the conference proceedings; and the FASS editorial department for the production of the program booklets.

We cannot forget to mention our debt of gratitude to Debi Seymour, executive secretary of IETS, for her constant support and guidance during the past two years of preparations.

Thank you for joining us at the 45th Annual Conference of the IETS and contributing to science, friendship, and fun in New Orleans!

Looking forward to seeing you all there.

Gabriela Mastromonaco and Pietro Baruselli
2019 IETS Program Co-Chairs


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Recipient of the 2019 IETS Pioneer Award

Barry Bavister

The Pioneer Award is bestowed by the International Embryo Technology Society (IETS) to recognize individuals who have made seminal contributions to the development of embryo-based technologies.

Award Presentation: Wednesday, January 23, at 14:15

Previous Recipients

M.-A. Sirard (2018)

D. T. Armstrong (2018)

H. Niemann (2017)

C. E. Pope (2016)

K. H. S. Campbell (2015)

J.-P. Renard (2015)

W. W. Thatcher (2014)

J. Hahn (2013)

O. J. Ginther (2012)

I. Wilmut (2011)

R. J. Mapletoft (2010)

S. P. Leibo (2009)

G. Seidel Jr. (2008)

A. Iritani (2007)

D. Kraemer (2006)

S. Willadsen (2005)

B. Brackett (2004)

K. Betteridge (2003)

R. H. Foote (2002)

P. J. Dziuk (2001)

R. Yanagimachi (2000)

R. M. Moor (1999)

I. Gordon (1998)

S. Wintenberger-Torres (1997)

W. K. Whitten (1996)

C. R. Austin (1995)

N. W. Moore (1994)

R. G. Edwards (1993)

R. L. Brinster (1992)

A. K. Tarkowski (1991)

J. D. Biggers (1990)

C. Thibault (1989)

A. L. McLaren and D. Michie (1988)

E. J. C. Polge (1987)

T. M. Sugie (1986)

L. E. A. Rowson (1985)

L. E. Casida (1984)

M. C. Chang (1983)

R. O. Berry (1982)

Dr. Barry Bavister is the recipient of the International Embryo Technology Society (IETS) Pioneer Award. Bavister is one of the greatest scientists in reproductive biology and pioneered human *in vitro* fertilization in collaboration with Robert Edwards and Patrick Steptoe. Dr. Robert Edwards received the 2010 Nobel Prize in Physiology and Medicine for this remarkable achievement. Dr. Bavister's graduate research with Dr. Edwards discovered a key role for pH, showing how higher rates of fertilization could be obtained by simply increasing the alkalinity of the culture medium. His research was fundamental for the first successful *in vitro* fertilization (IVF), which led to the birth of Louise Brown, the world's first test-tube baby. Forty years after the first IVF baby, more than 8 million babies have been born.

Barry Bavister was born in 1943 and currently resides in New Orleans, Louisiana. He obtained his BA in physiology from the University of Cambridge in 1967 and a PhD from the Marshall Laboratory of Reproductive Sciences at the University of Cambridge in 1972. He received postdoctoral training with Professor Ryuzo Yanagimachi at the University of Hawaii. Bavister was a professor at the University of University of Wisconsin–Madison and an assistant professor at the Wisconsin Regional Primate Research Center for over 20 years. He became the Freeport-McMoRan Endowed Chair of Conservation and Reproductive Biology at the University of New Orleans in 2000.

Fertilization of the Human Egg Achieved at Last

Barry Bavister was Austin's first graduate student (1967–1972), trying to resolve the factors influencing the capacitation of hamster spermatozoa *in vitro*. In 1969 Bavister discovered the key role of pH in embryo culture, showing how higher rates of fertilization could be obtained by simply increasing the alkalinity of the media (Edwards, Bavister, and Steptoe, 1969). Robert Edwards shared the laboratory with Austin and recruited Bavister to his project. The culture media that Bavister had developed showed that human eggs and sperm could successfully be inseminated *in vitro*. In 1969 Edwards, Bavister, and Steptoe submitted the manuscript to *Nature* (Edwards, Bavister, and Steptoe, 1969). The *Nature* paper makes modest claims because only 18 of 56 eggs were assigned to the experimental group for *in vitro* fertilization and only two embryos with two pronuclei exhibited fertilization (Johnson, 2011).

According to Edwards (Edwards and Steptoe, 1980), Jean Purdy, a British nurse, drove to Edgeware General Hospital to collect

> "the last piece of ovarian tissue that I was to obtain from the Edgware General Hospital. It yielded me 12 human eggs. Those eggs were soon ripening in mixtures of culture medium I had used over many years to which some of Barry [Bavister]'s fluid had been added. Thirty-six hours later we judged that they were ready for fertilization."

Ten hours later, Edwards and Bavister returned to the laboratory late at night:

> "A spermatozoon was just passing into the first egg ... An hour later we looked at the second egg. Yes, there it was, the earliest stages of fertilization. A spermatozoon had entered the egg without any doubt—we had done it ... We examined other eggs and found more and more evidence. Some ova were in the early stages of fertilization with the sperm tails following the sperm heads into the depths of the egg; others were even more advanced with two nuclei—one from the sperm and one from the egg—as each gamete donated its genetic component to the embryo."

With the discovery with Professor R. G. "Bob" Edwards, they were able to fertilize human ova *in vitro*, leading to the first IVF birth of Louise Brown in 1978. Clearly, Barry Bavister, at the age of 25, was instrumental in the development of human IVF. The Nobel Prize in Physiology of Medicine 2010 was awarded to Robert G. Edwards "for the development of *in vitro* fertilization," and we recognize Barry Bavister as being one of the pioneers of this technology.

First Monkey IVF

Barry Bavister developed the first reliable procedures for IVF in monkeys in 1979, and the first genetically documented IVF monkey, "Petri," was born in 1983. Petri, aptly named for the glass dish in which he was conceived, was the world's first test-tube rhesus monkey. Arriving nearly five years after the birth of Louise Brown, the first human born through the technique of IVF, Petri was praised as an important primate research model to supply basic

information on IVF and embryogenesis. “Petri’s unremarkable existence should be a source of comfort for the hundreds of thousands of people whose lives began through IVF,” said Bavister. “The primary thing is his normality. It allays fears that somewhere down the road there would be problems,” he said, referencing concerns that somehow humans conceived through IVF, while seemingly normal at birth, might face developmental or reproductive problems later in life.

Petri, and two other male rhesus macaques conceived through IVF, live at the Wisconsin primate center. The monkeys have matured through puberty and sired healthy offspring through traditional means. Although humans born through IVF arrived on the scene years before the primate model, the compressed life spans of nonhuman primates make it possible to study mileposts of development and reproduction that IVF humans have yet to encounter. The average life span of rhesus macaques is 26, but those in captivity may live to be 40.

“Monkeys mature so much faster than humans,” said Bavister. In addition, rhesus macaques and humans are nearly the same at the genetic level, sharing a genome that is more than 90% identical. The IVF rhesus monkey model in the culture dish is excellent in terms of our understanding of the first phases of primate embryo development. It also is the best model for human perinatal physiology. Petri and his two test-tube companions at the Wisconsin primate center have successfully reproduced and alleviate concerns about the future reproductive success of humans conceived through IVF.

Bavister’s scientific contributions in early embryo development have been instrumental for successfully culturing eggs, sperm, and embryos in all reproductive systems. He showed that changes in intracellular pH are regulators of early mammalian embryo development; demonstrated that specific energy substrates and amino acids regulate embryo development, which provided the basis for the formulation of sequential culture media; provided the first evidence that timing of embryo development is critically important for viability; and showed that mitochondrial distribution or activity changes during fertilization and that these changes are perturbed in embryos that have poor or no developmental competence—artificially perturbing pH produces similar developmental and subcellular changes. His work promises to provide new insights into the relationships between embryos and their culture environment, leading to improved culture media formulations.

Bavister has authored or co-authored 251 refereed journal articles, plus 27 book chapters and proceedings of scientific meetings, and edited 3 books, all on the topics of gamete biology, *in vitro* fertilization, and embryo development. He has over 13,059 citations. He has served on numerous grant review panels for the National Institutes of Health and the US Department of Agriculture. His research was continuously funded by the US government from 1978 to 2011, with a total award amount of over $9 million.

Bavister has been an inspiration for all of us. His enthusiasm for science is also evident in the classroom. Bavister is a teacher for undergraduate students, graduate students, professors, and researchers. Bavister is quick witted, passionate, and engaging. For those who do not know him, he is happily retired and loves reading, traveling, boating, snorkeling, and scuba diving, and if you have a beer with him, he will tell you stories about his incredible journey as a scientist.

References

Edwards, R. G., B. D. Bavister, and P. C. Steptoe. 1969. Did fertilization occur? Nature 221:981–982.

Edwards, R. G., B. D. Bavister, and P. C. Steptoe. 1969. Early stages of fertilization in vitro of human oocytes matured in vitro. Nature 221:632–635.

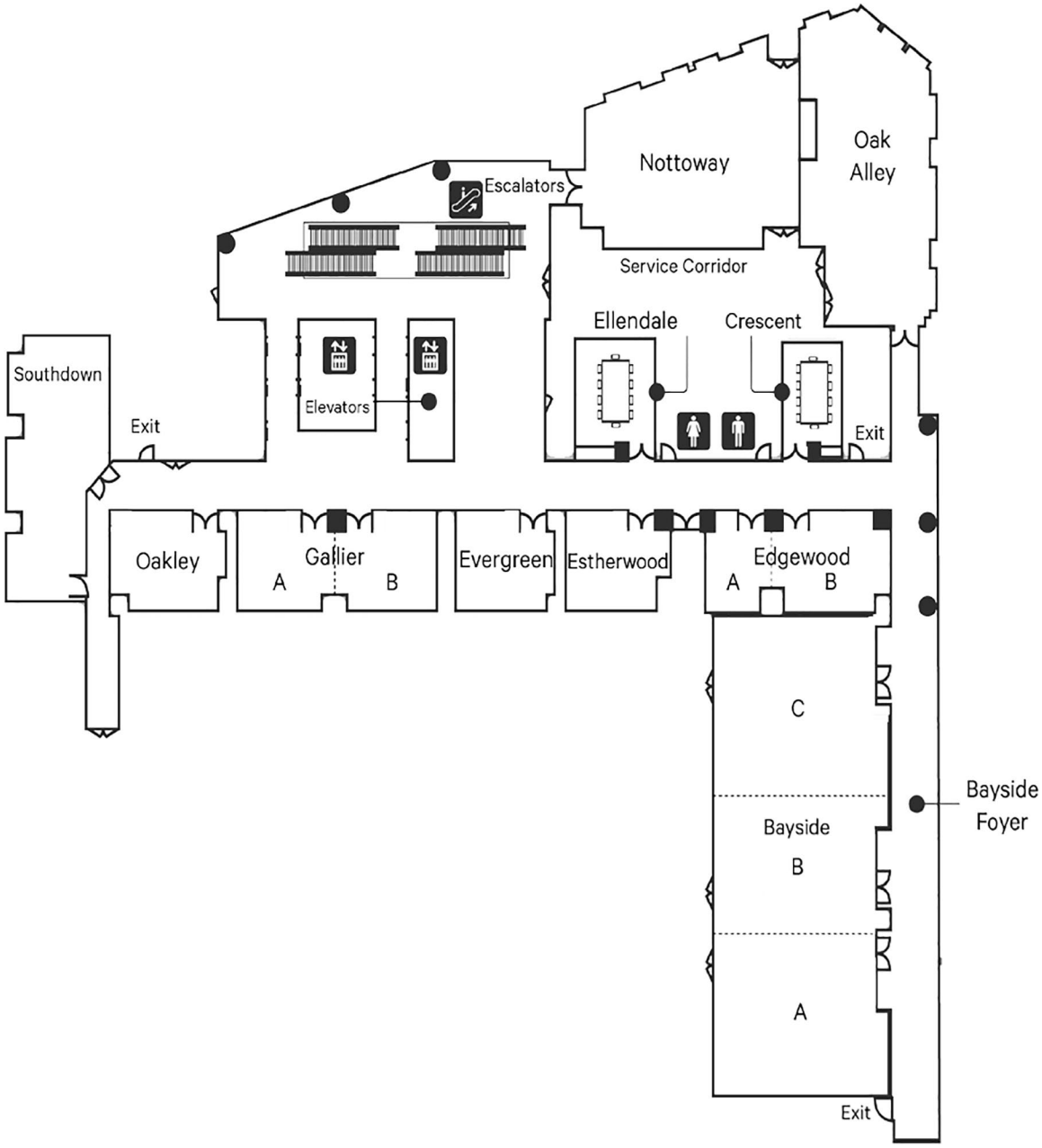
Edwards, R. G., and P. C. Steptoe. 1980. A Matter of Life: The Story of a Medical Breakthrough. Hutchinson, London, UK.

Johnson, M. H. and R. Edwards. 2011. The path to IVF. Reprod. Biomed. Online 23:245–262.

Map of the Venue

Sheraton New Orleans Hotel
500 Canal Street, New Orleans, Louisiana 70130

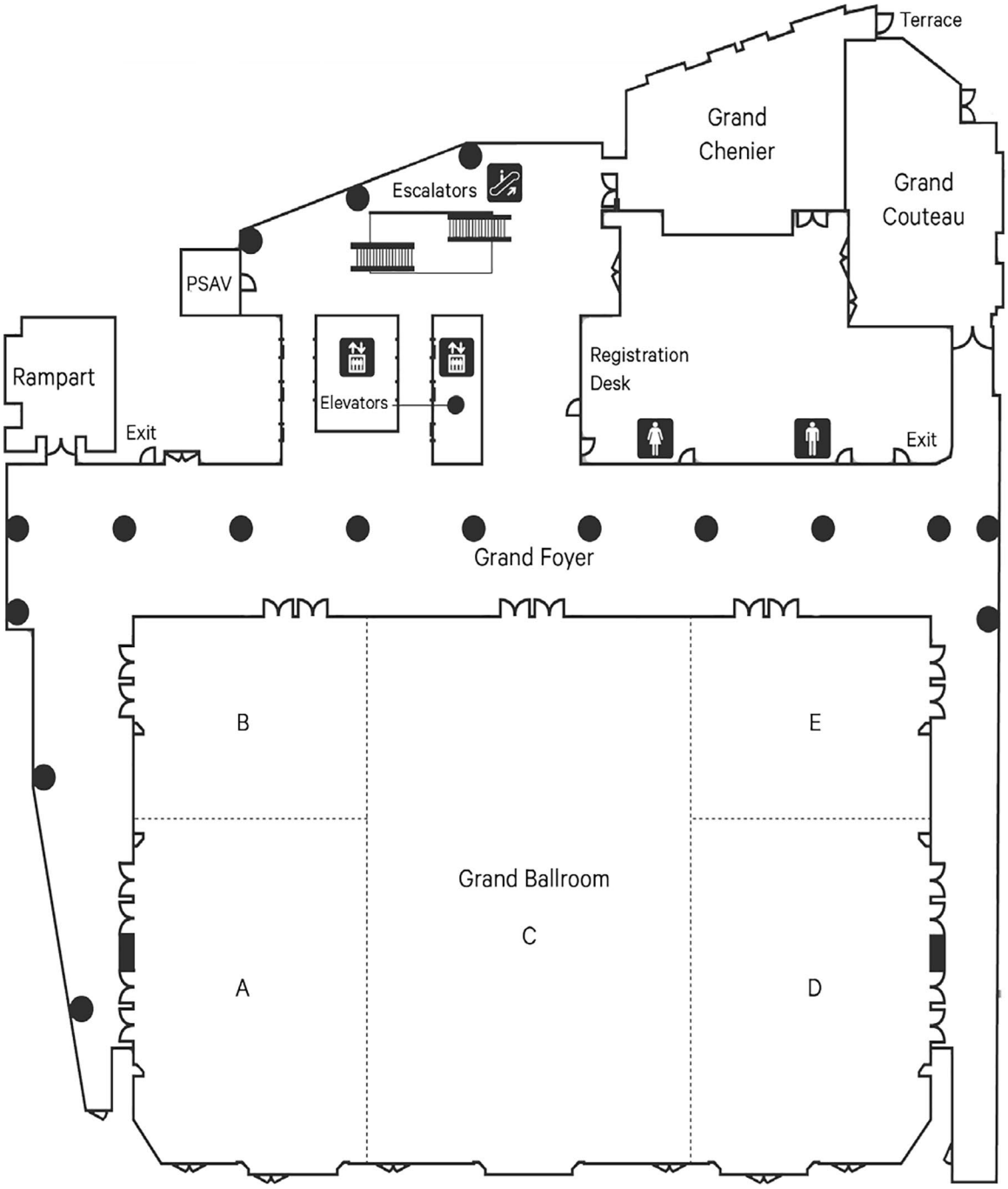
Meeting Space (Fourth Floor)



Map of the Venue

Sheraton New Orleans Hotel
500 Canal Street, New Orleans, Louisiana 70130

Meeting Space (Fifth Floor)



General Information

Meeting Room Directory

Main conference sessions	Grand Ballroom AB, Concurrent Sessions: Grand Couteau, CANDES Forum
Exhibits	Grand Ballroom CDE
Poster displays	Grand Ballroom CDE

Please see the Scientific Program for additional room assignments.

Registration Desk Hours

The registration desk is located in the Grand Foyer.

Pick-up of preregistration packets

Saturday, January 19	16:00–19:00

On-site registration hours

Sunday, January 20	07:00–18:00
Monday, January 21	07:00–18:00
Tuesday, January 22	07:30–16:00
Wednesday, January 23	08:00–15:00

Exhibit Information

Grand Ballroom CDE

Setup

Sunday, January 20	11:00–19:00

Exhibits open

Monday, January 21	09:00–19:00 18:00–19:00 (Reception)
Tuesday, January 22	09:00–17:00
Wednesday, January 23	08:30–13:00

Teardown

Wednesday, January 23	14:00–17:00

Details on the exhibitors can be found in the Exhibit Directory on page 54.

Badges

As a security requirement, we request that all participants wear their conference name badges to all sessions and social functions.

Certificates of Attendance and Presentation

A Certificate of Attendance will be included in your badge packet.

Currency

The dollar is the legal tender in the United States. Should you need to exchange your local currency, you will be able to make exchanges at the larger airports: Miami, Denver, Los Angeles, Atlanta, Dallas, or Houston.

Passport and Visa Information

As with all IETS meetings, we expect attendees from all over the world. **Please contact your embassy for visa/ passport requirements for entering into the United States to attend conferences.**

Climate

In January, daytime high temperatures tend to be mostly in the lower 60s °F (15–17°C), and overnight lows tend to average in the mid to upper 40s °F (7–9°C). A few of the warmer afternoons will see temperatures reaching or exceeding the lower 70s °F (22–23°C).

Registration Fees

All registration fees will be paid in US dollars or credit card purchases.

Messages

Any messages received for conference delegates will be posted on the message board located near the registration desk.

Refreshments

Morning and afternoon refreshments are included in your registration fee and are provided during the scheduled break times in the Exhibit area located in Grand Ballroom CDE.

Dining and Entertainment

With over 1,400 restaurants in New Orleans, there's something for everyone. Search https://www.neworleans.com/nola-eat/ for the best cuisine in the Crescent City. The Sheraton offers a taste of flavors of New Orleans when you savor the cuisine at Roux Bistro or toast to a successful day at the Pelican Bar.

Services and Amenities

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Program

Friday, January 18

08:00–17:00 IETS Board of Governors meeting (Grand Couteau)

Saturday, January 19

08:00–17:00 IETS Board of Governors meeting (Grand Couteau)
13:00–16:00 W3171 Committee Meeting (Grand Chenier)
16:00–19:00 Registration (Grand Foyer)

Sunday, January 20

07:00–18:00 Registration (Grand Foyer)
08:00–12:00 W3171 Committee Meeting (Edgewood AB)
08:15–18:30 **DABE, Morulas Preconference Symposium (Grand Ballroom A)**
State-of-the-Art Approaches in Developmental and Reproductive Biology
Program listing on page 64
07:30–17:30 **IETS/LSU AgCenter Research Preconference Symposium**
(Buses depart for the LSU AgCenter at 07:30)
In Vitro Embryo Production Technologies Workshop
Program listing on page 66
09:00–13:00 HASAC Research Subcommittee meeting (Evergreen)
14:00–18:00 HASAC Regulatory Subcommittee meeting (Evergreen)
11:00–19:00 Exhibitor and poster setup (Grand Ballroom CDE)
17:00–21:00 IETS Foundation Board of Trustees meeting (Gallier AB)

Monday, January 21

07:00–18:00 Registration (Grand Foyer)
07:00–08:30 Poster setup (Grand Ballroom CDE)
07:00–08:30 Past Presidents' Breakfast (Grand Couteau)
07:00–08:30 Graduate and Undergraduate Student Competition Presenters' Breakfast, with IETS Foundation Education Chair (Rampart)
09:00–19:00 **Exhibits** (Grand Ballroom CDE)
08:30–08:45 Opening and welcome (Grand Ballroom AB)

Session I: Life Stages (Grand Ballroom AB)

Session co-chairs: Christine Aurich, Vienna University of Veterinary Sciences, and Michael Campbell, Oklahoma State University

08:45–09:30 Maternal age affects oocyte developmental potential at both ends of the age spectrum
Rebecca Krisher, National Foundation for Fertility Research, USA

09:30–10:15 Antral follicle population in prepubertal and pubertal heifers
Marcelo Seneda, University of Londrina, Brazil

10:15–10:30 Selected short presentations
Follicular fluid anti-Müllerian hormone (AMH) concentration predicts juvenile ovine in vitro embryo development
J. E. Seccafien, J. M. Kelly, H. McGrice, D. O. Kleemann, K. L. Kind, and W. H. E. J. van Wettere (Abstract 74)*

10:30–11:00 Refreshment break/poster viewing and exhibits (Grand Ballroom CDE)

IETS Foundation Student Competition Presentations (Grand Ballroom AB)

Session chair: Bianca Gasparrini, Università degli Studi di Napoli Federico II

11:00–11:15 Whole-genome bisulfite sequencing of bovine gametes and *in vivo*-produced pre-implantation embryos
J. E. Duan, Z. Jiang, F. Alqahtani, I. Mandoiu, H. Dong, X. Zheng, S. L. Marjani, J. Chen, and X. C. Tian (Abstract 1)

11:15–11:30 Role of histone H3 lysine 9 trimethylation during bovine pre-implantation embryonic development
M. Navarro, C. Bluguermann, M. Von Meyeren, V. Bariani, C. Osycka, and A. Mutto (Abstract 2)

11:30–11:45 Embryo knockout efficiency improved when targeting ovine suppressor of cytokine signalling 2 with 2 small guide RNA
A. K. Mahdi, J. F. Medrano, and P. J. Ross (Abstract 3)

11:45–12:00 Induction of ovulation by kisspeptin in llamas
R. A. Carrasco, C. E. Leonardi, K. D. Hutt, J. Singh, and G. P. Adams (Abstract 4)

12:00–12:15 Gene expression analysis and DNA methylation patterns of porcine somatic cell nuclear transfer blastocysts with high and low incidence of apoptosis
L. Moley, R. Jones, R. Kaundal, A. Thomas, A. Benninghoff, and S. C. Isom (Abstract 5)

12:15–12:30 Decelerating embryo development? Characterisation of the uterine environment in European roe deer (*Capreolus capreolus*) during diapause
V. A. van der Weijden, A. R. Vegas, V. Milojevic, A. B. Regg, J. T. Bick, S. Bauersachs, G. J. Arnold, T. Fröhlich, P. Giesbertz, H. Daniel, B. Drews, and S. E. Ulbrich (Abstract 6)

12:30–14:00 Lunch break

12:30–14:00 IETS Board luncheon with affiliate society (Grand Couteau)

12:30–14:00 HASAC Manual and Certificates Subcommittee meeting (Oakley)

12:30–14:00 Morulas and Mentors Luncheon (Grand Chenier)

Session II: Anatomical Barriers (Grand Ballroom AB)

Session co-chairs: Pierre Comizzoli, Smithsonian Conservation Biology Institute, and Luis Henrique de Aguiar, Louisiana State University

14:00–14:45 Non-surgical embryo transfer in goats and sheep: the Brazilian experience
Jeferson Fonseca, Embrapa, Brazil

14:45–15:30 Practical application of laparoscopic oviductal artificial insemination for the propagation of domestic cats and wild felids
William Swanson, Center for Conservation and Research of Endangered Wildlife (CREW), USA

15:30–16:00 Refreshment break/poster viewing and exhibits (Grand Ballroom CDE)

16:00–16:45 Selected short presentations (Grand Ballroom AB)
First ovum pickup-*in vitro*-produced Lidia breed calves using Lidia breed recipients: Influence of age and state of the recipients and in vitro-produced embryos on pregnancy rates
G. Gamarra Lazo, D. Di Scala, S. Maunas, R. Chaubet, and S. Lacaze (Abstract 110)*

Effect of treatment with follicle-stimulating hormone on *in vitro* embryo production of Gyr (*Bos indicus*) calves, pubertal heifers and adult cows
F. M. Elliff, E. C. Guimarães, L. F. Féres, B. M. Bayeux, M. H. A. Colli, and P. S. Sampaio Baruselli (Abstract 132)*

Performance of color Doppler ultrasonography of the corpus luteum for pregnancy diagnosis in beef heifers with or without a controlled internal drug release at different days after fixed-time artificial insemination
S. R. Wellert, S. E. Battista, K. E. Brown, J. D. Kieffer, and A. Garcia-Guerra (Abstract 9)*

16:45–17:15 Distinguished Service Award (Grand Ballroom AB)

18:00–19:00 Welcome Reception (Grand Ballroom CDE)

Tuesday, January 22

07:30–16:00 Registration (Grand Foyer)

07:00–08:00 IETS Foundation organizational breakfast meeting (Oakley)

07:00–08:00 Affiliate Committee breakfast meeting (Evergreen)

09:00–17:00 **Exhibits** (Grand Ballroom CDE)

Session III: Genetics and Fertility (Grand Ballroom AB)

Session co-chairs: Sebastián Demyda Peyrás, National University of La Plata, and Ahmed Mahdi, University of California, Davis

08:00–08:45 Effects of nutrition and genetics on fertility in dairy cows
Álex Bach, Institute for Research and Technology in Agrifood (IRTS), Spain

08:45–09:30 Transcriptomics-genomics data integration and expression quantitative trait loci analyses in oocyte donors and embryo recipients for improving *in vitro* production of dairy cattle embryos
Haja Kadarmideen, Technical University of Denmark, Denmark

09:30–10:00 Selected short presentations
Effect of in vivo heat stress on DNA methylation and DNA hydroxymethylation of bovine oocytes
F. A. Diaz, E. J. Gutierrez, B. A. Foster, P. T. Hardin, and K. R. Bondioli (Abstract 114)*

Effect of a long-term, high-fat diet on metabolic health and oocyte quality of an outbred (SWISS) versus inbred (C57BL/6N) mouse strain
A. Smits, W. F. A. Marei, O. Mohey-Elsaeed, I. Pintelon, K. Moerloose, D. Ginneberge, and J. L. M. R. Leroy (Abstract 47)*

10:00–10:30 Refreshment break/poster viewing and exhibits (Grand Ballroom CDE)

10:00–12:00 **Poster session I** (Grand Ballroom CDE)

10:00–12:00 **Exhibits** (Grand Ballroom CDE)

12:00–13:30 IETS Data Retrieval Committee meeting (Oakley)

12:00–13:30 IETS Exhibitors' Luncheon with IETS Board of Governors (Southdown)

12:00–13:30 Morulas Career Luncheon (Grand Chenier)

12:00–13:30 ARC CNBP Luncheon (Invitation only) (Gallier AB)

Session IV: Seasonality (Grand Ballroom AB)

Session co-chairs: Karine Reynaud, National Veterinary School of Alfort, and Jacob Stewart, Virginia Tech

13:30–14:15 Effects of reproductive season on embryo development in buffalo
Bianca Gasparrini, Università degli Studi di Napoli Federico II, Italy

14:15–15:00 Role of melatonin on embryo viability in sheep
Alfonso Abecia, Universidad Zaragoza, Spain

15:00–15:30 Peter Farin Trainee Award Winners Presentations (Grand Ballroom AB)

15:30–16:00 Refreshment break/poster viewing and exhibits (Grand Ballroom CDE)

Concurrent Forum

16:00–18:00 Practitioners' Forum (Grand Ballroom AB)
Chair: Rainer Saner

Recipient Management
Practitioners will be in small groups for a discussion on the state of the art in recipient management.
Group discussion leaders: Rainer Saner, Switzerland; Gabriel Bo, Argentina; François Grand, Canada; Marja Mikkola, Norway; Hélène Quinton, France; Byron Williams, USA; Christine Wrenzycki, Germany; and Masashi Yamaguchi, Japan

Concurrent Forum

16:00–18:00 CANDES (Grand Couteau)
Chair: Gabriela Mastromonaco

16:00–16:15 Introduction and business update

16:15–17:00 Linking *ex situ* breeding initiatives with in situ reintroduction
Paul Marinari, Smithsonian Conservation Biology Institute, USA

17:00–17:15 CANDES Trainee Award
Insights from roe deer oocyte transcriptome across embryonic diapause
Sandra Bernal-Ulloa, ETH Zurich, Switzerland (Abstract 107)

17:15–17:30 Basal and maximal oxygen consumption of oocytes from young and old mares
Giovana Di Donato Catandi, Colorado State University, USA (Abstract 167)

17:30–17:45 Reproductive cycle and pregnancy monitoring in the common hippopotamus (*Hippopotamus amphibius*) through salivary steroid analyses and transabdominal ultrasonography
Jessye Wojtusik, Cincinnati Zoo and Botanical Garden, USA (Abstract 100)

17:45–18:00 Comparative study between slow freezing and vitrification on the survival rate of cryopreserved alpaca embryos post-transfer
H. William Vivanco-Mackie, Vivanco International S.A.C., Peru (Abstract 112)

18:00–18:30 **IETS Business Meeting** (Grand Ballroom AB)
18:30–19:30 HASAC open meeting (Grand Ballroom AB)
18:30–19:30 Morulas' Trainee Forum (Grand Couteau)

Wednesday, January 23

07:30–08:30 Organizational meeting of the IETS Board of Governors (Evergreen)
08:00–15:00 Registration (Grand Foyer)
08:30–13:00 **Exhibits** (Grand Ballroom CDE)

Session V: Low Temperatures (Grand Ballroom AB)

Session co-chairs: Erdoğan Memili, Mississippi State University, and Beatriz Fernandez-Fuentes, University of Girona

08:30–09:15 Cryopreservation and microfluidics: A focus on the oocyte
Gary Smith, University of Michigan, USA

09:15–10:00 Update on the vitrification of bovine oocytes and *in vitro*-produced embryos
Teresa Mogas, Universitat Autònoma de Barcelona, Spain

10:00–10:30 Selected short presentations
Vitrification of prepubertal lamb spermatogonia using a novel vitrification system
S. Ledda, S. Pinna, S. Nieddu, D. Natan, A. Arav, and D. Bebbere (Abstract 38)*

Survival rates of vitrified biopsied bovine in vitro-produced blastocysts using the VitTrans device
N. González, J. Scherzer, M. Reichenbach, C. Otzdorff, and H. Zerbe (Abstract 24)*

10:30–11:00 Refreshment break/poster viewing and exhibits (Grand Ballroom CDE)
10:30–12:30 **Poster session II** (Grand Ballroom CDE)
12:00–13:00 Fun Run (meet in Sheraton Hotel lobby)
12:30–14:00 2019, 2020, 2021 IETS Program Committee lunch (Grand Chenier)
12:30–14:00 Poster takedown (Grand Ballroom CDE) **All posters must be removed by 14:00. Posters not removed by 14:00 will be discarded.**
14:00–17:00 Commercial exhibit takedown (Grand Ballroom CDE)

14:15–14:45 Pioneer Award (Grand Ballroom AB)

Session VI: Keynote Lecture (Grand Ballroom AB)

Session chair: Daniel Salamone, University of Buenos Aires

14:45–15:45 Embryo development in cattle and interactions with the reproductive tract
Pat Lonergan, University College Dublin, Ireland

Awards Presentation and Updates (Grand Ballroom AB)

15:45–16:15 IETS Foundation Early Career Achievement Award Winner
16:15–16:45 IETS Foundation Student Competition Awards; CANDES, DABE, and HASAC updates
16:45–17:00 Closing ceremony (Grand Ballroom AB)
19:00–23:00 Closing party (Sheraton New Orleans Hotel, Armstrong Ballroom and Foyer, and Orpheus)

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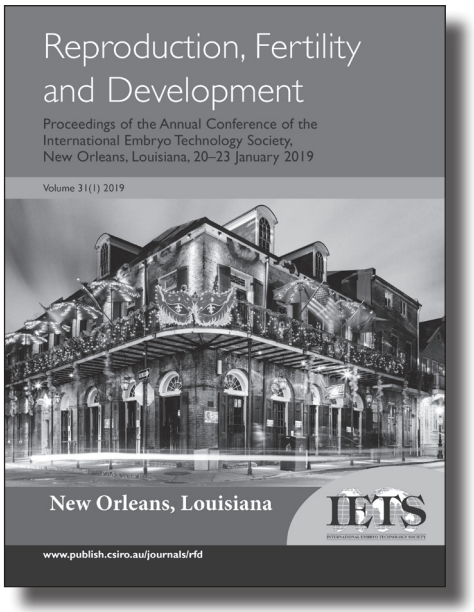

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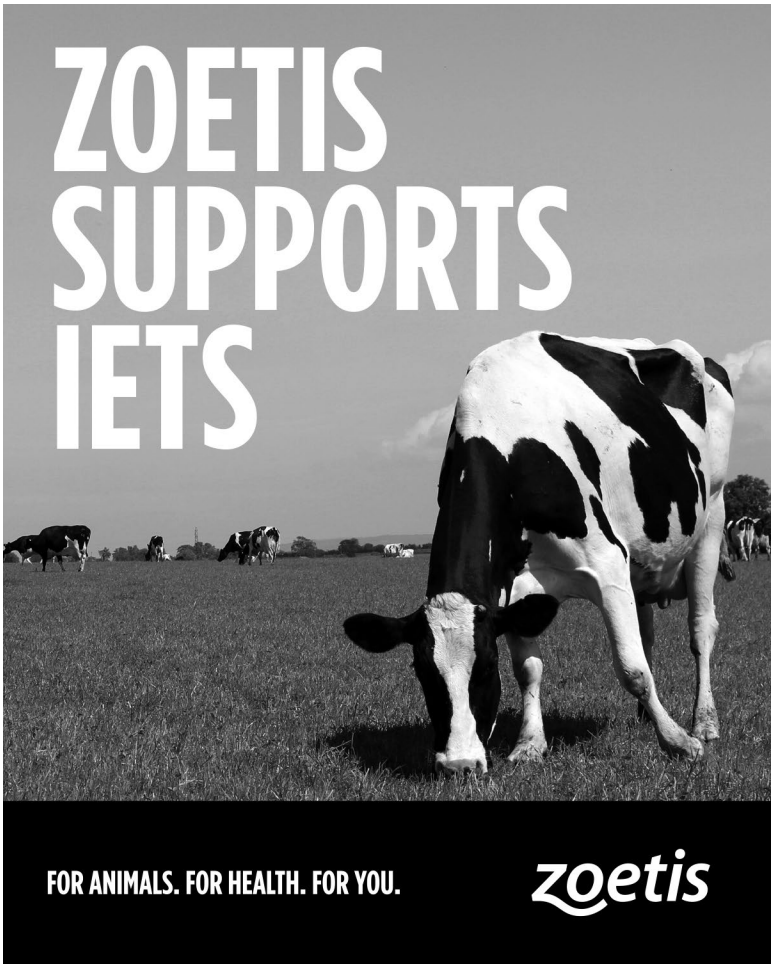
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The Program Co-Chairs Acknowledge and Thank the Following People

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Bianca Gasparrini, *Student Competition*
Joao Bastista Borges, *Artificial Insemination*
Daniel Salamone, *Cloning/Nuclear Transfer*
Pierre Comizzoli, *Cryopreservation/Cryobiology*
Peter Hansen, *Developmental Biology*
Pat Lonergan, *Early Pregnancy/Pregnancy Recognition*
Alfonso Gutiérrez-Adán, *Embryo Culture*
Gabriel Bo, *Embryo Manipulation*
Jeremy Block, *Embryo Transfer*
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Katrin Hinrichs, *Sperm Injection*
Tiziana Brevini, *Stem Cells*
Osamu Dochi, *Superovulation*
Carol Keefer, *Transgenesis*
Bianca Gasparrini, *Undergraduate Poster Competition*

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Milo Wiltbank
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Ahmed Yehia Gad
Koji Yoshioka
Carly Young

Poster Session Information

Location

Posters are located in the Grand Ballroom CDE of the Sheraton Hotel on the fifth floor level (see map on page 7).

Poster Numbers

Posters are identified by the number corresponding to the abstract number in *Reproduction, Fertility and Development* 2019; 31 (1). Numbering of the posters begins at 1 and ends at 209.

Setup

Posters can be put up from 11:00 to 19:00 on Sunday, January 20, and from 07:00 to 08:30 on Monday, January 21. **They will remain up until 12:30, Wednesday, January 23.**

Poster Session I

Presentations by authors of odd-numbered abstracts (e.g., 7, 9, 11) in *Reproduction, Fertility and Development* 2019; 31 (1) as well as the Student Competition finalist and Undergraduate finalist poster presentations will take place Tuesday, January 22, from 10:00 to 12:00. Odd-numbered posters for the poster competition will also be judged on Tuesday, January 22, from 10:00 to 12:00.

Poster Session II

Presentations by authors of even-numbered abstracts (e.g., 8, 10, 12) in *Reproduction, Fertility and Development* 2019; 31 (1) will take place Wednesday, January 23, from 10:30 to 12:30. Even-numbered posters for the poster competition will be judged on Wednesday, January 23, from 10:30 to 12:30.

Teardown

Poster teardown for the even-numbered posters will take place from 12:30 to 14:00 on Wednesday, January 23. **Posters that are not taken down by 14:00 on Wednesday will be discarded.**

Poster Session Order by Topic

Poster number = abstract number in *Reproduction, Fertility and Development* 2019; 31 (1)

Student Competition

1 Whole-genome bisulfite sequencing of bovine gametes and *in vivo*-produced pre-implantation embryos
J. E. Duan, Z. Jiang, F. Alqahtani, I. Mandoiu, H. Dong, X. Zheng, S. L. Marjani, J. Chen, and X. C. Tian

2 Role of histone H3 lysine 9 trimethylation during bovine pre-implantation embryonic development
M. Navarro, C. Bluguermann, M. Von Meyeren, V. Bariani, C. Osycka, and A. Mutto

3 Embryo knockout efficiency improved when targeting ovine suppressor of cytokine signalling 2 with 2 small guide RNA
A. K. Mahdi, J. F. Medrano, and P. J. Ross

4 Induction of ovulation by kisspeptin in llamas
R. A. Carrasco, C. E. Leonardi, K. D. Hutt, J. Singh, and G. P. Adams

5 Gene expression analysis and DNA methylation patterns of porcine somatic cell nuclear transfer blastocysts with high and low incidence of apoptosis
L. Moley, R. Jones, R. Kaundal, A. Thomas, A. Benninghoff, and S. C. Isom

6 Decelerating embryo development? Characterisation of the uterine environment in European roe deer (*Capreolus capreolus*) during diapause
V. A. van der Weijden, A. R. Vegas, V. Milojevic, A. B. Rüegg, J. T. Bick, S. Bauersachs, G. J. Arnold, T. Fröhlich, P. Giesbertz, H. Daniel, B. Drews, and S. E. Ulbrich

Artificial Insemination

7 Pregnancy rates in suckled beef cows synchronized with a shortened progesterone/oestradiol-based protocol (J-Synch) and inseminated with conventional or sexed-sorted semen
G. A. Bo, E. E. Huguenine, J. J. de la Mata, R. L. R. de Carneiro, and A. Menchaca

8 Evaluation of puberty induction protocol in peripubertal beef heifers prior to fixed-time AI programs
J. B. S. Borges, D. S. V. Luiz, P. R. L. Aguiar, C. G. B. Berlitz, G. S. Velho, C. R. Oliveira, B. M. Guerreiro, B. G. Freitas, and A. G. C. Dalto

9 Performance of color Doppler ultrasonography of the corpus luteum for pregnancy diagnosis in beef heifers with or without a controlled internal drug release at different days after fixed-time artificial insemination
S. R. Wellert, S. E. Battista, K. E. Brown, J. D. Kieffer, and A. Garcia-Guerra

10 Effect of 1 or 2 doses of prostaglandin in a resynchronization protocol for timed artificial insemination in beef cows
G. A. Pessoa, A. P. Martini, A. P. Baioco, E. F. Machado Filho, H. F. Pinto, G. W. Carloto, M. F. Sá Filho, I. Claro Junior, and N. Alves Neto

11 Conception rate of high-producing dairy cows at first service using prostaglandin $F_{2\alpha}$ and oestradiol benzoate
M. Yamaguchi, M. Takayama, H. López, and O. Dochi

12 Effect of additional prostaglandin F_{2a} during the Ovsynch protocol applied in different postpartum intervals in lactating dairy cows: Preliminary results
A. Bover, J. Casellas, and T. Mogas

13 Evaluation of PG-3-G presynchronization in Ovsynch-P programs in lactating dairy cows: Preliminary results
G. S. Velho, C. R. Oliveira, C. G. B. Berlitz, D. S. V. Luiz, M. F. C. Chaiben, A. G. C. Dalto, and J. B. S. Borges

14 Sperm membrane integrity in ejaculates from young bulls may be improved by single-layer centrifugation
E. Hurri, A. Johannisson, I. Lim-Verde, and J. M. Morrell

15 The effect of different bovine oocyte recovery methods on oocyte ultrastructure pre- and post-*in vitro* maturation
B. A. Foster, E. J. Gutierrez, and K. R. Bondioli

16 False-positive rate after anticipation of early pregnancy diagnosis for resynchronization of ovulation in *Bos indicus* heifers
L. M. S. Simões, E. A. Lima, A. P. C. Santos, R. E. Orlandi, M. P. Bottino, P. H. A. Marinho, L. A. Scandiuzzi Junior, J. P. M. Massoneto, A. H. Souza, P. S. Baruselli, and J. N. S. Sales

Cloning/Nuclear Transfer

17 Effect of the zona-free aggregation on the developmental competence of kodkod (*Leopardus guigna*) embryos generated by interspecies somatic cell nuclear transfer
D. Veraguas, C. Aguilera, D. Echeverry, D. Saez-Ruiz, F. O. Castro, and L. Rodriguez-Alvarez

18 Characterisation of early embryonic cellular defects after somatic cell nuclear transfer in fish
C. Rouillon, A. Depincé, N. Chenais, P.-Y. Le Bail, and C. Labbé

19 Success of handmade cloning in a commercial setting
T. Waybright, S. Sonsteby, and G. Vajta

20 Generation of myostatin knockout horse embryos using clustered regularly interspaced short palindromic repeats/CRISPR-associated gene 9 and somatic cell nuclear transfer
G. Vichera, D. Viale, R. Olivera, V. Arnold, A. Grundnig, J. Baston, S. Miriuka, and L. Moro

Cryopreservation/Cryobiology

21 Effect of egg yolk extracted low-density lipoprotein on cryopreserved Nguni bull semen
M. M. Tshabalala, K. A. Nephawe, M. L. Mphaphathi, C. M. Pilane, and T. L. Nedambale

22 Vitrification of bovine embryo using antifreeze polyamino acid
T. Fujikawa, Y. Gen, S.-H. Hyon, and C. Kubota

23 Viability staining techniques for cryopreserved spermatozoa in 3 caudata species
A. Gillis, K. Counsell, A. Julien, R. Marcec, A. Kouba, and C. Vance

24 Survival rates of vitrified biopsied bovine *in vitro*-produced blastocysts using the VitTrans device
N. González, J. Scherzer, M. Reichenbach, C. Otzdorff, and H. Zerbe

25 Cryopreservation of horse testicular tissue as a model for rhinoceros
M. C. Gómez, A. Alrashed, C.-Y. Su, and B. Durrant

26 Season affects cryotolerance of *in vitro*-produced buffalo embryos
M. A. Kosior, E. Parente, F. Salerno, K. Annes, R. Annunziata, G. Albero, G. Zullo, and B. Gasparrini

27 Effects of the caspase inhibitor benzyloxycarbonyl-Val-Ala-Asp-fluoromethyl ketone on frozen-thawed bovine sperm
C. De Canditiis, N. Pagano, V. Longobardi, C. Zuchegna, M. A. Kosior, R. Annunziata, E. Parente, and B. Gasparrini

28 Effect of deuterium oxide on bovine oocyte cryotolerance
F. Salerno, M. Rubessa, B. Gasparrini, and M. Wheeler

29 Development and survival of bovine vitrified sexed IVF-derived embryos *in vitro* matured with pituitary or human recombinant follicle-stimulating hormone
L. B. Ferré, C. Fresno, M. E. Kjelland, and P. J. Ross

30 Bull sperm kinetics after semen cryopreservation in extender containing propagermanium
T. E. Cruz, A. Martins Jr., F. N. Marqui, D. G. Souza, T. I. H. Berton, and E. Oba

31 Effect of fetal calf serum on production and cryotolerance of *in vitro* bovine embryos from Ecuadorian creole heifers
M. S. Méndez, M. E. Soria, L. R. Galarza, F. P. Perea, and D. E. Argudo

32 Vitrification of *in vitro*-matured bovine oocytes in triacetate cellulose hollow fibers
E. V. Kornienko, A. B. Romanova, M. A. Ikonopistseva, and G. P. Malenko

33 Caffeine improves equine sperm motility after thawing
M. A. Lagares, N. C. Alves, A. L. A. Guimaraes, S. B. Luz, S. A. Diniz, A. M. Q. Lana, and R. Stahberg

34 The effect of dilution method of beagle dog semen on the survival rate of cryopreserved spermatozoa after thawing
S. W. Kim, C.-L. Kim, I. S. Jeon, Y. G. Ko, and I.-S. Hwang

35 The effect of fatty acid-free BSA supplementation on the ability of low-temperature-preserved chicken semen
S. W. Kim, C. Kim, I. S. Jeon, and Y. G. Ko

36 The effects of E-64 on the developmental competence of porcine oocytes vitrified at the germinal vesicle stage
T. Somfai, H. T. Nguyen, N. T. Men, T. Q. Dang-Nguyen, H. Kaneko, J. Noguchi, T. Nagai, and K. Kikuchi

37 Viability of sheep skin fibroblasts after vitrification
Y. Toishibekov, E. Asanova, M. Yermekova, A. Seisenbayeva, and D. Toishybek

38 Vitrification of prepubertal lamb spermatogonia using a novel vitrification system
S. Ledda, S. Pinna, S. Nieddu, D. Natan, A. Arav, and D. Bebbere

39 General motility and mitochondrial cytochemical activity of post-thawed semen of pasture-fed Nelore bulls supplemented with palm and soybean oils
P. P. Tsuneda, L. K. Hatamoto-Zervoudakis, T. F. Motheo, J. T. Zervoudakis, and M. Nichi

Developmental Biology

40 Toward a standardised annotation of morphokinetical parameters for an automatic early prediction of the *in vitro* development potential of bovine embryos
A. P. Reis, G. Brocart, M. Belghiti, N. Le Brusq, S. Messoudi, B. M. Le Guienne, L. Laffont, S. Ruffini, E. Canon, P. Adenot, V. Duranthon, and A. Trubuil

41 Delineating the molecular connections between mitotic aneuploidy, micronucleation, and cellular fragmentation in pre-implantation bovine embryos
K. E. Brooks, B. L. Daughtry, S. S. Fei, M. Y. Yan, B. Davis, L. Carbone, and S. L. Chavez

42 Nrf2 and nuclear factor kappa B cross-talk in bovine granulosa cells under lead challenge
H. S. Aglan, S. Gebremedhn, D. Salilew-Wondim, C. Neuhoff, E. Tholen, E. Held, M. Hoelker, K. Schellander, and D. Tesfaye

43 Effect of early life nutrition on endometrial gland development and endometrial gene expression in heifers
S. Bagés-Arnal, B. Fernández-Fuertes, C. Passaro, C. Maicas, M. McDonald, C. J. Byrne, T. Martins, A. K. Kelly, D. A. Kenny, T. Fair, and P. Lonergan

44 Misregulation of ten-eleven translocation 3 CXXC domain leads to abnormal formation of 5-hydroxymethylcytosine and expression of pluripotency genes in pig embryos
K. Uh, J. Ryu, H. Miko, K. Carey, and K. Lee

45 The role of *TRIM28* in porcine somatic cell nuclear transfer embryo development
Y. H. Zhai, X. L. An, Z. R. Zhang, S. Zhang, and Z. Y. Li

46 Morphologic and functional characterization of the early fetal equine gonads
D. Scarlet, I. Walter, S. Handschuh, R. Ellerbrock, I. Canisso, and C. Aurich

47 Effect of a long-term, high-fat diet on metabolic health and oocyte quality of an outbred (Swiss) versus inbred (C57BL/6N) mouse strain
A. Smits, W. F. A. Marei, O. Mohey-Elsaeed, I. Pintelon, K. Moerloose, D. Ginneberge, and J. L. M. R. Leroy

48 Different chromatin accessibility in murine male and female inner cell mass
E. Ruggeri, E. Grow, X. Liu, A. Donjacour, and P. Rinaudo

Early Pregnancy

49 Collection of Day 7 equine embryos in aluteal cycles in mares
C. K. Mak, V. Medina, M. Markle, and C. R. F. Pinto

50 Equine uterine fluid proteome on the fifth day after ovulation
D. J. Lancheros-Buitrago, P. Rodriguez-Villamil, J. W. Gregory, C. A. Camacho-Rozo, J. E. Caballeros-Haeussler, N. Cazales, H. B. A. Bastos, E. Barros, A. M. Pimentel, and R. C. Mattos

51 Effects of modulating early luteal phase progestin concentration on endometrial function in early pregnant mares
C. Aurich, T. Beyer, and D. Scarlet

52 Decellularization of goat uterus as a promising 3-dimensional homing matrix of biological scaffold: A pilot study
M. Ghiringhelli, N. Verdile, T. A. L. Brevini, and F. Gandolfi

53 Pre-implantation exposure to bisphenol A and 4-*tert*-octylphenol result in disruption of calcium channels
D. N. Tran, J.-H. Lee, Y.-M. Yoo, E.-M. Jung, C. Ahn, S. Y. Park, B. Lee, B.-H. Jeon, T. H. T. Nguyen, and E.-B. Jeung

54 Altrenogest supplementation during early pregnancy improves swine embryonic development
B. Muro, R. Carnevale, M. Mendonça, D. Leal, M. Torres, D. Nakasone, G. Ravagnani, C. Martinez, M. Monteiro, S. Martins, and A. Andrade

55 Peri-conceptional undernourishment perturbs offspring sperm methylome
P. Toschi, E. Capra, D. Anzalone, F. Turri, F. Pizzi, B. Lazzari, A. Stella, P. Ajmone-Marsan, and P. Loi

56 Spatial analysis of transcriptome changes in porcine endometrium on Day 14 of pregnancy
S. Zeng and S. Bauersachs

57 Non-targeted metabolomic profiles within the uterine milieu of porcine pregnancies containing populations of uniform or diverse spherical, ovoid, or tubular conceptuses during initiation of embryo elongation
J. Miles, E. Wright-Johnson, S. Walsh, C. Corey, L. Yao, L. Rempel, and A. Pannier

58 Transcervical transfer of blastocysts reveals detrimental effect on implantation rate in di(2-ethylhexyl) phthalate-exposed mice
L. Y. Parra-Forero, A. Mojica-Villegas, E. Alfaro-Pedraza, and I. Hernández-Ochoa

Embryo Culture

59 Effect of amniotic progenitor cell microvesicles on freezing of *in vitro*-produced bovine embryos and on pregnancy rate after embryo transfer
A. Lange-Consiglio, V. Ossola, A. Girani, A. Quintè, and F. Cremonesi

60 Quercetin protects bovine pre-implantation embryos against oxidative stress via activation of Nrf2 signaling pathway
O. Khadrawy, S. Gebremedhn, D. Salilew-Wondim, F. Rings, C. Neuhoff, E. Tholen, E. Held-Hoelker, M. Hoelker, K. Schellander, and D. Tesfaye

61 Extracellular vesicles from serum in culture media are internalized by bovine embryos produced *in vitro*
B. Melo-Baez, E. Mellisho, and L. Rodriguez-Alvarez

62 Sequential nutrient restriction and provision during bovine *in vitro* embryo culture differentially affect blastocyst development and quality with oocytes from varied sources
R. Pasquariello, Y. Yuan, D. Logsdon, J. Becker, L. Yao, C. Broeckling, W. B. Schoolcraft, J. P. Barfield, and R. L. Krisher

63 Bovine embryo-secreted microRNA-30c negatively regulates cell cycle progression through downregulation of CDK12
X. Lin, E. Beckers, S. Mc Cafferty, J. P. Catani, K. J. Szymanska, A. Van Soom, and L. Peelman

64 Culture of bovine oocytes and embryos with metabolic hormones concentrations associated with equine metabolic syndrome
D. Bresnahan and E. Carnevale

65 Improvement of bovine early embryo development *in vitro* by coculture with endometrial epithelial cells
M. Sponchiado, W. F. A. Marei, P. E. J. Bols, M. Binelli, and J. L. M. R. Leroy

66 Bovine corpus luteum affects embryo developmental competence and production
J. M. Alvarado, M. A. Tenemaza, S. L. Merchán, D. E. Argudo, M. S. Méndez, M. E. Soria, L. R. Galarza, L. Ayala, H. J. Hernández, and F. P. Perea

67 Optimizing a protocol for isolating extracellular vesicles from medium conditioned by bovine embryos *in vitro*
K. C. Pavani, A. Hendrix, B. Leemans, and A. Van Soom

68 Flux analysis of aerobic glycolysis in bovine blastocysts and CT1 cells
J. Chung, R. Clifford, G. Sriram, and C. Keefer

69 Cloned bovine embryonic development derived from interferon tau knockout cells
K.-M. Kim, S.-J. Lee, S.-Y. Yum, H.-S. Kim, H.-J. Kim, J.-H. Park, J.-H. Lee, S.-H. Koo, W.-W. Lee, W.-S. Lee, and G. Jang

70 Does the addition of docosahexaenoic acid to *in vitro* systems during culture improve the quality of bovine embryos?
J. A. Sánchez Viafara, G. Lopez de Vasconcelos, R. Maculan, N. Gomes Alves, and J. Camisão de Souza

71 Removal of hypotaurine from porcine embryo culture medium decreases message for pro-apoptotic genes but does not affect development at low oxygen tension
P. R. Chen, E. C. Leffeler, L. D. Spate, and R. S. Prather

72 Effect of incubation temperature and of CO_2 concentration during early cleavage on equine *in vitro* embryo production
J. Brom-de-Luna, R. Salgado, H. Canesin, M. Diaw, and K. Hinrichs

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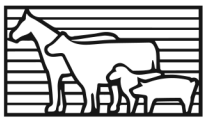
PETS



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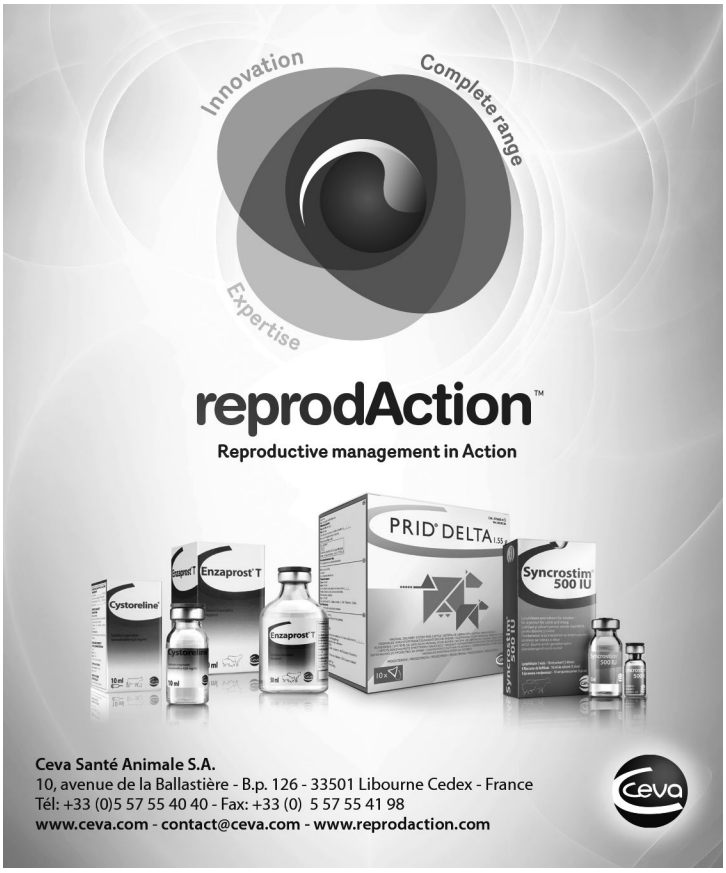
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2019 Recipient of the IETS Distinguished Service Award

Kenneth R. Bondioli

Dr. Kenneth R. Bondioli (Ken to all who know him) obtained his BS from Cornell University (1973), with his master's (1979) and PhD under the direction of Dr. Raymond Wright from Washington State University in 1982. For the next 10 years, Dr. Bondioli was the senior research scientist at Granada BioScience Inc., Marquez and College Station, Texas. He was instrumental in setting up the first bovine nuclear transfer and IVF laboratory, advanced protocols for bovine embryo sexing, and new approaches to arresting bovine oocytes for maturation; developed new embryo culture environments; improved embryo transfer procedures; was first to discover embryo toxic effects caused by media exposed to rubber-tipped syringes; and began using embryo splitting (glass technique) as a commercial option for bovine twinning. Granada was an open door to many researchers continentally as well as internationally, which afforded Dr. Bondioli the opportunity to promote research ideology for the advancement of animal production.

Dr. Bondioli took a position in 1992 as a special consultant for the American Breeders Service and in 1993 worked as a principle scientist for Altra Bio. Inc., Beltsville, Maryland. From 1996 to 2003 he was employed as the associate director for transgenic technology, Alexion Pharmaceuticals Inc., Sherburne, New York, before accepting a position at Louisiana State University, Baton Rouge, Louisiana, as an associate professor (2004–2011). Currently at LSU, Dr. Bondioli holds the position as Dr. Daniel Ivy Dupree Professor of Animal Science. He wears many hats that include chairing several faculty and safety committees with positions on agricultural councils. He continues to serve nationally by participating as a peer-review panelist for NIH (special grants), USDA National Research Initiatives for Animal Reproduction, and the Scientific Biotechnology Research and Development Consortium. In addition, he has for the past two years reviewed grants for the Estonian Research Council.

Dr. Bondioli first attended an IETS meeting in 1978. He served on the Board of Governors from 1991 to 1994 and was elected vice president (1991) and president (1992). From 1992 to 1995 and 2006 to 2014 he served on the IETS Foundation Board and over many years has served by chairing or co-chairing numerous meetings in addition to organizing preconference workshops (including this year) and student competitions.

Dr. Bondioli's research field has covered many aspects of embryology, cryopreservation, micromanipulation, transgenic production of porcine and caprine animal models for biomedical applications, somatic cell nuclear transfer (bovine and porcine), adult stem cells, gene knockout by homologous recombination, and genome editing with CRISPR-Cas9. His grant-writing abilities have accumulated amounts upward of 2 million dollars, helping to fund many researchers and postgraduate students. Since 1973 he has published more than 125 peer-reviewed articles, chapters, and technical articles and in his spare time is also a peer reviewer for 12 major journals.

Truly, Dr. Bondioli has "furthered the science of embryo production, development and transfer" as outlined in the IETS by-laws. He has made significant contributions to the embryo technology industry and continues to support IETS in the advancement of animal reproduction. Considering his commitment in service to IETS, academia, science, and technology, it is with great honor and pleasure to announce to you the recipient of the 2019 IETS Distinguished Service Award—Dr. Kenneth R. Bondioli.

Special Events

DABE-Morulas Preconference Symposium

State-of-the-art Approaches in Developmental and Reproductive Biology
Sunday, January 20
08:15–18:30
Grand Ballroom A
This year, the Morulas have teamed up with DABE to bring you this preconference symposium that will explore novel techniques currently being used in reproductive research. Leading researchers in the field, including Dr. Scott Magness, Dr. Li Qian, and Dr. Shuo Xiao, will cover topics such as single cell RNAseq technologies, in vivo cellular reprogramming, and organ-on-a-chip technologies. Morula members will compete in a poster presentation, and three selected trainees will present their research in the form of a short talk. At the end of the symposium, attendees are invited to a DABE social gathering where Morulas can get to know each other as well as more senior scientists.
(Ticket required)

Morulas and Mentors Luncheon

Monday, January 21
12:30–14:00
Grand Chenier
One of the main goals of the Morulas is to provide trainees the opportunities to interact with the general membership of the IETS. The Morulas and Mentors Luncheon is designed to give trainees a chance to sit down with mentors in small groups to develop meaningful connections with leaders in our field. Join a number of outstanding mentors at this annual event, and choose from one of eight mentors that you would like to dine with. Our confirmed mentors are Rebecca L. Krisher, Bill Swanson, Teresa Mogas, and Gary D. Smith.
(Ticket required)

Welcome Reception

Monday, January 21
18:00–19:00
Grand Ballroom CDE
Sponsored by Professional Embryo Transfer Supply Inc. (PETS)
A welcome reception will be held in the Grand Ballroom CDE of the Sheraton New Orleans Hotel, from 18:00–19:00. Meet the exhibitors and renew old friendships. Light hors d'oeuvres will be served with a cash bar.

Morulas Career Luncheon

Tuesday, January 22
12:00–13:30
Grand Chenier
Sponsored by CSIRO Publishing
This year's career luncheon will feature a talk by two speakers who will share unique perspectives from their own personal career paths. Hear from Dr. Patrick Blondin, Boviteq's director of embryo operations and Semex's director of research and development, who will be talking about research opportunities in industry, and Dr. Alvaro García Guerra, who will be discussing how to enjoy your PhD.
(Ticket required)

ARC Centre of Excellence for Nanoscale BioPhotonics (CNBP) Luncheon

(Invitation only)
Tuesday, January 22
12:00–13:30
Gallier AB
More than ever, innovation in livestock reproduction is demanded to ensure that livestock breeding is both efficient and cost effective, while enabling rapid genetic improvement to meet consumer and environmental demands. New ways of producing gametes and embryos and interrogating their cellular biology and that of the female reproductive tract are required to meet these challenges. The Australian Research Council Centre of Excellence for Nanoscale BioPhotonics is a multinodal, multidisciplinary team of researchers that are developing new light-based and nanoparticle tools to resolve previously inaccessible insights in tissue and cellular biology. We have a particular interest in

applying these continually evolving tools to livestock reproduction. Come hear what we can do, and how we are applying them to livestock reproduction. Furthermore, we want to understand what the intractable problems are that potentially could be solved by CNBP science.

Practitioners' Forum
Tuesday, January 22
16:00–18:00
Grand Ballroom AB
Recipient Management

CANDES Forum
Tuesday, January 22
16:00–18:00
Grand Couteau
Linking *ex situ* breeding initiatives with in situ reintroduction
Paul Marinari, Smithsonian Conservation Biology Institute, USA

Open Meeting of the Health and Safety Advisory Committee (HASAC)
Tuesday, January 22
18:30–19:30
Grand Ballroom AB

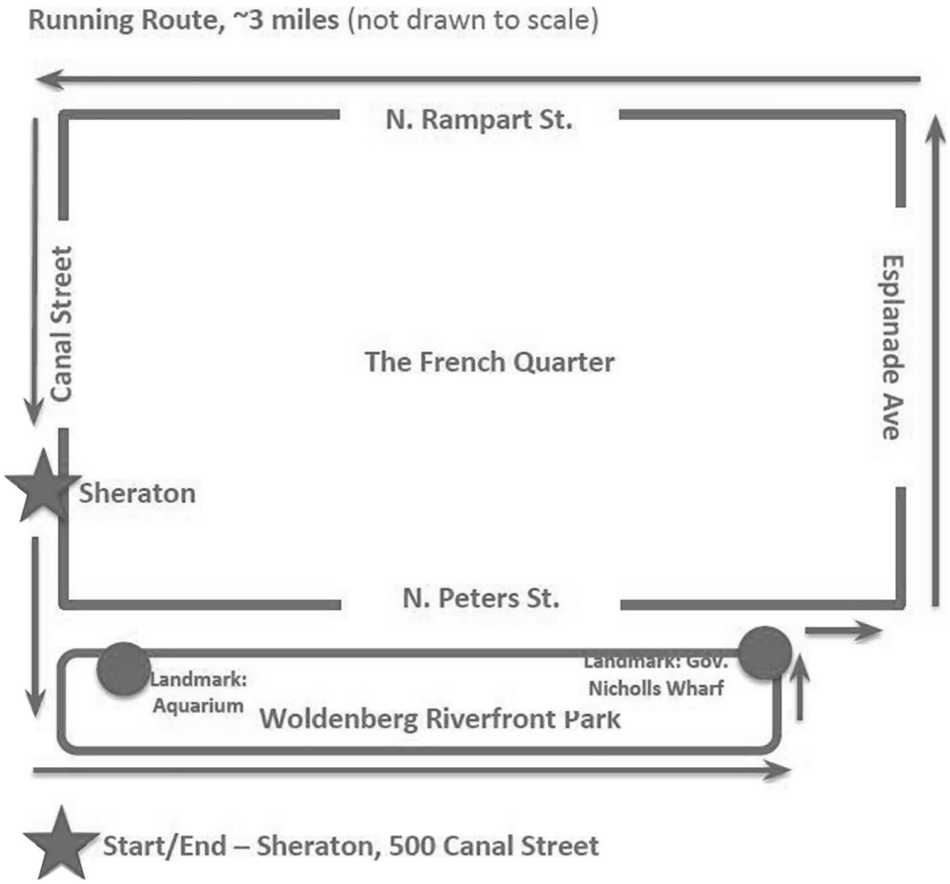
Morulas' Trainee Forum
Tuesday, January 22
18:30–19:30
Grand Couteau
All trainees are invited and encouraged to attend the Morulas' Trainee Forum. The Board of Governors will be updating the membership on activities and attending to business matters. In addition, we will welcome the new Morulas Governors and discuss important events and opportunities for all trainees. This is a great time to get involved and boost your international relations.
(Everyone is welcome.)

Morulas' Student Mixer
Tuesday, January 22
20:00
Flamingo A Go Go
After business comes fun! Shortly after the Morulas' Trainee Forum, everyone is invited to gather with friends and drinks for a social event. Hosted by IETS, this annual event is a fun time for all trainees to relax and enjoy the atmosphere. Take advantage of meeting new people and establish connections that last a lifetime. The mixer will be at the Flamingo A Go Go (869 Magazine Street), just a 10-minute walk from the Sheraton Hotel.
(Registration and tickets are NOT required.)

17th Annual IETS Fun Run
Wednesday, January 23
12:00–13:00
Join us for this coordinated fun run event. The route will take you to Canal to the waterfront, then to the Riverfront Park until Governor Nichols Wharf, then to the Esplanade to Rampart, to Canal, and back to the Sheraton. Even if you do not participate, come and cheer on the runners in a picturesque landscape and even dress up! Meet in the Sheraton Hotel lobby.

Closing Party
Wednesday, January 23
19:00–23:00
Sheraton New Orleans Hotel, Armstrong Ballroom and Foyer, and Orpheus
Share a meal, enjoy the surroundings, and get reacquainted with old friends. Come, listen, and dance to the music of the New Orleans X-ceptions, a high-powered, energy-driven band!
Come and join us for the event of the week.
(Tickets are required for this event.)

Fun Run Route



Running Directions

Right turn out of Sheraton, follow Canal Street past Harrah's
Cross Canal Street and head toward the river, in front of the Audubon Aquarium.
Follow the Riverfront Park to Gov. Nicholls Wharf (the end of the Riverwalk).
Turn left onto St. Phillip Street, then turn right onto N. Peters Street.
Turn left onto Esplanade Avenue.
Follow Esplanade to N. Rampart Street and turn left on N. Rampart Street.
Follow N. Rampart to Canal Street and turn left on Canal Street.
Follow Canal Street back to the Sheraton.

IETS Foundation 2019 Early Career Achievement Award (Scientist)

Alejo Menchaca

Alejo Menchaca has studied ovarian physiology and reproductive biotechnologies to design new tools that can be applied to farm animals. He has explored ovarian function, synchronization of ovulation for FTAI, and superstimulation for embryo transfer. His contribution has also reached the field of in vitro embryo production and cryopreservation, mainly in small ruminants. Recently, his team made pioneer advances in transgenesis, specifically, by reporting one of the first births of KO lambs using the CRISPR-Cas technology.

He has presented more than 100 talks, organized numerous international courses on embryo-related techniques, and worked on research projects and commercial programs in several countries.

This award recognizes two active IETS members (one practitioner and one scientist) for their independent contributions toward advancing the field of embryo transfer and its associated technologies.

The objective in offering this award is to foster participation of young practitioners and scientists in our society and recognize their excellence at the annual meeting. Currently, the society offers recognition of undergraduate and graduate students in the form of the Undergraduate Poster Competition, Student Research Competition, and Peter W. Farin Student Travel Scholarship Award. It also recognizes long-time members, offering the Pioneer Award and Distinguished Service Award. This award (Early Career Achievement Award) is intended to fill the void in recognition between students and long-term established members.

Previous Recipients

Kiho Lee (Scientist), 2018

Pablo J. Ross (Scientist) 2017

Todd Stroud (Practitioner) 2017

Session Speakers and Keynote Biographies

Rebecca Krisher

Dr. Rebecca Krisher is a reproductive biologist focusing on oocyte and embryo physiology. She received her bachelor's degree in biology from Hanover College, followed by a MS in animal sciences from North Carolina State University. She then worked at Granada BioSciences research division in College Station, Texas, before completing her PhD at Virginia Tech. She worked for several years as an embryologist in human clinical reproduction before conducting postdoctoral research at the University of Wisconsin. She was assistant and then associate professor at Purdue University and the University of Illinois before moving to her current role as research director at Colorado Center for Reproductive Medicine. Dr. Krisher's research program focuses on defining physiological processes within mammalian oocytes and embryos that are critical for subsequent embryonic and fetal development, with an emphasis on metabolism. In her current role, Dr. Krisher is translating these basic research findings into clinical application via improved culture media and new clinical treatments and assays to advance human assisted reproduction.

José-Alfonso Abecia

Professor José-Alfonso Abecia received his BVetMed degree from the University of Zaragoza (Spain) in 1988 and was awarded his PhD in 1992. His PhD work concerned the study of the effect of body condition on seasonality in sheep. He stayed for 16 months as a postdoctoral researcher at the former Macaulay Land Use Research Institute in Aberdeen, Scotland, under the supervision of Dr. Stewart Rhind. In 1992 he took up a lecturer position in the Department of Animal Production of the Faculty of Veterinary of Zaragoza, Spain. Since 2010 he has been a full professor of animal production and belongs to the University Institute of Research in Environmental Sciences of Aragon. Abecia has experience in the relationships between nutrition and reproduction, sexual seasonality in sheep, and social relations between rams and ewes. Melatonin has been the focus of his research during the last 20 years, specially its effect on embryo growth and development. Abecia is president of the UEECA (Association of the Spanish Animal Science Societies) and a member of the European College of Small Ruminant Health Management (ECSRHM).

William Swanson

Dr. William Swanson is the director of animal research at the Center for Conservation and Research of Endangered Wildlife (CREW), based at the Cincinnati Zoo and Botanical Garden. His educational background includes a BS in zoology from the University of Texas, a DVM from Texas A&M University, and a PhD in animal science from Louisiana State University. Following graduate school, Dr. Swanson completed a two-year postdoctoral fellowship at the Smithsonian Institution's National Zoological Park in Washington, DC, and was employed for three years as a gamete biologist at the Smithsonian's Conservation and Research Center. In 1997 he assumed his current position at the Cincinnati Zoo and Botanical Garden.

Over the past 30 years, his research efforts have focused primarily on investigating the reproductive biology of domestic cats and endangered wild cats to improve their captive management and conservation. His studies, conducted in the United States and in 18 foreign countries, have involved research with 30 wild felid species and 25 domestic cat models of human hereditary disease. Dr. Swanson also served for 10 years as co-chair of the Felid Taxon Advisory Group (TAG) for the Association of Zoos and Aquariums (AZA), helping to oversee population management programs for the 17 wild cat species maintained in 220 AZA-accredited North American zoos and aquariums. He currently is the coordinator of the AZA's Ocelot Species Survival Plan and reproductive advisor to the Felid TAG, and Ocelot, Fishing Cat, and Pallas' Cat Species Survival Plans.

Marcelo M. Seneda

Prof. Marcelo M. Seneda, DVM, PhD, has a postdoctorate from McGill University, Canada (2006–2007). At the State University of Sao Paolo, Brazil, he graduated from the school of veterinary medicine (1995) and earned a PhD (1999–2001) in animal reproduction and master's (1997–1999) in animal pathology. He has practitioner experience with dairy cattle (1995–1997). Seneda was president of the Brazilian Society of Embryo Technology (2018–2019), has been a professor at the University of Londrina since 2000, is chief of the Division of Large Animals—Veterinary Hospital, is coordinator of the Residence in Reproduction of Large Animals, and is editor of the book Biotechnology of Reproduction. He has published more than 125 scientific articles and 14 book chapters and has supervised 6 postdocs and 27 MSc and 14 PhD students. He is the speaker/chair in several countries such as USA, Canada, Ireland, South Africa, Argentina, Colombia, France, Peru, Thailand, and Ecuador. Seneda has been the coordinator of the International Symposium on Applied Animal Reproduction since 2004 and is the associate editor of the journal Reproduction in Domestic Animals. In 2012 he was honored with the Assis Roberto de Bem Award (Outstanding Research) by the Brazilian Society of Embryo Technology.

Àlex Bach

Àlex Bach is a research professor at ICREA and at the Department of Ruminant Production of IRTA. Bach conducts basic research to understand the physiology and metabolism of ruminants with especial emphasis on the effect of nutrition and management during early development on future metabolic function. His research focuses on optimizing the growth curve of dairy replacement heifers, as well as their management and housing systems (group size, behavior, stocking densities, and so on). He also uses mathematical models to simulate workflows of ruminant production systems, with the aim of helping the decision-making process in dairy enterprises. He has received several awards in recognition to his research activities; has spoken at more than 125 international congresses; and is author or coauthor of more than 125 peer-reviewed publications, more than 100 extension articles, and more than 20 books (or book chapters). He has served as a scientific expert in several committees of the European Food Safety Authority. He is section editor and sits on the editorial board of several scientific journals and is a member of various scientific committees.

Jeferson Ferreira da Fonseca

Jeferson Ferreira da Fonseca, DVM, MSc, DSc, has been a researcher with Embrapa Goat and Sheep since 2002. Ferreira da Fonseca works with assisted reproductive technologies in small ruminants, with emphasis in estrous cycle control, reproductive disorders, artificial insemination, and multiple ovulation and embryo transfer (MOET), especially with nonsurgical embryo transfer in goats and sheep. He also works in the area of technology transfer, event organization, and support for the development of small ruminant production systems in Brazil, Latin America, and Africa.

Teresa Mogas

Dr. Teresa Mogas is a professor in the Department of Animal Medicine and Surgery at the Autonomous University of Barcelona, where she has been on the faculty since 1994. She received her veterinary degree in 1990 and her PhD in 1994, both at the Autonomous University of Barcelona. She completed her postdoctoral studies at the University of Georgia (USA) and the University of Guelph (Canada). She has more than 20 years of documented research experience in in vitro embryo production including cattle, pigs, sheep, and goats. Dr. Mogas's group focuses fundamentally on the area of animal reproductive biotechnology, specifically on the improvement of the vitrification/warming protocols for oocytes and in vitro–produced embryos. They have also developed and patented a new methodology that enables field-warming/dilution and direct embryo transfer of vitrified bovine in vitro–produced embryos in field condition. Her current work includes the study of different strategies to increase the cryotolerance of bovine oocytes and embryos by modifying the cells themselves to make them more cryopreservable.

Gary D. Smith

Gary D. Smith, PhD, HCLD, is a professor of Ob/Gyn, Physiology, and Urology; director of the University of Michigan's MStem Cell Laboratory; and co-director of the University of Michigan's Reproductive Sciences Program. He completed his PhD and postdoctoral training at Washington State University and the Oregon Regional Primate Research Center, respectively. He has been scientific director of human assisted reproductive technology laboratories for 23 years at institutions such as the University of Chicago, the University of Michigan, the University of Sao Paulo (Brazil), and Baylor College of Medicine. His reproductive research focuses on regulation of oocyte meiosis and chromatin segregation; male and female gamete cryopreservation; preimplantation embryo development; and integration of new biotechnologies into gamete/embryo/human embryonic stem cell isolation, culture, and selection. He has done extensive work involving human embryonic stem cells (hESC). Dr. Smith was a participant in the drafting of Michigan Proposal 2008-2, which removed restrictions on embryonic stem cell research. With the passage of Michigan Proposal 2008-2, he established the state's first hESC derivation laboratory in 2009, now called MStem Cell Laboratory, the leading US institution in derivation of disease-specific hESC with acceptance on the NIH Stem Cell Registry.

Bianca Gasparrini

Bianca Gasparrini qualified in veterinary medicine in 1994 and received her PhD in animal breeding in 1999 at Federico II University of Naples. During her PhD she spent a sabbatical year at AgResearch Reproductive Technologies Laboratory, Ruakura Research Center, Hamilton, New Zealand. In 1999 she was awarded a postdoctorate grant by Federico II University of Naples. In 2000 she held a postdoc position as team leader of the embryo culture group of the Division of Gene Expression and Development at the Roslin Institute, Roslin, Midlothian, UK. From 2002 to 2014 she held a researcher position, and since November 2014 she has been an associate professor of biotechnologies applied to animal breeding in the Department of Veterinary Medicine and Animal Production, Federico II University of Naples. She is coauthor of 225 scientific publications, including 101 in peer-reviewed international journals, 19 main lectures at international conferences, and 2 book chapters. She has many international cooperations, is coordinator of 4 international university agreements, and has been principal investigators of several research projects. Her research has focused on innovative reproductive technologies in domestic species, with a particular interest in buffalo (Bubalus bubalis) in vitro embryo production.

Haja Kadarmideen

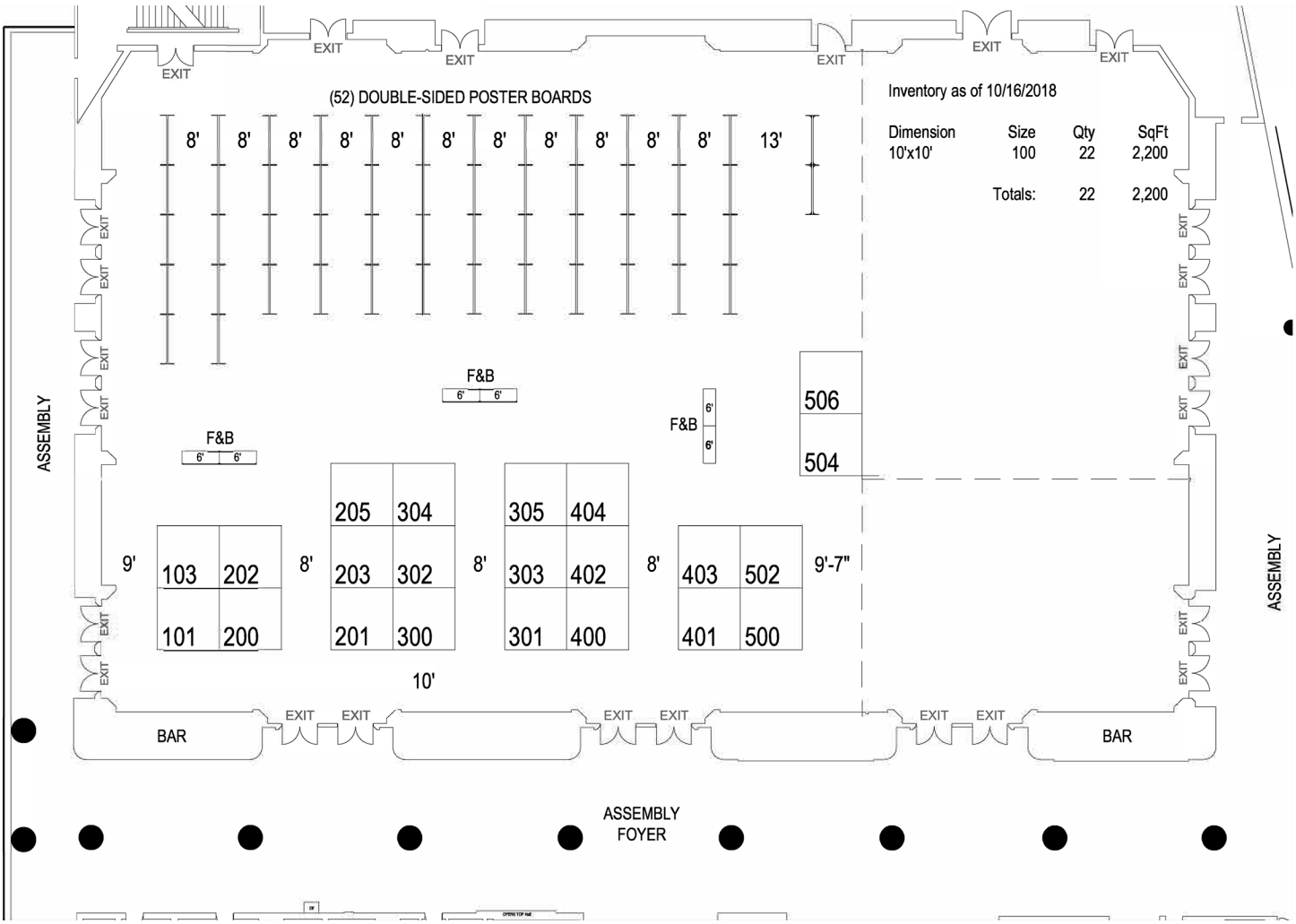
Haja Kadarmideen has been a professor and head of the Quantitative Genomics, Bioinformatics and Computational Biology Group at the Technical University of Denmark since March 2017. He is a research director for the GIFT consortium (a Danish–Brazilian joint strategic project on Genomic Improvement of Fertilization Traits in Cattle) as well as the BioChild Consortium (a Danish–Indian joint strategic project focused on personalized medicine aspects of childhood obesity). He was a full professor and leader of quantitative genetics and systems biology in the Faculty of Health and Medical Sciences at the University of Copenhagen, Denmark, for 6.5 years (2010–2017). Prior to Denmark, he was a principal scientist and research leader of quantitative and systems genomics at the Commonwealth Research and Industrial Research Organization (CSIRO) Queensland, Australia, for about 5 years (2006–2010) and was head of statistical genetics at the Swiss Federal Institute of Technology, Zurich (2001–2006). He obtained his PhD from the University of Guelph, Canada (1994–1998) and had his postdoctoral training at SRUC, the University of Edinburgh, UK (1998–2001).

His research interests are in associating genetic/genomic variations with production, health, reproduction, and performance traits in livestock and in-depth profiling and analysis of underlying molecular and functional pathways and networks. His expertise is in quantitative genomics, statistical genetics, bioinformatics, multi-omics data integration and systems, and network biology. He was a recipient of EU CIG award for 4 years in systems genomics of obesity and metabolic diseases. He also serves as a panel member of many strategic research councils in European countries and as an editorial board member of various scientific journals. He has over 320 scientific publications (with 105 journal papers indexed in ISI WoS) with an H-Index of 24. He has been research project leader or principal investigator for over 40 research projects and has been successful in attracting large external research grants during his career in Denmark and abroad.

Pat Lonergan

Pat Lonergan received his PhD from University College Dublin in 1992 in the area of in vitro production of bovine embryos. Following his PhD, he spent one year as a postdoctoral fellow at the Norwegian College of Veterinary Medicine, Oslo, and a further 4 years at L'Institut National pour la Recherche Agronomique (INRA), Tours, France, before returning to University College Dublin, where he is now professor of animal reproduction and part of a dynamic group working on various aspects of cattle fertility. His main research interests are in factors affecting early embryo development and understanding the maternal-embryonic dialogue associated with successful establishment of pregnancy. In addition, he is involved in projects relating to male fertility. He has published more than 250 peer-reviewed papers, has an h index of 73 (Google Scholar), and has presented many invited lectures at international conferences. He has served on the boards of the International Embryo Technology Society and the European Embryo Transfer Association and is a past president of IETS.

Exhibit Hall Layout



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506	DRAMINSKI S.A.

Alphabetical Listing of Exhibitors

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We appreciate the challenges you face with your livestock reproduction programs and work to provide solutions that influence your success. Agtech designs its ET instruments, consumables, and liquid medium to deliver efficacy and profitability to your business and to your client's dairy or beef operation.

International customers should check out our NEW web store, which lets you select products, automatically determine fees for transportation and duty, and pay for everything online *at your convenience*. Your package moves seamlessly…from Agtech's office to your destination outside the United States.

Because *success transfers*, we take pride in customer relationships and in providing you with the products and attention to detail that you expect. We look forward to working with you!

8801 Anderson Avenue
Manhattan, KS 66503-9612 USA
Phone: 800-367-4016
Fax: 785-776-4295
www.agtechinc.com
Booth: 500

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www.anshlabs.com
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ART Lab Solutions

In vitro–produced embryos (IVPE) is the preferred embryo technology for genetic gain in cattle. ART Lab Solutions is primarily focused on providing products and product development to those delivering reproductive technologies in cattle breeding industries. Services provided include complete product range of IVPE media for cattle embryo production, basic to comprehensive embryology training courses, and laboratory and cattle IVPE consultancy. With an innovative and experienced team, we are committed to delivering technologies that have a positive impact on cattle breeding. We source our innovations from our own research academic environment, providing a means of translating research into industry sought-after innovation.

ThincLab, 10 Pulteney Street
University of Adelaide
South Australia 5005
Australia
www.artlabsolutions.com
Booth: 302

Draminski S.A.

Draminski is a world-leading manufacturer of veterinary ultrasound scanners for large and small animals and the systems for embryo transfer. Since 1987 the company has been designing and manufacturing specialized portable equipment for veterinary medicine. Light and rugged became the signature characteristics of Draminski products intended for the most demanding users and the toughest of conditions. We are present on all continents, with a network of over 60 certified distributors all over the world. As a global player on the market, we care about the quality of the products we offer and strong after-sales service. Innovation is in our blood and we are adding innovative products to the company's portfolio all the time. Ongoing cooperation with prestigious research centers and scientists throughout the world provides the understanding, use, and implementation of our instruments ahead of the expectations of our customers.

Owocowa 17
10-860 Olsztyn
Poland
Phone: +48 89 527 11 30
Fax: +48 89 527 84 44
www.draminski.com
Booth: 506

E. I. Medical Imaging

E. I. Medical Imaging® (EIMI) is a world leader and the only US manufacturer of portable ultrasound solutions specifically engineered for veterinary use. For the past 35 years, the company's core values have remained intact: putting the customer first and delivering solid, effective ultrasound solutions. EIMI provides the Ibex® portable ultrasound systems.

110 12th Street SW
Unit 102
Loveland, CO 80537 USA
Phone: 1-866-365-6596
www.eimedical.com
Booth: 502

Esco Medical

Esco Medical is a leading manufacturer and innovator of high-quality equipment such as long-term embryo incubators, ART workstations, anti-vibration tables, and time-lapse incubators. We are continuously developing technologies to meet the increasing demand of the IVF industry.

Esco Medical products are designed to assist embryo development based on the Silent Embryo Hypothesis as a guiding principle. The Silent Embryo Hypothesis states that the less disturbed an embryo can remain, the better its developmental potential will be. Most of our products are designed in Denmark and made in the EU. The primary focus of this division is to increase pregnancy success rates and patient satisfaction.

Esco Technologies Inc.
903 Sheehy Dr., Ste. F
Horsham, PA 19044 USA
www.medical.escoglobal.com
Booth: 402

Fabric Onishi Co. Ltd.

We specialize in sales of 100% Japan-made animal feed additives made with licorice. China is a well-known producer of licorice, which is a raw material for additives, but our licorice comes from Central Asia and Eurasia. We have a strong partnership with a company who boasts the world's top market share in licorice extract. We work with local producers on managing their warehouses, and our licorice can be traced back to its origin. This means that even in the case of outbreaks of infectious animal diseases, we are able to secure a safe and stable supply of the licorice, avoiding the affected areas.

2064-7 Yamaguma Tachiarai-Machi
Mii-Gun Fukuoka, 830-1226
Japan
www.kanzou-shiryou.com
Booth: 300

ICPbio Reproduction

ICPbio Reproduction is a global supplier of embryo transfer and reproductive products, including flushing and embryo handling media for the equine, bovine, and ovine, used by veterinarians and reproductive specialists. ICPbio Reproduction also manufactures and distributes the Ovagen™ brand FSH for superovulation of ovine and bovine for embryo transfer procedures.

PO Box 39
303 South McKay Avenue
Spring Valley, WI 54767 USA
Phone: 877-978-5827
www.icpbiorepro.com
Booth 304

IMV Technologies/IMV Imaging

IMV Technologies is a world leader in reproductive biotechnologies. We design and develop equipment, disposable items, and preservation media used in animal reproduction. Our areas of expertise include the following:

- Embryo transfer
- Semen collection and analysis
- Sample preparation and dilution
- Packaging and cryopreservation
- Assisted insemination

IMV Technologies offers a wide range of ET products, including collection and freezing media, filtration devices, laboratory equipment, embryo packaging, and transfer tools. Our complete range can be found at www.imv-technologies.com.

IMV Imaging, pioneers in veterinary ultrasound for over 30 years, has joined forces with another successful animal reproduction and imaging company, ECM (Echo Control Medical), forming a new imaging division, IMV Imaging, under the IMV Technologies group.

IMV Technologies
11725 95th Avenue North
Maple Grove, MN 55369 USA
contact@imv-technologies.com
www.imv-technologies.com
Booth: 200

IMV Imaging
2900 43rd Street NW, #600
Rochester, MN 55901 USA
www.imv-imaging.com
Booth: 200

IVF Bioscience

IVF Bioscience manufactures high quality, species-specific media for *in vitro* fertilisation (IVF). Our innovative suite of ready-to-use media is helping many customers around the world to achieve higher blastocyst rates and superior results.Our advanced, serum-free media system is provided in combination with an optimised IVF protocol and backed by continuous technical support, so you can be confident that you are in good hands. We work with you to ensure you get the best results possible.With IVF Bioscience as your partner, establishing an IVF laboratory has never been easier.

Bickland Industrial Park
Falmouth, Cornwall TR11 4TA
United Kingdom
Phone: +44 132 637 0642
www.ivfbioscience.com
Booth: 401

IVFtech ApS

IVFtech is a company producing high quality, customizable equipment for IVF laboratories. The art and science of assisted reproduction often demands personalized solutions where strict considerations must be given to the culture conditions and the growth environment of gametes and embryos. Key factors for success include providing a steady temperature close to 37°C and a secure atmosphere with the right humidity and CO2 concentration.IVFtech knows that not all laboratories are the same; that's why IVFtech combines the bespoke nature of our products with a high quality and service level.Custom products and services are, by definition, unique.

Toppevadvej 34-38
DK-3660 Stenløse
Denmark
Phone +45 3940 2565
Fax +45 3940 2564
IVFtech aps – CVR no: 20892307
Contact: info@ivftech.dk
www.ivftech.dk
Booth: 403

Minitube USA

Minitube USA, a subsidiary of Minitube International, offers a comprehensive, multispecies reproduction product line ranging from artificial insemination to embryo transfer to meet any theriogenologist's needs. Our continued collaboration with leading reproductive physiologists, universities, and institutes around the world enables us to be on the leading edge of industry development.

6430 Mound Road
Delavan, WI 53115 USA
www.minitube.com
Booth 504

Partnar Animal Health Inc.

Partnar Animal Health is pleased to present its range of embryo transfer and OPU products. We will present information eMP3, our own range of embryo flush, hold, and freeze media. For OPU, we have tube sets, vacuum lines, retrieval needles, and the MicroQ controlled temperature shipping device for oocyte, embryo, and fresh extended sexed semen transport.

2014 Holland Avenue, Unit 227
Port Huron, MI 48060 USA
Phone: 519-666-0033
www.partnaranimalhealth.com
Booth: 201

Products Group Int'l Inc.

Products Group International has been a leader in veterinary ultrasound for over 35 years. We are passionate about providing quality equipment, service, and training utilizing the most current technology. Come by and see our newest Honda Color Doppler Ultrasound and Ovum Pickup (OPU) Systems.

447 Main Street
PO Box 1807
Lyons, CO 80540 USA
www.productsgroup.com
Booth: 205

Professional Embryo Transfer Supply Inc. (PETS)

PETS has been a world leading embryo transfer supply company in the bovine and equine industries for almost three decades. Our goal all this time has been your success, and we work every day to achieve this with quality service and E.T. supplies from ICPbio, Vetoquinol, MAI, ABT360, SPI, IMV, Wesco, and more. Come visit with us for more details.

285 FM 16
Canton, TX 75103 USA
Phone: 800-735-9215
www.pets-inc.com
Booth: 404

Sony Network Communications Inc.

Sony Network Communications has developed a Bovine Embryo AI (Artificial Intelligence) Analyzer. The Bovine Embryo AI Analyzer is a next-generation, *in vitro*–fertilized bovine embryo large-scale production management system that uses time-lapse imaging during embryo culture to automatically forward embryo images to the cloud, performs automatic analyses based on deep learning technology, and displays analysis results on a web dashboard all on a single unit.

1-7-1 Konan Minato-ku
Sony HQ 7F
Tokyo, 108-0075
Japan
https://iot.sonynetwork.co.jp/
Booth: 202

Universal Imaging Inc.

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We have 43+ years of experience leading the industry, and 18,000+ clients have trusted Universal Imaging to supply leading-edge diagnostic imaging equipment and superior training. Whether your practice focuses on internal medicine, cardiac, MSK, reproduction, or sports medicine, we have mobile optimized systems that will deliver the clarity and detail you need for a faster, more accurate diagnosis. We partnered with the pioneers of the digital imaging field, including Toshiba, ECM, Fujifilm,

Canon, SonoScape, and IBM/Merge. Visit our booth or website to learn how we can help you expand your practice and provide the highest standard of veterinary care.

299 Adams Street
Bedford Hills, NY 10507 USA
www.universalimaginginc.com
Booth: 103

Vetoquinol USA Inc.

Vetoquinol, the manufacturer of Folltropin®, is a family-owned, independent company devoted exclusively to animal health. Our product portfolio is divided between livestock and companion animals and includes most therapeutic categories. Vetoquinol embraces the challenge of finding better ways to help animals and is committed to servicing the assisted reproduction industry with its long lasting tradition of excellence. The company boasts one of the largest research facilities in the world, where 100 world-class researchers passionately work to develop new products and protocols.

4250 N. Sylvania Avenue
Fort Worth, TX 76137 USA
www.vetoquinolusa.com
Booths: 301, 400

WTA Technologies LLC

WTA Technologies LLC is a Brazilian technology company with additional offices in Texas. We specialize in producing tools for animal assisted reproduction, offering high-added-value solutions for ovum pick-up (OPU), *in vitro* fertilization (IVF), embryo transfer (ET), and artificial insemination (AI).

Our products are mainly for the reproduction of cattle, horses, and small ruminants, but we also meet different laboratory requirements.

WTA distributes throughout Brazil, USA, Canada, and Mexico, as well as in many countries across the five continents. WTA is recognized as one of the leading companies in the animal assisted reproduction market.

Each of our products is designed to provide the very best results and give a sense of security at an economical price, while always being mindful of animal welfare. Every piece incorporates precise design, quality materials, and excellent workmanship.

WTA Brazil: + 55 16 3951 8161
Sales USA: + 979-324-6168
www.wtavet.com.br
Booths: 303, 305

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DABE, Morulas Preconference Symposium

State-of-the-Art Approaches in Developmental and Reproductive Biology

New Orleans, Louisiana, January 20, 2019

08:15–08:30 Introduction—Beatriz Fernandez and Jorge Piedrahita

Session I: Single Cell Analytics in Stem Cell Biology and Regenerative Medicine

Dr. Scott Magness, University of North Carolina, Department of Biomedical Engineering

This section will be focused on single cell RNAseq (scRNAseq) technologies. The workshop will cover the methods for cell isolation, capture of single cells on various commercialized scRNAseq platforms, cDNA library preparation, quality control (QC) steps, sequencing, and data analysis pipelines.

08:30–09:15 Session I. Part 1: Background

09:15–09:30 Morulas selected abstract presentation
Biallelic CRISPR-Cas9 editing of gene associated with coat color in microinjected bovine zygotes reaching the blastocyst stage
M. Poirier (Abstract 80)

09:30–10:25 Session I. Part 2: Discussion and Q&A

10:30–11:00 Coffee break

Session II: In Vivo Cellular Reprogramming to Repair Damaged Tissues

Dr. Li Qian, University of North Carolina, Department of Pathology and Laboratory Medicine

Direct lineage conversion offers a new strategy for tissue regeneration and disease modeling. Dr. Qian's group has worked on understanding the molecular mechanisms underlying direct cardiac reprogramming to convert endogenous cardiac fibroblasts into iCMs to replenish the lost cardiomyocytes in damaged hearts. This session will discuss approaches for direct reprogramming in vivo and will highlight novel approaches and remaining barriers.

11:00–11:45 Session II. Part 1: Background

11:45–12:00 Morulas selected abstract presentation
Efficient editing of porcine parthenogenetic zygotes by electroporation of Cas9 ribonucleoprotein complexes
F. L. Ongaratto (Abstract 204)

12:00–12:55 Session II. Part 2: Discussion and Q&A

13:00–14:30 Lunch/poster session

Session III: Female Reproductive Cycle-on-a-Chip

Dr. Shuo Xiao, University of South Carolina, Reproductive Health and Toxicology Lab, Department of Environmental Health Sciences, Arnold School of Public Health

Pharmaceutical and environmental chemicals can have adverse impacts on female reproductive systems. We are using a microfluidic system to engineer the mammalian reproductive cycle. This organ-on-a-chip technology allows organ-organ integration of hormonal signaling, phenocopies the ovarian cycle and pregnancy-like hormone control, and has a potential to be used in the drug discovery and toxicology studies. This session will cover the principles of organ-on-a-chip and how they are being applied to reproductive toxicology.

14:30–15:15 Session III. Part 1: Background

15:15–15:30 Morulas selected abstract presentation
Towards the correction of meconium ileus with cystic fibrosis transmembrane conductance regulator (CFTR) intestinal expression in CFTR knockout sheep
I. Viotti Perisse (Abstract 205)

15:30–16:25 Session III. Part 2: Discussion and Q&A

16:30–17:00 Panel discussion

17:00–17:30 Poster awards

17:30–18:30 Social

IETS Preconference Symposium

In Vitro Embryo Production Technologies Workshop

Sunday, January 20, LSU AgCenter Research

Location

The Louisiana State University AgCenter Research Station is located in St. Gabriel, Louisiana, approximately one hour from New Orleans. Transportation will be available to the station and back to the Sheraton New Orleans Hotel. Lunch will be provided.

Format

The workshop will consist of two sessions, each consisting of four modules:

Bovine Ovum Pick-Up (OPU)
Bovine IVF and vitrification laboratory
Equine follicular aspiration
Equine Intra-Cytoplasmic Sperm Injection (ICSI)

Schedule

07:30	Depart from Sheraton Hotel by bus.
08:30	Arrive in St. Gabriel. Welcome from LSU AgCenter personnel.
09:00	Session One.
	Bovine OPU. Instructors Dr. André Dayan, Dr. Glenn Engelland, Dr. Charles Looney, and Jane H. Pryor.
	Bovine IVF and vitrification. Instructor Dr. Dimitrios Rizos.
	Equine OPU. Instructor Dr. Carlos Pinto.
	Equine ICSI. Instructor Dr. Chelsey Leisinger.
12:00	Lunch.
13:30	Session Two.
	Bovine OPU. Instructors Dr. André Dayan, Dr. Glenn Engelland, Dr. Charles Looney, and Jane H. Pryor.
	Bovine IVF and vitrification. Instructor Dr. Dimitrios Rizos.
	Equine OPU. Instructor Dr. Carlos Pinto.
	Equine ICSI. Instructor Dr. Chelsey Leisinger.
17:00	Depart by bus to the Sheraton Hotel.

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