Program Book

IETS 50th Annual Conference
Denver, Colorado
January 9–12, 2024

IETS
INTERNATIONAL EMBRYO TECHNOLOGY SOCIETY

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Program Book

50th Annual Conference of the International Embryo Technology Society

Past, Present, and Future of Reproductive Biotechnologies – IETS 50th Anniversary

INTERNATIONAL EMBRYO TECHNOLOGY SOCIETY

Hyatt Regency Denver at Colorado Convention Center
Denver, Colorado, USA
January 8–12, 2024

Scientific Program Co-Chairs:
Daniela Demetrio and Dawit Tesfaye

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Table of Contents

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Preface

The first IETS conference was held in January 1975, at Stouffer's Inn in Denver, Colorado, with 25 participants and 6 speakers. Today IETS has 782 members from 80 different countries, and we are back to its birthplace to celebrate its 50th Anniversary!

Denver celebrates its cowboy and mining heritage, while simultaneously looking to the future with a thriving cultural scene and outstanding outdoor events. The IETS has exclusive admission to the Denver Museum of Nature and Science and to the National Western Stock Show, complete with rodeos, livestock and horse shows, and trade shows.

This year's theme, "Past, present, and future of reproductive biotechnologies – IETS 50th Anniversary," will look back at the history of IETS and look forward to an exciting future with novel technologies that could change our industry. With the current increase in embryo production and transfers globally, this conference will create a unique opportunity for scientists and practitioners to exchange ideas on the challenges we face, and the opportunities to advance the impact of our Society on the ever-growing need to improve reproductive efficiency in animals.

The conference program is designed to provide a unique platform to facilitate the interaction between scientists and practitioners. The conference will start by reviewing the journey of IETS in the last 50 years with pioneers of embryo technology. The following sessions will discuss topics related to determinants of pregnancy establishment, fetal growth and placental function, and the current advancements in reproductive science and technology. Our George E. Seidel Jr Keynote lecture will be given by long-time IETS member and outstanding scientist Dr. Trudee Fair, who will give us insights on "The oocyte: The key player in the success of assisted reproductive technologies."

In addition to the main program, there will be three preconference symposia and a practitioner and Domestic Animal Biomedical Embryology forum. The first preconference symposium will be held at the National Western Stock Show and will focus on public communication. We will be acquiring reproductive technology knowledge while interacting with stock show guests. A second symposium will examine management of an IVF lab and share learnings from both human and bovine laboratories. A special CANDES symposium will celebrate a quarter century of research and discovery in rhinoceros, wild dogs, jaguar, fish, wildlife biobanking, and beluga reproduction. The Practitioners' Forum will be discussing the integration of reproductive ultrasound in bovine embryo recipient evaluation.

We hope that you enjoy the IETS time travel, and let's finish this conference at the Denver Museum of Nature and Science with a toast to the next 50 years!

Daniela Demetrio and Dawit Tesfaye, IETS 2024 program co-chairs

Acknowledgments

We would like to express our gratitude to **all** the people who dedicated their time to making this meeting possible.

Thank you to all invited speakers for accepting our invitation to share their valuable knowledge, and for working with us tirelessly to comply with the deadlines. We are also very thankful to all dedicated manuscript reviewers for providing very constructive and useful reviews of the manuscripts submitted by the invited speakers.

Thank you to all abstract authors for their high-quality scientific and practical collaboration. Several abstract session chairs and abstract reviewers have worked intensively to evaluate abstracts and make decisions to be accepted as poster or oral presentations. We are very grateful for your tremendous amount of work.

Special thanks to the IETS 50th Annual Conference Local Organizing Committee, chaired by Dr. Jennifer Barfield and Matthew Wheeler, for checking the venues for social and scientific events, and for organizing two outstanding preconference symposia and a practitioners' forum.

Thank you to Dragos Scarlet, all members of the CANDES Committee, and Morulas for organizing the CANDES/Morulas Preconference Symposium. Thank you to Marcia Ferraz and the DABE Committee for organizing the forum. We are also thankful to our colleagues on the various committees for their efforts and contributions that keep the IETS strong and relevant, and for making the annual meeting possible and organized in an excellent way.

We are very appreciative of the support provided by Debi Seymour and all of the FASS team during all stages of the preparation of the conference. Debi, you are the backbone of IETS, and you have contributed immensely to what IETS has become today. You will be greatly missed, but we wish you all the best in your new adventure!

Thank you to our exhibitors and sponsors for their participation, continued generosity, and financial support.

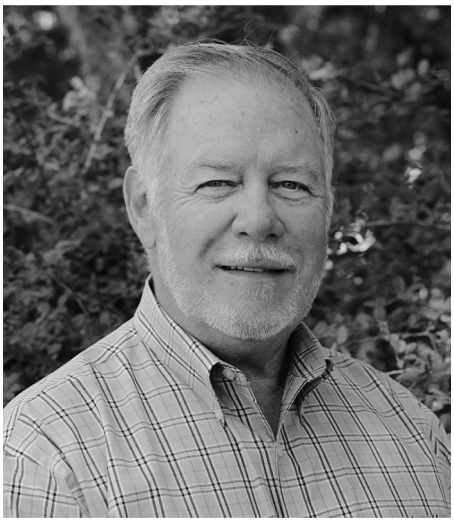
We have been extremely excited since we first got the invitation to co-chair the program of the 50th Anniversary of IETS in 2024 to be held in Denver, Colorado. We are very grateful to the Executive Board that selected us, Cesare Galli, Rebecca Krisher, and Pierre Comizzoli, and for all the support we received from them and the whole Board of Governors during the preparation of the conference program. Thank you for trusting us with such an important task!

Finally, we thank you all, IETS family members, for attending the 2024 IETS Annual Conference, IETS 50th Anniversary!

Daniela Demetrio and Dawit Tesfaye, IETS 2024 program co-chairs

Recipient of the 2024 IETS Pioneer Award

Edward L. Squires



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: Friday, January 12, at 13:45

Previous Recipients

E. Borges de Oliveira Filho (2023)
C. Keefer (2022)
Not awarded (2021)
E. Palmer (2020)
B. Bavister (2019)
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. Edward L. Squires grew up on a small farm in Morgantown, West Virginia, the home of West Virginia University. At age 11, he got his first job working at a stable, so it was only natural that he stayed at home and continued to work with horses and attend the university. After obtaining a BS in animal sciences, he was solicited to work on an MS degree under the guidance of a prominent reproductive biologist, Keith Inskeep. It was Dr. Inskeep that encouraged him to attend the University of Wisconsin for a PhD, under the mentorship of a previous Pioneer Award winner, O. J. Ginther. Dr. Ginther had several PhD students working at that time on various aspects of mare reproduction. Squires was assigned to study the follicular and luteal development in pregnant mares. One of his early papers demonstrated that the primary CL in the pregnant mares was viable to 120 to 150 days of gestation and that eCG rescued the primary CL from regression. Squires went on to demonstrate the role of the ovary and placenta in pregnancy maintenance. In 1976, Squires took a position at Colorado State University and joined the team at the Animal Reproduction Laboratory. He remained as part of that productive group for 33 years. In 1981, he published a novel paper on surgical and non-surgical equine embryo transfer. His team went on to develop the techniques for maintaining the viability of embryos stored at 5°C. Through the training of veterinarians from all over the country, the practice of collecting and shipping embryos to recipient stations became commonplace. One other area of great interest was the application of the oral progestin altrenogest for managing the mare's cycle. Squires and his students published numerous papers on the use of altrenogest in vernal transition as well as cycling mares. Other studies showed the value of altrenogest for pregnancy maintenance in broodmares and recipients.

With the help of Dr. Terry Nett, Squires investigated the seasonal changes in hypothalamic GnRH, GnRH receptors, and pituitary LH and FSH. Squires also investigated the use of GnRH for ovulation control and follicular development.

Also, during those early year at CSU, Squires took the opportunity to work with Bill Pickett, the famous stallion reproductive physiologist. They published on many aspects of stallion management, such as factors affecting sperm output and sexual behavior. His work also included identifying the best extenders for cooling and freezing semen. With the help of Dr. Amann, they determined the proper cooling curve needed for maintaining viability of semen cooled to 5°C. Jim Graham at CSU was also instrumental in designing experiments to evaluating the use of liposomes and cholesterol in semen extenders.

Squires is best known for his work in developing assisted reproductive techniques for the mare and stallion. This technology was transferred to veterinarians and breeders through short courses. These three- to five-day courses were started in the early 1970s and continue to the present. Thousands of breeders and veterinarians were taught the techniques of AI with cooled and frozen semen, embryo transfer, ultrasound, and cryopreservation of oocytes, sperm, and embryos.

Obtaining funding for equine research is a continual problem. A turning point in the equine research program at CSU occurred in the late 1990s. This was the creation of a privately funded research program, called the Preservation of Equine Genetics (PEG). The emphasis was equine assisted reproductive technology (ART), not genetics, and breeders gave several million dollars to CSU. These funds were used competitively to fund graduate students and faculty doing ART. It was through these funds that scientists such as Drs. Carnevale, McKinnon, Seidel, Nett, and Graham were able to participate in the PEG program. Out of that program came the development of technologies such as oocyte collection and transfer, superovulation, cooled and vitrified embryos, and sexed semen. It was very fortunate that Drs. Seidel, Graham, and Nett were all at CSU during the majority of Squires's career. At that time, Dr. George Seidel had developed one of the largest research and commercial programs in bovine ET in the world, and Squires was fortunate to have him involved in all the equine embryo projects. The semen sexing company XY also had its start at CSU and they were able to publish the birth of the first horse foals born from mares bred with sexed semen.

Superovulation of mares was also a passion of Squires. He initially tested the use of crude pituitary equine FSH for superovulation and then went on to demonstrate that a more purified pituitary FSH could be used to recover two to four embryos from FSH-treated mares versus 0.5 from non-treated mares. He also evaluated the use of recombinant FSH for superovulation of mares and is currently working with Pablo Ross and Jan Roser to produce a recombinant equine FSH for the equine market.

In collaboration with Paul Loomis at Select Breeders, Squires published several papers to identify the barriers for the use of frozen semen. These included the proper sperm numbers and frequency of AI, and mare management needed for maximum fertility with frozen semen.

In 2008, Squires moved to the Gluck Equine Research center at the University of Kentucky. With the assistance of Mats Troedsson and Barry Ball, they were able to get support from the thoroughbred industry to study pregnancy

losses in mares and post-breeding endometritis. The measurement of cytokines in resistant and susceptible mares provided insight into the possible treatment for endometritis.

Squires has published 339 articles in refereed journals and 20 chapters in textbooks, and he was one of the editors for the very popular text, *Equine Reproduction*, second edition by McKinnon, Squires, Varner, and Valla. He is co-author of a book titled *Equine Embryo Transfer* by McCue and Squires (2015).

Squires has attended nearly all the IETS meetings since 1982 and has been an invited speaker at four of the annual meetings. He served on the board of governors from 2005 to 2007. Squires served on the local organizing committee twice, in 2008 and 2016. Other areas of service include serving on the data retrieval committee for nearly a decade, as well as the IETS Foundation Board. He also served as a reviewer for abstracts on many occasions and was the chair of the stallion section for the horse IETS preconference in Paris in 2015. His vision is to continue to have a balance in the society where basic scientists, translational scientists, practitioners, and industry leaders can participate in the exchange of knowledge. One of his goals is to see that new technology is translated so that it can be used effectively in agriculture and biomedical science. Squires has extensive experience in teaching, research, clinical reproduction, the horse and veterinary industry, and fundraising from the horse industry for research.

He has lectured extensively nationally and internationally to veterinary and scientific groups and horse breeders in nearly 40 countries. He feels strongly that IETS should be a source of information for the practitioner and governing bodies and should be a leader in presenting new technologies.

Squires was inducted into the Equine Research Hall of Fame and has received numerous awards, including the Distinguished Alumni Award from the College of Agriculture, West Virginia University, George Stubb Award from the American Association of Equine Practitioners, honorary member of the College of Theriogenology, honorary vice president of the American Quarter Horse Association, past president of the Equine Science Society, chair of the International Symposium on Equine Reproduction, and most recently, honorary chair of the XIII International Symposium on Equine Reproduction.

He is a father of four sons and has seven grandchildren, all living within two hours of Denver. He and his wife Norma enjoy the farm they have in Colorado and spend time with the kids riding horses and camping. He currently has a consulting business and serves as a large animal technical specialist for Vetoquinol and research advisor for Select Breeders service.

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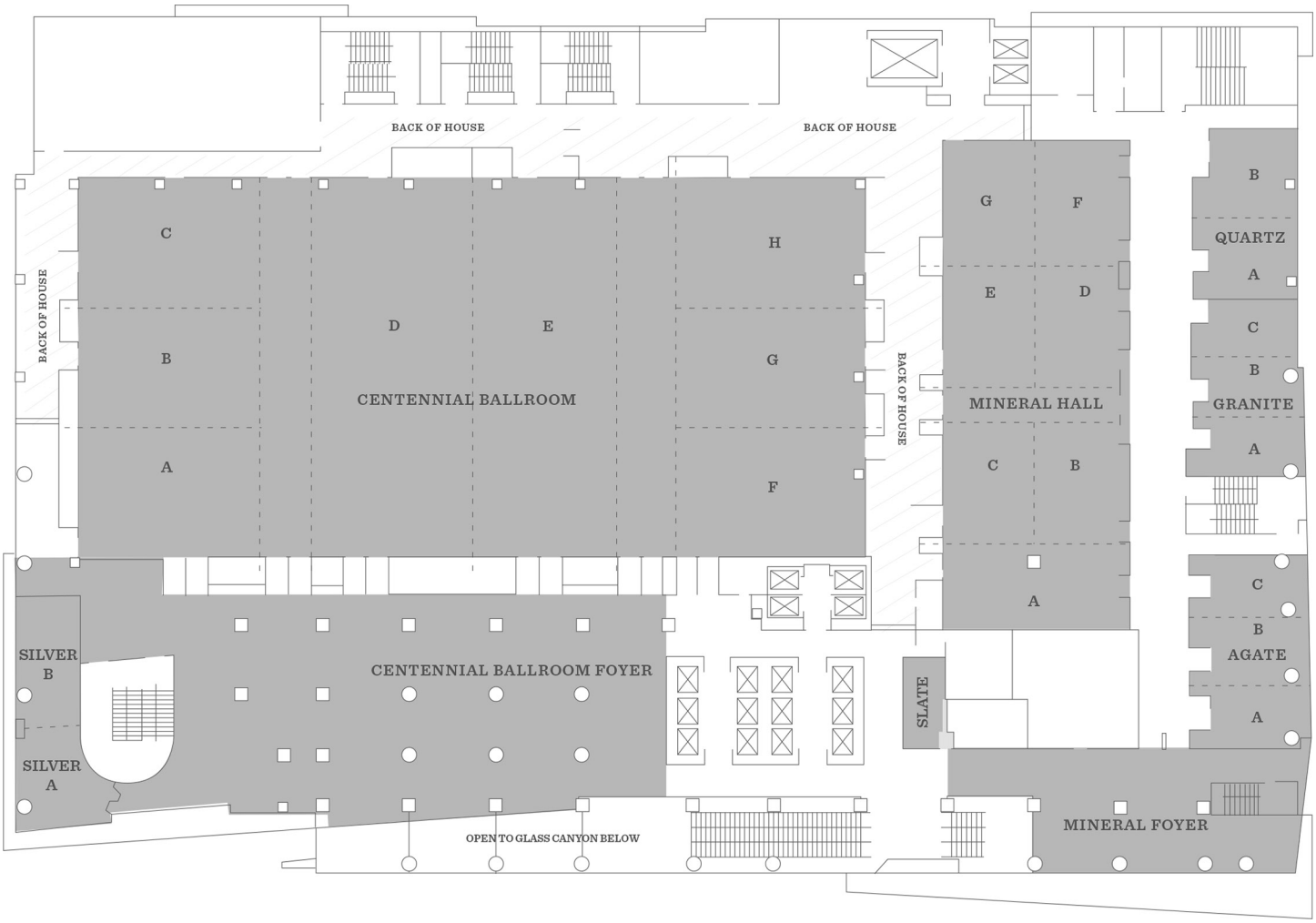
Map of the Venue

Hyatt Regency Denver at Colorado Convention Center

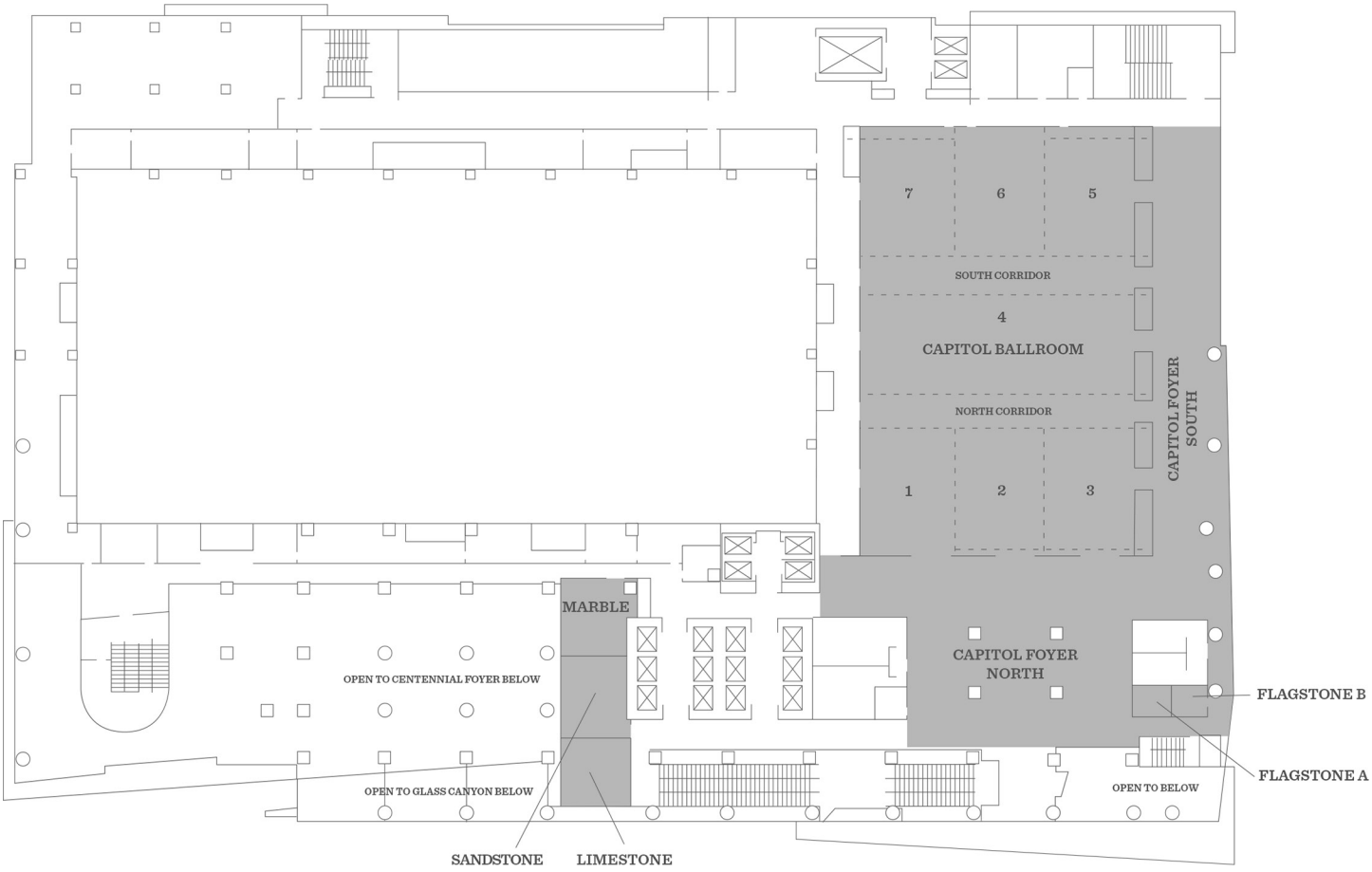
Meeting Space (Third Floor)



Map of the Venue

Hyatt Regency Denver at Colorado Convention Center

Meeting Space (Fourth Floor)



General Information

Meeting Room Directory

Main conference sessions	Centennial Ballroom A–C, and Mineral Hall B–C
Exhibits	Centennial Ballroom D–H
Poster displays	Centennial Ballroom D–H

Please see the Scientific Program for additional room assignments.

Registration Desk Hours

The registration desk is located on the third floor, Centennial Foyer.

Pickup of Preregistration Packets

Monday, January 8	08:00–18:00

Onsite Registration Hours

Tuesday, January 9	07:00–18:00
Wednesday, January 10	07:00–18:00
Thursday, January 11	07:30–16:00
Friday, January 12	08:00–14:00

Exhibit Information

Exhibits will be located in Centennial Ballroom D–H.

Exhibit Setup

Tuesday, January 9	13:00–18:00

Exhibits Open

Wednesday, January 10	09:00–19:30
	17:30–19:30 (Reception)
Thursday, January 11	08:00–19:00
Friday, January 12	08:30–13:00

Exhibit Teardown

Friday, January 12	13:00–16:00

All registrants of the 50th IETS Annual Conference will find a game board in their registration bags. Take time to meet the exhibitors and get your game boards filled. All completed game boards will be eligible for a drawing for one of four prizes on Thursday, January 11, immediately before the concurrent sessions.

Details on the exhibitors can be found in the Exhibit Directory on page 57.

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

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

Currency
The dollar is the currency accepted in Denver, Colorado. Should you need to exchange the local currency, you will be able to make exchanges at the Denver International Airport, Cherry Creek Shopping Center, and at ATMs. Credit cards are also widely accepted in Denver.

Passport and Visa Information
As with all IETS meetings, we expect attendees from all over the world. Check to determine if you need a visa to enter the United States. For a list of visa-free countries that only need a passport to travel to the United States or to apply for a visa, go to https://www.dhs.gov/visa-waiver-program-requirements.

Climate
January to March is the best time to visit Denver, especially for snowy activities. The weather in Denver tends to be mild; most days the sun shines brightly. Temperatures are in the upper 40s (°F).

Dressing in layers, warm knits, fleece, sweaters, winter coat, wool socks and snow boots, or some stylish booties for getting around town at night will help keep you nice and cozy. If you plan on hitting the slopes don't forget the snow-suit! Business casual may be worn for the meeting.

Siteseeing
Denver has activities year-round, and you do not have to spend money to enjoy these events. Check out things to do in Denver. https://www.denver.org/things-to-do/fall-winter/free-winter-tours-attractions/.

For the culinary fans, Delicious Denver, a company that provides culinary tours of Denver (https://www.deliciousdenverfoodtours.com), has created a discount code for our group. If you enter IETS50 at checkout, you will receive a 10% discount.

Registration Fees
All registration fees must be paid in US dollars or by credit card.

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 Centennial Ballroom D–H on the third floor of the Hyatt Regency Denver at Colorado Convention Center.

Dining and Entertainment

Dining in Denver is a foodie's delight. From brunch to that late-night evening drink, Denver offers something for everyone and every budget. Downtown Denver has restaurants, bars, pizza, Latin food, American food, and more, all within walking distance of the hotel. Want to include some shopping with your meal? Try the 16th Street Mall. Don't want to leave the hotel? Try the Former Saint Craft Kitchen and Taps. For a breathtaking view of downtown Denver, check out the Peaks 27th Floor Lounge.

Services and Amenities

Guests can take advantage of the fitness center, complimentary internet in guest rooms, and pool.

Program

Sunday, January 7

08:00 – 18:00 IETS Board of Governors meeting (Silver AB)
08:00 – 17:00 HASAC Research subcommittee meeting (Agate AB)
09:00 – 18:00 W4171 Committee Meeting (Agate C)

Monday, January 8

08:00 – 17:00 IETS Board of Governors meeting (Silver AB)
08:00 – 18:00 Registration (Centennial Foyer)
08:00 – 18:30 Interactive Preconference Symposium, Communicating and demystifying bovine embryo assisted reproductive technologies – National Western Stock Show

Tuesday, January 9

08:30 – 17:00 Preconference Symposium, Best Practices in IVP – Tips, tricks, and lab management in cattle and human IVF clinics (Centennial Ballroom ABC)
08:30 – 17:00 CANDES/Morulas Preconference Symposium – A quarter century of CANDES: State-of-the-ART in companion animals, non-domestic and endangered species (Mineral Hall B, C)
08:30 – 10:30 HASAC Forms and Certificates subcommittee meeting (Agate A, B)
13:00 – 17:00 Exhibitor setup (Centennial Ballroom D–H)
13:00 – 17:00 Poster setup (Centennial Ballroom D–H)
11:00 – 12:30 Manual subcommittee meeting (Agate A, B)
13:30 – 17:30 HASAC Regulatory subcommittee meeting (Agate A, B)
17:30 – 20:00 IETS Foundation Board of Trustees meeting (Silver A, B)
17:30 – 19:30 Abnormal Calf Syndrome meeting (Mineral Hall B, C)

Wednesday, January 10

07:00 – 08:30 Poster Setup (Centennial Ballroom D–H)
07:00 – 08:30 Past Presidents' Breakfast (Agate A, B)
07:00 – 08:30 Graduate and Undergraduate Student Competition Presenters' Breakfast, with IETS Foundation Education Chair (Granite A, B)
09:00 – 19:00 Commercial Exhibits (Centennial Ballroom D–H)
08:30 – 08:45 Opening and Welcome (Centennial A–C)

Session I: The Past – 50 years of IETS, how far have we come (Centennial A–C)

Session co-chairs: Gabriel Bó, Instituto de Reproducción Animal Córdoba, and Laura Thompson, University College Dublin

08:45 – 09:05 Looking back at five decades of embryo technology in practice
John Hasler, Vetoquinol, USA

09:05 – 09:25 IETS management of the challenges associated with embryo pathogen interaction
Michel Thibier, France

09:25 – 09:45 How I overcame problems in *in vitro* fertilization of livestock animals
Takashi Nagai, Japan

09:45 – 10:15 Discussion with the three speakers
10:15 – 10:25 Morulas Welcome (Centennial Ballroom A–C)
10:25 – 11:00 Poster Viewing and Exhibits (Centennial Ballroom D–H)

IETS Foundation Student Competition Presentations (Centennial Ballroom A–C)

Session chair: Khoboso Lehloenya, University of Zululand

11:00 – 11:15 Time to conceptus attachment and subsequent pregnancy loss in seasonal-calving pasture-based lactating dairy cows following timed artificial insemination with conventional or X-sorted semen or timed embryo transfer with frozen–thawed *in vitro*-produced embryos
A. D. Crowe, , J. M. Sánchez, S. G. Moore, M. McDonald, F. Randi, A. Santos, T. Minela, J. Branen, J. R. Pursley, P. Lonergan, S. T. Butler* (Abstract 1)

11:15 – 11:30 Profiles of pregnancy-associated glycoproteins for Holstein embryo recipients with pregnancy losses in different periods during the first two months of gestation
J. P. N. Andrade, R. R. Domingues, V. Gomez-León, G. Madureira, L. C. Sartori, G. F. Grillo, M. Fosado, R. Sala, M. C. Wiltbank* (Abstract 2)

11:30 – 11:45 Epiblast ablation by *SOX2* knockout does not impair early development of bovine extra-embryonic membranes
I. Flores-Borobia, A. Pérez-Gómez, B. Galiano-Cogolludo, J. G. Hamze, N. Martínez de los Reyes, P. Ramos-Ibeas, P. Bermejo-Álvarez* (Abstract 3)

11:45 – 12:00 Exploring the actions of FLI on *in vitro*-produced bovine embryo development and viability
K. McDonald, R. Prather, M. S. Ortega* (Abstract 4)

12:00 – 12:15 Age-dependent changes in DNA methylation levels of spermatozoa and the relationship to their motility and fertility in Japanese Black bulls
M. Iwamoto, K. Ohta, M. N. Islam, K.-I. Yamanaka* (Abstract 5)

12:15 – 12:30 Comparison of three methodologies for producing gene-edited pigs for xenotransplantation
G. E. La Motta, O. Briski, L. D. Ratner, F. A. Allegroni, S. Pillado, G. Álvarez, P. E. Otero, M. Acerbo, R. Fernández-Martín, D. F. Salamone* (Abstract 6)

12:30 – 14:00 Lunch Break

12:30 – 14:00 IETS Committee Lunch with Partner Societies (Granite A, B)

12:30 – 14:00 Morulas and Mentor Lunch (Mineral A)

12:30 – 14:00 Emerging Technology and Issues Subcommittee meeting (Agate A, B)

Session II: Determinants of pregnancy establishment

Session co-chairs: Alvaro Garcia-Guerra, The Ohio State University, and Gabriela Lamberti, Oklahoma State University

14:00 – 14:45 Molecular and cellular programs underlying the development of bovine pre-implantation embryos
Zongliang Jiang, University of Florida, USA

14:45 – 15:30 Paternal determinants of early embryo development
Sofia Ortega, University of Wisconsin–Madison, USA

15:30 – 16:00 Poster Viewing and Exhibits (Centennial Ballroom D–H)

16:00 – 16:45 Selected short presentations (Centennial Ballroom A–C)

Effectiveness of the timing of trypsin washing to remove pathogens from *in vitro*-produced bovine embryos at different stages of development
E. Xiao-Kim, J. Kincade, A. Bosco-Lauth, J. P. Barfield* (Abstract 134)

A two-step protocol for the generation of a three-dimensional implantation model *in vitro*
*S. Arcuri, G. Pennarossa, F. Gandolfi, T. A. L. Brevini** (Abstract 75)

Superovulatory response and embryo production in beef cows treated with a recombinant human FSH
E. Ponte, J. A. Sola, A. Tribulo, J. M. Oviedo, P. Tribulo, D. Beltramo, R. J. Tribulo, H. E. Tribulo* (Abstract 118)

16:45 – 17:15 Distinguished Service Award (Centennial Ballroom A–C)

17:30 – 19:30 Welcome Reception, Poster Viewing and Exhibits (Centennial Ballroom D–H)
19:30 – 20:30 Student Mixer (Quartz A, B)

Thursday, January 11

07:00 – 08:00 Organizational Breakfast Meeting of the IETS Foundation (Silver A, B)
08:00 – 19:00 Exhibits (Centennial Ballroom D–H)

Session III: The present technologies that changed the direction of the ET industry (Centennial Ballroom ABC)

Session co-chairs: Ricarda Santos, Universidade Federal de Uberlândia, Jessica Cristina Lemos Motta, The Ohio State University

08:00 – 08:45 Reproduction in the era of genomics and automation
Ricardo Chebel, University of Florida, USA

08:45 – 09:30 Mammalian embryo culture media: Now and into the future
Deirdre Zander-Fox, Monash IVF Group, Australia

09:30 – 10:00 Break, Poster Viewing with Exhibits (Centennial Ballroom D–H)

Session IV: Fetal growth and placental function (Centennial Ballroom ABC)

Session co-chairs: Patrick Lonergan, University College Dublin, and Masroor Sagheer, University of Florida

10:00 – 10:45 Understanding conceptus-maternal interactions: What tools do we need to develop?
Niamh Forde, University of Leeds, United Kingdom

10:45 – 11:30 Understanding placentation in ruminants: A review focusing on cows and sheep
Gregory Johnson, Texas A&M University, USA

11:30 – 12:30 HASAC Open Meeting (Centennial Ballroom A–C)
11:30 – 12:30 Morulas Forum (Mineral Hall B, C)
12:30 – 14:00 Lunch Break
12:30 – 14:00 IETS Data Retrieval Committee Meeting (Agate A, B)
12:30 – 14:00 IETS Exhibitors' Luncheon with IETS Board of Governors (Mineral Hall D, E)
12:30 – 14:00 Morulas Career Luncheon (Mineral Hall A)
14:00 – 14:30 **Peter Farin Trainee Award Winners Presentations** (Centennial Ballroom ABC)
Chair: Nisar A. Wani, Reproductive Biotechnology Centre

Takashi Tanida, Hokkaido University
Roksan Franko, Ludwig-Maximilians University of Munich
Lais Barbosa Latorraca, University College Dublin
Laura Thompson, University College Dublin
Masroor Sagheer, University of Florida
Hector Nava-Trujillo, University of Missouri

14:30 – 15:00 IETS Business Meeting (Centennial A–C)

Concurrent Forum (Centennial A–C)

15:00 – 17:00 Practitioners' Forum
Sponsored by Calier
Chair: Matthew Wheeler, University of Illinois
Integration of Reproductive Ultrasound in Embryo Recipient Evaluation
1. Pre-screening recipients before synchronization (Hour 1)

Cyclicity of heifers (CL, RTS, Cervix); Cyclicity of early PP cows (CL, UT involution, post-calving trauma/uterine infection); Cyclicity of nutritionally restricted cows/heifers (CL, follicular activity, CL, uterus).

Presenters: Luiz Nasser, BORN Biotechnology, Panama
Brad R. Lindsey, Ovitra Biotechnologies, Texas

2. Assessment of CL viability at time of transfer (Hour 2)

a. No ultrasound use (rectal palpation of ovaries and uterus); traditional real-time US (CL, CL types – homogenous vs. fluid cavity vs. luteal cyst, uterine appearance); Correlates to utilization rates, non-return rates, pregnancy rates.

Presenter: Daniela Demetrio, Ruann and Maddox Dairy, California

b. Using ultrasound to specifically evaluate recipients' endometrial/corpora lutea vascularization via color Doppler enhancement and how it might correlate to uterine/CL viability and, thus, pregnancy rate/retention.

Presenter: Sotirios Karvountzis, Bow Valley Genetic Limited, Canada

Panel Discussion – Luiz Nassar, Brad R. Lindsey, Daniela Demetrio, and Sotirios Karvountzis will present a short summary of each topic presented followed by an interactive panel discussion between the experts and the audience. Numerous real-life practical scenarios will be covered during the presentations and discussion.

Concurrent Forum (Mineral B, C)

15:00 – 17:00 DABE Forum
Chair: Marcia A. M. M. Ferraz, Ludwig-Maximilians-Universitat Munchen

15:00 – 15:05 Introduction

15:05 – 16:00 Unveiling the journey of animal cloning: Exploring past technologies and charting future directions
Angelika Schnieke, Technical University of Munich's School of Life Sciences, Germany

16:00 – 16:45 Selected abstract presentations

16:00 – 16:15 Enhancing livestock resilience: Epigenetic diversity in bovine
Lofti Bouzeraa, Université Laval, Canada

16:15 – 16:30 Identification of bovine myostatin core promoter and its application for transgenesis *in vitro*
Kyeong-hyeon Eom, Seoul National University, Republic of Korea

16:30 – 16:45 Functional ablation of pregnancy-associated glycoprotein 7 affects attachment and growth of trophectoderm cell lines
Ethel Moreno, University of Wisconsin–, USA

16:45 – 17:00 Closing remarks

17:00 – 19:00 **Poster Session I and Reception** (Centennial Ballroom D–H)

17:00 – 19:00 **Exhibits** (Centennial Ballroom D–H)

Friday, January 12

07:00 – 08:00 Organizational Breakfast Meeting of the IETS Board of Governors (Silver A, B)

08:30 – 13:00 Commercial Exhibits (Centennial Ballroom D–H)

Session V: New Advancements in reproductive technologies (Centennial Ballroom (ABC)

Session co-chairs: Michael Hoelker, Göttingen University, and Nico G. Menjivar, Colorado State University

08:00 – 08:45 Production of light-colored, low heat-absorbing Holstein Friesian cattle by precise embryo-mediated genome editing
Goetz Laible, AgResearch, New Zealand

08:45 – 09:30 From fertilized oocyte to cultivated meat – Harnessing bovine embryonic stem cells in the cultivated meat industry

Eldar Zehorai, Aleph Farms, Israel

09:30 – 10:30 Selected oral presentations

Microfluidics in assisted reproductive technologies: OoTrap for oocyte capture and *in vitro* maturation

R. Franko, M. De Almeida Monteiro Melo Ferraz* (Abstract 192)

Machine learning identifies differences in morphokinetics of *in vivo*-derived bovine embryos between hot and cool seasons

C. Hayden, C. Wells, A. Wiik, R. Killingsworth* (Abstract 229)

Development of interspecies somatic cell nuclear transfer (iSCNT) caprine-bovine embryos injected with demethylase mRNA and mitochondrial extract

L. Adams, Y. Liu, T. Patrick, E. Grow, E. Ruggeri, B. Durrant, I. Polejaeva* (Abstract 18)

Stable germline transmission of multiple gene-edited bulls for precision breeding

D. H. Kwon, K. H. Eom, G. M. Gim, B. J. Jeon, J. Y. Choi, D. J. Jung, D. H. Kim, J. K. Yi, J. J. Ha, J. H. Lee, S. R. Han, S. B. Lee, S. Y. Yum, W. W. Lee, G. Jang* (Abstract 159)

10:30 – 12:30 **Poster Session II** (Centennial Ballroom D–H)

12:00 – 13:30 Lunch Break

12:00 – 13:30 2024, 2025, 2026 IETS Program Committee Lunch (Agate A, B)

13:30 – 16:00 Commercial Exhibit and Poster Take down (Centennial Ballroom D–H)

13:45 – 14:15 Pioneer Award (Centennial Ballroom A–C)

Session VI: George E. Seidel, Jr. Keynote Lecture The Future of Embryo Technologies (Centennial Ballroom A–C)

Session co-chairs: Rebecca Krisher, Genus Plc, and Lais Barbosa Latorraca, University College Dublin

14:15 – 15:00 The oocyte: The key player in the success of assisted reproduction technologies
Trudee Fair, University College Dublin, Ireland

Awards Presentation and Updates (Centennial Ballroom A–C)

15:00 – 15:50 IETS Foundation Early Career Achievement Award Winners Presentations
Chair: Carol Hanna, Oregon National Primate Research Center

15:00 – 15:25 Early Career Achievement Award (Scientist)
Ky G. Pohler, Texas A&M University, College Station, USA

15:25 – 15:50 Early Career Achievement Award (Practicing Professional)
Brittany Scott, SMART Reproduction, Jonesboro, USA

15:50 – 16:15 IETS Foundation Student Competition Awards

CSIRO Publishing Poster Competition

Chair: Jennifer Kelly, University of Adelaide

Undergraduate Student Poster Competition

Chair: Rolando Pasquariello, University of Milan

Graduate Student Research Competition

Chair: Jennifer Kelly, University of Adelaide

16:15 – 16:30 CANDES, DABE, and HASAC Updates

16:30 – 16:45 Closing Ceremony

18:00 – 23:00 Closing Party, Denver Museum of Nature & Science
Closing remarks and a toast to the future of IETS

The Program Co-Chairs Acknowledge and Thank the Following People

Section Editors

Khoboso C. Lehloenya, *Graduate Student Competition*
Pierre Comizzoli, *Bioethics, Welfare, and Sustainability*
Salvador Romo Garcia, *Case Reports and Field Data*
Irina Polejaeva, *Cloning/Nuclear Transfer*
Barbara Durrant, *Companion CANDES*
Jeremy Block, *Cryopreservation/Cryobiology*
Felipe Perecin, *Developmental Biology*
Matthew Lucy, *Early Pregnancy*
Satoko Matoba, *Embryo Culture*
Pat Lonergan, *Embryo Manipulation*
Andrés Vera Cedeño, *Embryo Transfer*
John Bromfield, *Epidemiology/Diseases*
Jaswant Singh, *Fertilization/ICSI/Activation*
Anna Denicol, *Folliculogenesis/Oogenesis*
Charles Long, *Genetic Engineering*
Marco Coutinho da Silva, *Male Physiology*
Ricarda Maria dos Santos, *Oestrus Synchronization/ Artificial Insemination*
Brad Lindsey, *Oocyte Collection*
Juliano da Silveira, *Oocyte Maturation*
Alan Ealy, *Periconceptional/Fetal Programming*
Jorge Piedrahita, *Stem Cells*
Alvaro Garcia Guerra, *Superovulation*
Rolando Pasquariello, *Undergraduate Poster Competition*

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Nisar Wani
Bethany Weldon
Brian Whitaker
Christine Wrenzycki
Jimena Yapura
Carly Young
Ye Yuan
Louisa Zak
Leticia Zoccolaro Oliveira

Poster Session Information

The size of your poster should be 36 inches (92 centimeters) **wide** and 48 inches (122 centimeters) **tall**. The poster materials may be affixed with tape or pins. You must stay within these poster parameters.

Poster Numbers

Posters are identified by the number corresponding to the abstract number in *Reproduction, Fertility and Development* 2024, 36:(1–2). Numbering of the posters begins at 1 and ends at 234.

Location

Posters are located in the Centennial Ballroom D–H of the Hyatt Regency Denver at Colorado Convention Center on the third floor (see map on page 7).

Setup

All numbered posters, including the student competition finalists and the undergraduate poster finalists, can be put up from 13:00 to 17:00 on Tuesday, January 9, and from 06:30 to 08:00 on Wednesday, January 10. **All posters will remain up throughout the entire meeting.**

Poster numbers should be printed on your poster in the top left corner.

Poster Session I

Presentations by authors of odd-numbered abstracts (e.g., 7, 9, 11) in *Reproduction, Fertility and Development* 2024; 36(1–2), as well as the student competition finalist and undergraduate finalist poster presentations, will take place from 17:00 to 19:00 on Thursday, January 11. Odd-numbered posters for the Best Poster competition will also be judged from 17:00 to 19:00 on Thursday, January 11.

Poster Session II

Presentations by authors of even-numbered abstracts (e.g., 8, 10, 12) in *Reproduction, Fertility and Development* 2024; 36(1–2) will take place from 10:30 to 12:30 on Friday, January 12. Even-numbered posters for the Best Poster competition will be judged from 10:30 to 12:30 on Friday, January 12.

Teardown

All posters must be removed between 13:00 and 16:00 on Friday, January 12. Posters that are not taken down by 16:00 on Friday will be taken down and discarded.

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Poster Session Order by Topic

Poster number = abstract number in *Reproduction, Fertility and Development* 2024; 36(1-2)

Graduate Student Competition Finalists

1 Time to conceptus attachment and subsequent pregnancy loss in seasonal-calving pasture-based lactating dairy cows following timed artificial insemination with conventional or X-sorted semen or timed embryo transfer with frozen–thawed *in vitro*-produced embryos
A. D. Crowe, J. M. Sánchez, S. G. Moore, M. McDonald, F. Randi, A. Santos, T. Minela, J. Branen, J. R. Pursley, P. Lonergan, and S. T. Butler

2 Profiles of pregnancy-associated glycoproteins for Holstein embryo recipients with pregnancy losses in different periods during the first two months of gestation
J. P. N. Andrade, R. R. Domingues, V. Gomez-León, G. Madureira, L. C. Sartori, G. F. Grillo, M. Fosado, R. Sala, and M. C. Wiltbank

3 Epiblast ablation by *SOX2* knockout does not impair early development of bovine extra-embryonic membranes
I. Flores-Borobia, A. Pérez-Gómez, B. Galiano-Cogolludo, J. G. Hamze, N. Martínez de los Reyes, P. Ramos-Ibeas, and P. Bermejo-Álvarez

4 Exploring the actions of FLI on *in vitro*-produced bovine embryo development and viability
K. McDonald, R. Prather, and M. S. Ortega

5 Age-dependent changes in DNA methylation levels of spermatozoa and the relationship to their motility and fertility in Japanese Black bulls
M. Iwamoto, K. Ohta, M. N. Islam, and K.-I. Yamanaka

6 Comparison of three methodologies for producing gene-edited pigs for xenotransplantation
G. E. La Motta, O. Briski, L. D. Ratner, F. A. Allegroni, S. Pillado, G. Álvarez, P. E. Otero, M. Acerbo, R. Fernández-Martín, and D. F. Salamone

Case Reports and Field Data

7 Intravaginal administration of Misoprostol before artificial insemination improves the fertility of sheep
Ayman Swelum, Magdi Bahady, Abdullah Moamen, and Abdullah Alowaimer

8 Characteristics of guinea pig (*Cavia porcellus*) oocytes at two stages of the estrous cycle on nuclear status and mitochondrial distribution
Edisson F. Bravo, Katherine M. Castro, Jorge X. Samaniego, Luis E. Ayala, Diego A. Galarza, Patricia Villamediana, Fernando P. Perea, and Salvador Ruiz

9 Superovulation and fixed-time embryo transfer in Romosinuano cows using a short protocol with Stimufol and equine chorionic gonadotropin
M. Y. López, A. Parlange, F. Sosa, M. E. Kjelland, and S. Romo

10 Single births after embryo transfer of two IVP ovine embryos (fresh and frozen) diagnosed as twin pregnancies
H. Álvarez-Gallardo, A. Velázquez-Roque, M. E. Kjelland, and S. Romo

11 Fertility characterization of slick hair Holstein cattle
V. M. Negron-Perez and A. Aponte-Zayas

12 The *in vitro* production of Gyr × Jersey bovine embryos from oocytes collected via ovum pickup for use in the tropics
L. J. Zimmerman, E. A. Bangert, R. A. C. Rabel, D. J. Milner, P. V. Marchioretto, C. A. Allen, and M. B. Wheeler

13 Evaluating reproductive performance benchmarks and determining factors influencing reproductive performance in smallholder beef cattle farms

M. Nkadimeng, E. van Marle-Köster, M. L. Mphaphathi, F. V. Ramukhithi, and M. L. Makgahlela

14 Production and transfer of bovine embryos through the hub-and-spoke model: An innovative model to promote embryo transfer technology

S. S. Layek, S. Gorani, K. Karuppanasamy, S. P. Patil, S. Raj, K. B. Raval, S. Doultani, and P. Sharma

15 Enhanced core body temperature regulation reveals improved reproductive performance in the heat-tolerant Holstein cows

Z. Luo, J. Wang, Y. Xiao, Q. Zhang, S. Hou, Q. Liu, Y. Zhang, A. Jin, W. Liu, C. Yang, Y. Li, Z. Ju, Y. Gao, and J. Huang

16 Stillbirth, gestation length, and birth weights from Jersey calves originated from artificial insemination vs *in vitro* embryo transfer

D. G. B. Demetrio, T. Baumgartner, D. J. Amorim, M. Oliveira, M. E. Rosales, C. G. B. Demetrio, and R. M. Santos

17 Does the stage of *in vitro*-produced embryos transferred on different days of estrus affect pregnancy outcomes?

M. E. Rosales, M. Oliveira, R. M. Santos, and D. G. B. Demetrio

Cloning/Nuclear Transfer

18 Development of interspecies somatic cell nuclear transfer (iSCNT) caprine-bovine embryos injected with demethylase mRNA and mitochondrial extract

L. Adams, Y. Liu, T. Patrick, E. Grow, E. Ruggeri, B. Durrant, and I. Polejaeva

19 Tetraploid complementation and embryo aggregation improve the blastocyst rates of yak heterospecific somatic cell nuclear transfer embryos

M. Y. Felipe, V. Alberio, and D. F. Salamone

20 Growth kinetics and single-cell cloning capability of skin cell fibroblasts in dromedary camel (*Camelus dromedarius*)

C. Liu, P. Kumar, and Nisar Wani

Companion CANDES

21 Investigating the role of serum progesterone, estrogen, and testosterone in cyclic and acyclic black rhinos

P. M. Pennington, E. Donelan, L. A. Rispoli, C. Consago, and T. L. Roth

22 Transcriptomic analysis of granulosa cells in growing, dominant, and preovulatory follicles in the southern white rhinoceros (*Ceratotherium simum simum*)

K. Klohonatz, B. Durrant, and E. Ruggeri

23 An improved understanding of ovulation timing in two rhinoceros species (*Rhinoceros unicornis, Ceratotherium simum simum*): Ultrasound examination of preovulatory follicles before and after ovulation induction

J. D. Gillis, K. A. Donnelly, R. S. McCann, L. C. Metrione, T. T. Zachariah, J. K. O'Brien, and M. A. Stoops

24 The pros and cons of urethral catheterization for semen collection in rhinos

L. A. Rispoli, P. M. Pennington, E. Donelan, and T. L. Roth

25 *In vivo* gene expression analysis of southern white rhinoceros (*Ceratotherium simum simum*) granulosa cells collected from growing, dominant, and preovulatory follicles after ovum pickup

E. Ruggeri, J. Rodriguez, L. Fallon, M. Orsolini, and B. Durrant

26 Isothermal collection of bison semen in wild conditions
C. M. James, S. X. Yang, J. Singh, K. Rajapaksha, and G. P. Adams

27 Growth factor receptors in *in vitro*-produced bison and bovine embryos
C. Acevedo, S. Rajput, Y. Yuan, R. Krisher, N. G. Menjivar, A. Gad, and J. P. Barfield

28 Evaluation of cell-free DNA in spent holding media as a noninvasive technique for pre-implantation genetic diagnosis on *in vivo*-produced equine embryos
B. Middlebrooks, P. McCue, R. Grahn, and R. Bellone

29 Increase of genomic inbreeding at chromosome level affects differently the sperm head morphometrics shape in frozen–thawed stallion sperm
Julieta Moreno, Zahira Peña, Antonio Molina, and Sebastián Demyda-Peyrás

30 Does size matter? Effect of sperm morphometric characteristics on the motility and swimming ability in stallion sperm samples
Z. Peña, J. Moreno, A. Molina, and S. Demyda Peyrás

31 The importance of testing cryoprotectants when developing a sperm-freezing protocol for squamates
C. Young, N. Ravida, and B. Durrant

32 The efficiency of an adapted bovine IVF protocol to produce *in vitro*-derived embryos from oocytes collected via surgical ovum pickup from live white-tailed deer (*Odocoileus virginianus*) donors under captivity in central Illinois
E. Bangert, C. Shipley, R. Rabel, E. Garrett, D. Milner, P. Marchioretto, K. Spencer, C. Allen, and M. Wheeler

33 Domestic cat embryos cultured without the zona pellucida have an altered protein pattern at the blastocyst stage
D. Veraguas-Dávila, C. Zapata-Rojas, D. Caamaño, D. Saéz-Ruiz, F. Saravia, F. O. Castro, and L. Rodriguez-Alvarez

34 Effects of sericin supplementation on *in vitro* maturation of feline oocytes
J. Velasquez Vasquez, F. Correa Monsalve, S. Sanchez Somez, A. Carrillo Gomez, V. Dominguez, V. Torres, O. V. Arboleda, R. Urrego, and M. Duque Rodriguez

35 Koala sperm induces bovine oocyte activation after intracytoplasmic sperm injection
P. D. Palacios Benitez, N. Duncan, A. Nilesh Haldankar, S. Johnston, and A. Gambini

36 Comparative proteomic analysis of the extracellular vesicles secreted by the oviduct of turkey hens *in vivo* and in *in vitro* cultured oviductal cells
M. Rubilar, P. Poblete, Y. S. Wong, D. Caamaño, C. Aguilera, M. Briones, L. L. Rodriguez, and F. O. Castro

Cryopreservation/Cryobiology

37 Liquid preservation of bovine *in vivo*-derived embryos under field conditions
E. Wolf (née Sosnina), Hans-Peter Nohner, and Christine Wrenzycki

38 Sperm selection improves the quality of bovine epididymal spermatozoa cryopreserved by slow and ultrarapid freezing
A. C. Morocho, K. E. Delgado, M. Duma, G. F. Bermudez, D. A. Galarza, J. X. Samaniego, M. S. Mendez, M. E. Soria, and F. P. Perea

39 The effect of the supplementation of type III antifreeze protein on cryotolerance of bovine *in vitro*-produced blastocysts
M. Sakatani, M. Miwa, and K. Kubota

40 Bovine embryo survival of cryopreservation detected through analysis of real-time video
R. Killingsworth, C. Hayden, S. Hickerson, J. Webb, and J. Gibbons

41 Evaluation of two-stage delipidation on bovine embryo development and cryotolerance.
C. W. Wu and S. H. Cheong

42 Influence of oocyte grade on bovine *in vitro* embryo production and post-thaw viability
C. John, A. Jubashi, E. Xiao-Kim, and J. P. Barfield

43 Effect of Resveratrol on cryopreservation of bull spermatozoa by conventional slow freezing or ultrarapid freezing
J. Jaramillo-López, N. Amón-Togra, B. Aguirre-Narea, B. Campoverde-Guailacela, M. Duma, J. X. Samaniego, and D. A. Galarza

44 Potential of extracellular vesicles to improve capacitation of bull sperm *in vitro*
B. Dunn, M. Meyers, M. Jung, J. Graham, and F. Hollinshead

45 Frozen–thawed embryo transfer: Effects of embryo thawing protocol on pregnancy per embryo transfer in Nelore (*Bos indicus*) cattle recipients
C. J. Arreseigor, M. A. Gutiérrez-Reinoso, B. Driedger, R. Stahringer, and M. Garcia-Herreros

46 Evaluation of viability, hatching, and apoptosis of slow frozen and vitrified *in vitro* produced buffalo embryos
J. Prajapati, R. Patel, A. Sharma, D. Jhala, V. Suthar, M. Joshi, D. Patil, and C. Joshi

47 Influence of olive extracts on buffalo semen quality following cryopreservation
M. P. Benitez Mora, R. Esposito, F. Piscopo, F. Mendoza, M. A. Kosior, G. A. Presicce, F. L. Fedele, A. Sicari, and B. Gasparrini

48 Effect of different cryoprotectants and slow freezing on viability of Saiga (*Saiga tatarica*) fibroblasts
T. Nurkenov, Y. Toishibekov, Y. Grachev, A. Grachev, Y. Baidavletov, S. Kantarbayev, B. Katubayeva, and D. Toishybek

49 Viability of snow leopard (*Panthera uncia*) fibroblasts after vitrification
Y. M. Toishibekov, D. Y. Toishybek, T. T. Nurkenov, A. A. Grachev, B. S. Katubayeva, S. Bespalov, M. Bespalov, and R. V. Jashenko

50 Comparing different semen extenders based on post-thaw sperm motility, kinetics, and quality of caprine semen
B. Hirsch, B. Scott, S. Zoca, and J. Rich

51 Comparison of proAKAP4 concentrations with motility parameters between fresh and post-thaw Asturcon ponies semen cryopreserved with two different extenders
M. Dordas-Perpinyà, I. Yanez-Ortiz, N. Sergeant, J. Catalan, C. Tamargo, C. O. Hidalgo, A. Fernandez, M. Delehedde, J. Miro, and L. Briand-Amirat

52 Vitrification of equine germinal vesicle oocytes: An ongoing challenge
P. M. Gugole, E. Iacono, and B. Merlo

53 Vitrification of canine epididymal spermatozoa in semen straws: Effects of volumes on post-thaw motility
J. Mason, O. Nderi, J. Linn, and G. Wirtu

Developmental Biology

54 Evaluation of uterine capacity during late gestation in young commercial females over the past twenty years
J. Miles and L. Rempel

55 Parturition in cattle: Predictors and hormonal profile
P. L. J. Monteiro, W. S. Frizzarini, E. M. Cabrera, J. P. N. Andrade, S. Schoenfeld, R. R. Domingues, L. L. Hernandez, and M. C. Wiltbank

56 Morphokinetic variability of bovine blastocysts in repeated ovum pickup-IVF production

A. de Paula Reis, D. Le Bourhis, S. Lancelin, H. Raoul, V. Cotil, L. Le Berre, G. Crozet, A. Trubuil, V. Duranthon, and P. Salvetti

57 The effect of prematuration culture using C-type natriuretic peptide and extracellular vesicles recovered from follicles at different stages of development on oocyte chromatin compaction and embryonic development in bovine species

G. M. Mingoti, G. B. Nunes, C. R. Silva, J. C. P. Ferreira, R. A. Ferrazza, F. F. Franchi, N. M. Bastos, P. M. S. Rosa, and J. C. Silveira

58 Derivation and characterization of porcine endometrial organoids and their effects on the embryonic development

I. M. Saadeldin, A. Han, B. Seonggyu, H. Kang, S. Lee, and J. Cho

60 Evaluation of the production of cloned embryos by interspecies nuclear transfer (bovine-sheep)

N. Manzanares, I. Aguilar, S. Romo, J. R. Vázquez, A. Trejo, D. A. Ambriz, and M. C. Navarro

61 Maternal-embryonic knockout of murine Med12 disrupts trophoblast differentiation

M. Halstead, J. Goad, O. Febbo, P. Mittal, and A. Rajkovic

62 Comparison of N6-methyladenosine modification of mRNA during the bovine and murine oocyte to embryo transition

A. F. Ermisch and J. R. Wood

63 Identifying extracellular vesicles coupled miRNA sequence motifs and their regulatory RNA binding proteins in bovine reproductive cells

A. Gad, N. G. Menjivar, and D. Tesfaye

64 Is the proteome of the oviductal fluid in dairy cows affected by heat stress?

A. Assel, U. Besenfelder, K. Wagener, J. Allram, M. Tekin, C. Vogl, M. Drillich, and V. Havlicek

65 Functional ablation of pregnancy-associated glycoprotein 7 affects attachment and growth of trophectoderm cell lines

E. Moreno, M. S. Ortega, and K. G. Pohler

66 Developmental potential of single blastomeres within individual embryos presenting bipolar or multipolar divisions

A. Fernández-Montoro, T. De Coster, D. Angel-Velez, Y. Zhao, K. Smits, J. R. Vermeesch, and A. Van Soom

67 Deciphering the dialogue between the early bovine embryo and the oviduct: Comparison of extracellular vesicle proteins from an *ex vivo* model and an *in vivo* environment

R. Mazzarella, J. M. Sánchez, B. Fernández-Fuertes, S. G. Egido, A. Álvarez-Barrientos, E. G. Jiménez, J. M. Falcón-Pérez, M. Azkargorta, F. Elortza, M. E. González Martinez, P. Lonergan, and D. Rizos

68 Characteristics of guinea pig oocytes at two stages of the estrous cycle on lipid distribution and apoptosis rate

A. P. Pazmiño, E. F. Pangol, J. X. Samaniego, D. A. Galarza, L. E. Ayala, P. Villamediana, F. P. Perea, and S. Ruiz

69 Parental aneuploidy determines type of chromosome error

J. Davis, B. McCallie, and M. Katz-Jaffe

70 Possibility for genomic evaluation using single blastomeres derived from 8-cell stage IVP embryos in Japanese Black cows

H. Yoshioka, N. Sasago, K. Uchiuyama, K. Yoshinari, S. Miyashita, C. Oota, S. Kanda, M. Takeda, T. Kojima, and S. Matoba

71 Effect of seminal plasma and hCG on biochemical composition of oviduct and embryo quality on Day 3 after induction of ovulation in alpacas (*Vicugna pacos*)

W. Huanca, C. Ahuanari, F. Hilari, and A. Cordero

Early Pregnancy

72 Validation of an early open cow test based on lack of detection of interferon-tau: Got OCT?
Thomas R. Hansen, Jeanette V. Bishop, Aydin Guzeloglu, Tom Scheller, Carolina L. Gonzalez-Berrios, and Hana Van Campen

73 The use of epitope-tagged flotillin 1 to identify trophoblast cell secreted extracellular vesicles
S. L. Pratt, R. V. Anthony, R. Delorme, and N. M. Long

74 Relationship between the corpus luteum blood perfusion on 22 days after timed artificial insemination and pregnancy loss in precocious Nelore cows and heifers.
G. Pugliesi, A. Silva, S. Souza, P. Andrade, O. Escobar Junior, and R. Peres

75 A two-step protocol for the generation of a three-dimensional implantation model *in vitro*
S. Arcuri, G. Pennarossa, F. Gandolfi, and T. A. L. Brevini

76 Transcriptional profiles and signaling pathways associated with the SLICK1 allele of the prolactin receptor gene in Holstein cattle
M. Altman, M. B. Rabaglino, and A. Denicol

77 Evaluation of sexed semen on conception and pregnancy loss rates in synchronized *Bos indicus*, *Bos taurus-indicus*, and *Bos taurus* cows following timed artificial insemination
T. L. Mashilo, M. L. Mphaphathi, A. Maqhashu, M. R. Ledwaba, M. A. Thema, M. D. Sebopela, and T. C. Chokoe

78 Regression of an accessory corpus luteum during pregnancy affects placental function in lactating dairy cows
D. Van Bui, S. Haneda, and M. Matsui

79 Effect of intramuscular gonadotrophin-releasing hormone prior to and after conceptus attachment on pregnancy survival in lactating dairy cows
A. Santos, T. Minela, J. Branen, and J. R. Pursley

Embryo Culture

80 EmbryoCHIP: A new microfluidic device for *in vitro* pre-implantation embryo development
P. Fontes, R. Franko, G. Ferronato, M. Milazzotto, and M. Ferraz

81 Maternal extracellular vesicles from *in vitro* and *in vivo* system have different impact in pre-implantation bovine embryos development
C. Aguilera, A.E. Velasquez, Y. Wong, M. A. Gutierrez-Reinoso, J. Cabezas, B. Melo-Baez, D. Caamaño, F. O. Castro, and Ll Rodriguez-Alvarez

82 Evaluation of ovine *in vitro* embryo production using frozen–thawed semen from dominant and subordinate rams
A. Velázquez-Roque, H. Álvarez-Gallardo, K. Mauleón, F. Sánchez-Dávila, M. E. Kjelland, and S. Romo

83 Factors associated with *in vitro* embryo production in beef cattle
R. Sartori, M. Balistrieri, C. Consentini, P. Cortat, M. G. Neto, D. Gaitkoski, M. Oliveira, and C. R. Bruner

84 Characterization and effect of endometriosomes on the development and quality of pre-implantation bovine embryos
E. Muñoz-Acuña, V. Huaiquimil-Sepulveda, F. Pérez-García, F. Fuentes-Zapata, R. Felmer, and M. E. Arias

85 Impact of nobiletin supplementation of culture medium on gene expression patterns of *in vitro*-produced pig embryos
Y. N. Cajas, K. Cañon-Beltran, C. Nuñez-Puente, M. G. Milan de la Blanca, R. Mazzarella, A. Gonzalez-Plaza, M. E. Gonzalez, H. Rodriguez-Martinez, D. Rizos, and C. A. Martinez

86 Development of porcine embryos cultured in media irradiated with ultraviolet at 228 and 260 nm wavelengths

N. Torigoe, M. Aihara, Q. Lin, K. Takebayashi, B. Liu, M. Nagahara, and T. Otoi

87 Determining the impact of CO_2 concentration and pH on mouse pre-implantation embryo development

H. Rogers, W. Schoolcraft, Y. Yuan, and J. Swain

88 Co-culture with bovine oviduct epithelial cells during *in vitro* culture affects the bioenergetic profile of bovine expanded blastocysts

J. P. Kurzella, H.-H.r Eva, X. Tan, D. Salilew-Wondim, F. Rings, C. Blaschka, and M. Hoelker

89 Impact of bta-mir-483-3p carried within oviductal fluid's extracellular vesicles of pregnant cows on *in vitro* embryo development and quality

R. Mazzarella, Y. N. Cajas, K. Cañón-Beltrán, D. Gascón, C. A. Martinez, M. G. Millán de la Blanca, P. Beltrán-Breña, C. Nuñez-Puente, E. González, and D. Rizos

90 Lipid droplet accumulation in oocytes and embryos can be reduced by decreasing the use of fetal calf serum during *in vitro* maturation, without compromising subsequent blastocyst rates

Leticia Martins, Luany Martinhão, Ismael Garcia, Djonata Ribas, Otavio Faria, João Gabriel Grázia, and João Henrique Viana

91 Photobiomodulation of bovine zygotes at 21 hours postfertilization

L. Thomason, C. Wilhelm, A. Mandel, K. Kirkman, K. D. Richey, H. Culler, M. J. Hersom, and C. M. Checura

92 Boosting *in vitro* bovine blastocyst production via intermittent administration of nicotinamide

M. El-Sheikh, S.-H. Lee, A. Mesalam, and I.-K. Kong

93 Phosphoenolpyruvate carboxykinase supports bovine embryo development in the absence of carbohydrates

K. Fresa, A. Chicco, and E. Carnevale

94 Embryonic development and cryogenic viability of bovine IVP blastocysts under the impact of Mito-TEMPO

M. Schreiber, J. Kurzella, D. Salilew-Wondim, D. Teuteberg, C. Blaschka, and M. Hoelker

95 Culture medium with reduced nutrient concentrations alters the mTORC1 and AMPK pathway activities in bovine blastocysts

M. Zhang, E. Jannaman, M. Hao, Z. Jiang, R. Krisher, W. Schoolcraft, and Y. Yuan

96 Comparative study of the morphokinetic parameters of embryos produced *in vitro* with sex-sorted vs unsorted bovine sperm

I. Serbetci, C. Herrera, M. Melean, M. Steiner, M. Siuda, S. Holden, E. Malama, S. Butler, and H. Bollwein

97 Raman microspectroscopy to characterize secondary structure of zona pellucida proteins of *in vitro* produced and *in vivo* derived bovine embryos

A. Brewer, E. Girka, J. H. Pryor, K. R. Bondioli, and C. R. Looney

98 Capturing the miracle: Time-lapse imaging of equine embryos reveals cleavage patterns impact pregnancy success

S. Martin-Pelaez, A. de la Fuente, S. Meyers, and P. Dini

99 Effects of unfertilized oocytes and blastocysts in the culture environment on cleavage and blastocyst developmental rates of bovine *in vitro* embryos

J. Looman, S. Hickerson, and J. Gibbons

Embryo Manipulation

100 Resveratrol reduces oxidative stress after a six-hour incubation of *in vivo*-derived sheep embryos
M. P. P. Guimarães, T. A. Oliveira, G. R. Leal, N. O. Barbosa, J. F. Fonseca, F. Z. Brandão, L. F. L. Correia, and J. M. G. Souza-Fabjan

101 Selecting bovine embryos using genomics tools: Sex determination and genetic merit assessment in developing cattle embryos
S. Doultani, S. S. Layek, T. Gohil, A. Sudhakar, N. Nayee, V. S. Suthar, K. Karuppanasamy, S. Raj, S. Gorani, S. P. Patil, L. B. George, and H. N. Highland

102 Feasibility of using manually modified micropipettes for embryo biopsy in dromedary camels
F. Seyedasgari, B. Asadi, M. Yarmohammadi, and R. Ebadi

103 Quality and fertilization of frozen–thawed porcine spermatozoa separated using migration sedimentation
S. T. Nguyen, M. Taniguchi, S. Kaewma, M. Nagahara, M. Takagi, and T. Otoi

104 Developmental competence of single blastomeres from bovine 8-cell stage embryos in monozygotic multiple blastocyst production
H. Koyama, A. Khurchabilig, Y. Kimura, H. Nagai, and S. Sugimura

105 Improving embryo parthenogenetic development in pigs by blastomere exchange
F. A. Allegroni, O. Briski, M. Yauri Felipe, R. Fernandez-Martin, L. Ratner, G. La Motta, and D. F. Salamone

106 Intergeneric hybrid embryo (*Bos taurus* x *Bubalus bubalis*) with trophoblast complementation
V. Gorleri, M. F. Yauri, and D. F. Salamone

Embryo Transfer

107 Selecting donors for ovum pickup using anti-Mullerian hormone in cattle: A potential biomarker for donor selection
P. Sharma, S. S. Layek, K.K. Hadiya, S. Gorani, K. Karuppanasamy, S. P. Patil, S. Raj, and K. B. Raval

108 Pregnancy rates to embryo transfer in lactating *Bos indicus* x *Bos taurus* dairy cows synchronized with a new gonadotropin-releasing-hormone based protocol with lengthened proestrus
A. V. Cedeño, F. Paucar, L. Pinargote, B. Mendoza, V. Ocampo, G. Romero, and G. A. Bó

109 *In vitro* embryo production in *Bos indicus* donors super-stimulated with equine chorionic gonadotrophin or FSH prior to ovum pickup
V. Ocampo, A. V. Cedeño, B. Mendoza, L. Pinargote, G. Romero, and G. A. Bó

110 Pregnancy rates in *Bos indicus* x *Bos taurus* recipients synchronized with a GnRH/progesterone-based or an estradiol/progesterone-based protocol with prolonged proestrus
G. A. Bó, F. Paucar, B. Mendoza, L. Pinargote, V. Ocampo, and A. V. Cedeño

111 From abattoir-derived oocytes to *in vitro*-produced embryos: Pathogen surveillance and washing procedures
J. N. Kincade, E. Xiao-Kim, J. P. Barfield, and A. Bosco-Lauth

112 Treatment with 325 mg of recombinant bovine somatotropin at the time of embryo transfer increase pregnancy rate of *in vitro* transfer in Holstein heifer recipients
L. M. Rebeis, D. Demetrio, M. Oliveira, M. E. Rosales, B. L. C. Catussi, S. Albertini, and P. S. Baruselli

113 Volume of medium used for intrafolicular transfer of immature oocytes impacts its results.
O. Faria, N. Kussano, L. Faria, L. Martins, and M. Dode

114 Effect of length of progesterone device administration during a modified CO-Synch for fixed-time embryo transfer in heifers

T. Reamsnyder, R. V. Sala, A. Pinete-Gonzalez, E. Maldonado, I. Robles-Morado, S. D. L. C. Martinez, V. A. Absalon-Medina, V. C. Fricke, R. I. Juarez-Dorantes, P. J. Ross, J. F. Moreno, J. C. L. Motta, and A. Garcia-Guerra

115 Video data reveals bovine embryo stress in response to fluctuations in ambient room temperature

C. Wells, M. Rea, C. Hayden, and R. Killingsworth

116 Evaluation of frozen–thawed bovine embryos before and after 24-hour culture

S. Hickerson, J. Looman, R. Killingsworth, and J. Gibbons

117 Extracellular vesicles from endometrial fibroblasts exposed to a chronic inflammation stimulus induce an up-regulation of fibrotic related genes in mare endometrial epithelial cells

Y. S. Wong, A. C. Mançanares, F. Navarrete, P. Poblete, L. Mendez, L. L. Rodriguez, and F. O. Castro

118 Superovulatory response and embryo production in beef cows treated with a recombinant human FSH

E. Ponte, J. A. Sola, A. Tribulo, J. M. Oviedo, P. Tribulo, D. Beltramo, R. J. Tribulo, and H. E. Tribulo

119 Use of lactating females with nursing calves as recipients in an embryo transfer program in camel (*Camelus dromedarius*)

H. Abouhefnaway and N. A. Wani

120 Fetal development in lactating dairy cows following timed embryo transfer with *in vitro*-produced embryos derived from conventional or sex-sorted sperm

L. Thompson, E. M. Murphy, M. McDonald, M. B. Rabaglino, A. D. Crowe, S. T. Butler, and P. Lonergan

121 Inclusion of probiotics in the maternal diet modulates reproductive microbial composition

J. Sola, F. Alustiza, J. Manes, G. R. Alonso, S. Bocco, P. Florit, M. Pino, and P. Tríbulo

122 Fertility in lactating dairy cows following timed embryo transfer with fresh *in vitro*-produced embryos derived from conventional or sex-sorted sperm

E. M. Murphy, A. D. Crowe, L. Thompson, S. G. Moore, M. McDonald, E. Hordern, B. Bertholdi, F. Randi, E. Rojas Canadas, P. Lonergan, and S. T. Butler

123 Identification of transcriptome markers for bovine embryo quality

A. Guzeloglu, J. V. Bishop, H. M. Georges, M. A. Marquez, N. Menjivar, T. R. Hansen, and J. P. Barfield

124 Analysis of the factors affecting the pregnancy rate in cows implanted with transferred Zebu cattle embryos produced *in vitro*

A. Zavaleta, B. Dominguez, A. Hernandez, M. Alpirez, P. Cervantes, and M. Barrientos

125 Effects heat waves on the rate pregnancy in bovines, from local breeds, receiving embryos produced *in vitro* in a transferency program in tropicals areas in Mexico

M. Barrientos, B. Dominguez, A. Hernadez, A. Riaño, P. Cervantes, and A. Zavaleta

126 Embryo transfer medium supplemented with bovine plasminogen increases zona pellucida diameter and decreases thickness

A. P. Snider, R. A. Cushman, E. C. Wright-Johnson, M. S. Crouse, J. R. Miles, and A. R. Menino Jr.

127 Pregnancy improvement following transfer of parthenogenetic embryos after artificial insemination in dairy cows is dependent on interval from calving

D. Priestley, E. Arter, I. Threlfall, W. Y. Kwong, R. J. Simmons, and K. D. Sinclair

128 Embryo transfer in Brangus (*Bos indicus* × *Bos taurus*) cattle recipients: Effects of sire on pregnancy rate using *in vitro*-produced embryos

M. A. Gutiérrez-Reinoso, C. J. Arreseigor, B. Driedger, R. Stahringer, and M. Garcia-Herreros

129 Activation of membrane progesterone receptors induces glycogenolysis in uterine epithelial cells
M. Berg and M. Dean

130 Moon cycle influences pregnancy rate and pregnancy losses following transfer of bovine embryos produced *in vitro*
F. P. Perea, H. J. Hernandez-Fonseca, A. M. Cambraia Esteves, J. L. Lobo Alves Correia, A. C. Nogueira, and P. C. Villamediana-Monreal

Epidemiology/Diseases

131 Relationship between subclinical endometritis diagnosis and spontaneous recovery in lactating cows
E. Frana Bisang, P. R. Marini, and M. I. Vázquez

132 Development of a porcine model for the testing of the RapidVent emergency ventilator for the treatment of COVID-19 infection
S. A. Womack, E. B. Bethke, W. P. King, D. J. Milner, M. Rubessa, P. V. Marchioretto, and M. B. Wheeler

133 DNA methylation level of vulnerable genomic loci associated with large offspring syndrome
H. Nava-Trujillo and R. M. Rivera

134 Effectiveness of the timing of trypsin washing to remove pathogens from *in vitro*-produced bovine embryos at different stages of development
E. Xiao-Kim, J. Kincade, A. Bosco-Lauth, and J. P. Barfield

135 Enhancing livestock resilience: Epigenetic diversity in bovine
L. Bouzeraa, H. Martin, C. Plessis, and M.-A. Sirard

136 Reducing the incidence of postpartum bovine metritis by administration of mycobacterium cell wall fraction immunostimulant in a high-producing Holstein dairy herd
P. L. Medrano Rueda and J. M. Palomino

Fertilization/ICSI/Activation

137 Enhancing blastocyst formation rate using bovine freeze-dried sperm: Investigation of oocyte activation and sperm pretreatment
K. Matsukawa, K. Shimojima, T. Kameda, T. Oikawa, K. Ogata, K. Takeda, S. Akagi, and K. Edashige

138 Evaluation of dimethyl sulfoxide and ethylene glycol on fertilization rate of pig oocytes
T. T. Maduwa, M. L. Mphaphathi, and T. L. Nedambale

139 Does centrosome malposition and fragmentation predispose to chromosome mis-segregation during the first mitotic division of equine intracytoplasmic sperm injection zygotes?
T. A. E. Stout, V. F. C. Scheeren, A. Larreategui, M. Beitsma, C. Deelen, F. O. Papa, A. N. Claes, and M. de Ruijter-Villani

140 Subcellular localization of phospholipase C zeta 1 in stallion sperm
R. Gonzalez-Castro, L. Withcomb, E. Pinsinski, and E. Carnevale

141 Enhanced developmental potential of bovine embryos generated by piezo-intracytoplasmic sperm injection with sorted capacitated spermatozoa by fluorescence-activated cell sorting
M. Castro, L. Aguila, M. E. Arias, and R. Felmer

142 Evidence against the role of Toll-like receptors 7/8 in sex selection in the mouse
R. Zhao, J. Liu, B. Wang, and X. Tian

143 Embryo transfer of embryos generated by intracytoplasmic sperm injection
L. Gatenby, A. Brewer, C. Looney, and K. R. Bondioli

144 Correlation between sperm characteristics and *in vitro* fertilization outcomes in frozen-thawed boar semen supplemented with glutathione and dithiothreitol
M. R. Ledwaba, M. L. Mphaphathi, M. A. Thema, C. M. Pilane, T. C. Chokoe, and T. L. Nedambale

Folliculogenesis/Oogenesis

145 Functional genomics uncovers the impact of heat stress in a mouse model of oocyte growth
M. Tigre Moura, C. Alencar Imaeda-Carvalho, F. R. Oliveira de Barros, F. Mossa, D. Bebbere, and F. Freitas Paula-Lopes

146 Evidence for a role of a noradrenergic influence on nerve growth factor–induced luteinising hormone secretion in llamas
R. A. Carrasco, S. Pezo, K. D. Hutt, and G. P. Adams

147 Characteristics of guinea pig oocytes (*Cavia porcellus*) at two stages of the oestrous cycle on glucose-6-phosphate dehydrogenase activity and oocyte diameter
J. X. Samaniego, K. M. Castro, E. F. Bravo, D. A. Galarza, L. E. Ayala, P. Villamediana, F. P. Perea, and S. Ruiz

148 Microaspiration-assisted electrical impedance spectroscopy used for characterization of bovine oocytes during *in vitro* maturation
A. Fries, Y. Cao, J. Floehr, U. Schnakenberg, and C. Wrenzycki

149 Molecular pathways associated with oocyte growth in cattle
L. Barbosa Latorraca, A. Galvão, G. Kelsey, J. D'augero, M. B. Rabaglino, and T. Fair

150 The protective role of quercetin supplementation in bovine granulosa cells against thermal stress
G. G. Ramirez, A. Gad, N. G. Menjivar, and D. Testaye

151 Comparison of prostanoid concentrations in pig plasma and follicular fluid
S. Barnes, E. Mas, T. Rozek, T. Durand, J. Galano, C. Oger, J. Kelly, R. Kostecki, and E. Noschka

152 Influence of diarylheptanoid supplementation from *Curcuma comosa* extract on Ki67 and estrogen receptor alpha expression in goat ovaries
C. Kanjanaruch, T. Bumma, J. Nabthonglang, N. Suayroop, S. Niyomprapasakun, B. J. Davila Ruiz, P. P. Borowicz, L. P. Reynolds, and C. Navanukraw

153 Enhanced extracellular vesicle–mediated delivery of stress-associated miRNAs in bovine granulosa cells
N. G. Menjivar, A. Gad, and D. Tesfaye

154 Characterization of anovular phenotypes in postpartum beef cows
A. E. Crist, J. C. L. Motta, C. B. Hayden, C. Rykaczewski, M. M. Mussard, and A. Garcia-Guerra

Genetic Engineering

155 Human proinsulin and insulin production in the milk of transgenic cattle
P. S. Monzani, J. R. Sangalli, R. V. Sampaio, S. Guemra, R. Zanin, P. R. Adona, M. A. Berlingieri, L. F. C. Cunha Filho, I. Y. Mora-Ocampo, C. P. Pirovani, F. V. Meirelles, O. Ohashi, and M. B. Wheeler

156 Genome editing of porcine zygotes through the lipofection of a CRISPR/Cas9 system with two guide RNAs
Q. Lin, K. Takebayashi, N. Torigoe, B. Liu, M. Hirata, M. Nagahara, and T. Otoi

157 Production of β-lactoglobulin gene knockout blastocyst stage embryos of Indian water buffalo using CRISPR and somatic cell nuclear transfer technology
A. Tara, P. Singh, D. Gautam, G. Tripathi, S. Malhotra, S. De, M. K. Singh, and N. L. Selokar

158 Effect of a custom-designed transfection buffer on transfection rates and gene editing success in fibroblast cells of buffalo, cattle, goats, and sheep
S. Malhotra, P. Singh, A. Tara, D. Gautam, R. Parsad, G. Tripathi, S. De, M. K. Singh, and N. L. Selokar

159 Stable germline transmission of multiple gene-edited bulls for precision breeding
D. H. Kwon, K. H. Eom, G. M. Gim, B. J. Jeon, J. Y. Choi, D. J. Jung, D. H. Kim, J. K. Yi, J. J. Ha, J. H. Lee, S. R. Han, S. B. Lee, S. Y. Yum, W. W. Lee, and G. Jang

160 Identification of bovine myostatin core promoter and its application for transgenesis *in vitro*
K. H. Eom, D. H. Kwon, Y. C. Kim, S. Y. Yum, and G. Jang

Male Physiology

161 Anti-Müllerian hormone concentration as a predictor of puberty in male Brahman and Simmental bulls
R. Maculan, J. A. S. Viafara, G. de Vasconcelos, G. Moreira, C. Vanin, N. Alves, M. B. D. Ferreira, and J. C. de Souza

162 Differences in microRNA cargo of low-fertility bull spermatozoa before and after incorporation of extracellular vesicles isolated from proven fertilty bulls' seminal plasma
A. Lange Consiglio, G. Gaspari, E. Capra, M. Cretich, R. Frigerio, and F. Cremonesi

163 Scrotal circumference in young Brahman and Nellore bulls
J. Chacón and E. Vindas-Van der Wielen

164 Isolation, identification and quality assessment of bovine round spermatids
R. Pasquariello, F. Di Filippo, T. A. L. Brevini, and F. Gandolfi

165 Novel insights into pubertal South African indigenous *Ovis aries* males
R. N. Shingange, F. V. Ramukhithi, and A. Maqhashu

166 Assessment of testicular echotexture in Nelore bulls: Implications for puberty evaluation
B. Lima Chechin Catussi, R. Germano de Rezende, P. Nacib Jorge Neto, E. Gricio, A. Echegaray, L. Nataly Garcia-Oliveros, E. C. Carvalho Celeghini, and P. Sampaio Baruselli

167 Exploring the potential of Raman spectroscopy to discriminate boar semen samples during storage
S. L. Kameni, B. Semon, G. O. Ariunbold, and J. M. Feugang

168 The relationship between age, ossicone volume, and testosterone concentration for prediction of sexual maturity in wild South African giraffes
F. Deacon, A. Maqhashu, I. Luther-Binoir, W. Daffue, K.-H. Storbeck, M. Stander, and F. B. Bercovitch

169 CRISP-2 protein and antioxidant enzymes of seminal plasma are positively related to the quality of donkey semen
J. D. Montoya, A. Usuga, B. Rojano, and G. Restrepo

170 Effects of feeding male goats with sericea lespedeza and black seed meal on the quality of their cooled semen
S. C. Namani, R. S. Kolikapongu, R. Heikel, S. C. Chelkapally, A. Neha, A. Shaik, A. A. Pech-Cervantes, N. Whitley, B. Kouakou, T. Terrill, and A. R. Moawad

171 Microplastics are present in bull epididymal sperm and polystyrene bead affects bovine sperm inducing oxidative stress on embryos
N. Grechi, S. Devkota, G. Ferronato, and M. Ferraz

172 Untargeted metabolomic analysis of Zulu ram seminal plasma metabolome following selenium supplementation and their possibility as fertility biomarkers
K. P. M. Lekola and K. C. Lehloenya

173 Effects of aggregated protein content in sperm head on pre-implantation development of bovine embryos

E. Anta Galvan, K. Kerns, and S. Ortega

Oestrus Synchronization/Artificial Insemination

174 Pregnancy rate and pregnancy loss in precocious primiparous Nelore cows treated with injectable progesterone pre- or post-timed artificial insemination

A. Silva, S. Souza, P. Andrade, G. Bevenuto, O. Júnior, E. Cunha, H. Marques, I. Feltrin, T. Nishimura, R. Peres, I. Motta, and G. Pugliesi

175 Effect of estrus manifestation on follicular diameter, endometrial thickness, and circulating estradiol concentration in *Bos indicus* cows submitted to timed artificial insemination

L. Â. de Abreu, B. L. Chechin Catussi, A. Guimarães da Silva, T. Santos Resende, F. Kenji Mori, A. Ferreira Marques, A. Canêdo de Lima Silva, S. Albertini, L. Mattos Rebeis, G. Pugliesi, and P. Sampaio Baruselli

176 Luteolytic efficiency of a single or double dose of cloprostenol sodium in a 5-day artificial insemination protocol in dairy cows

I. Trevisan Roese, L. Lemos Fank, R. Douglas, R. Sartori, and J. Batista Borges

177 An active site of osteopontin restoring the endometrial epidermal growth factor profile and fertility in repeat breeder dairy cows

T. Tanida, T. Tagami, Y. Yanagawa, and S. Katagiri

178 Optimization of the time of insemination and presynchronization treatment in beef heifers submitted to fixed-time artificial insemination

A. Garcia-Guerra, J. C. L. Motta, A. E. Crist, N. P. Folchini, C. Rykaczewski, and S. Wellert

179 A simplified insemination protocol for frozen-thawed stallion semen stored for 24 hours after thawing

L. H. A. Morris, R. H. Harteveld, and Z. Gibb

180 Effects of different synchronization protocols on metabolic profile, progesterone levels, and reproductive performance of dairy goats

R. Sri Kolikapongu, S. Chandra Namani, A. Shaik, A. Neha, S. Chandan Chelkapally, M. Schauston, N. Whitley, B. Kouakou, and A. R. Moawad

181 Expression of estrus and fertility of different presynchronization strategies for fixed-time artificial insemination in suckled beef cows

N. P. Folchini, A. E. Crist, J. C. L. Motta, S. Wellert, C. Rykaczewski, M. Saad, A. C. Carranza Martin, and A. Garcia-Guerra

182 Effect of P.G. 600 dose on expression of estrus, fertility, and prolificacy in ewes synchronized out-of-season using a short-term progesterone-based protocol

M. Saad, B. J. Duran, C. Rykaczewski, J. D. Kieffer, A. Menchaca, and A. García-Guerra

183 Relationship of steroid hormone dynamics prior to artificial insemination and pregnancy establishment following estrus detection or Double-Ovsynch in lactating dairy cows

T. Minela, A. Santos, J. Branen, and J. R. Pursley

184 Effects of cetrorelix on the growth pattern of the dominant follicle and follicular wave emergence in cattle

D. R. Farmer, J. L. Campbell, G. P. Adams, C. E. P. Leonardi, and J. Singh

185 Effect of equine chorionic gonadotropin administration timing in fixed-time artificial insemination protocols on heifer's corpus luteum steroidogenic cells

R. Aragunde-Vieytes, Y. Perdomo, V. Urioste, N. Cabrera, R. Ferrer, J. P. Garzón, C. Larrañaga, J. M. Verdes, and G. Gastal

Oocyte Collection

186 Evaluating equine oocyte transportation techniques: A comparative study of maturation, cleavage, and blastocyst rates in Equitainer, MicroQ, and incubator systems

A. de la Fuente, S. Martin-Pelaez, S. Megehee, J. McNaughten, A. Rocha, M. Mendes, S. Burns, R. Holyoak, S. Meyers, and P. Dini

187 A review of the results of a commercial ovum pickup program for the production of equine embryos via intracytoplasmic sperm injection over the past nine breeding seasons; 2014–2022

E. Bradecamp, M. Schnobrich, C. Scoggin, P. Sheerin, S. Walbornn, A. Barhorst, A. Buchanan, S. Ramsey, A. Sheerin, and C. Howard

188 Effects of season and breed on *in vitro* beef embryo production and recipient pregnancy rate

B. F. Matos, G. P. Cadima, N. S. Reis, and R. M. Santos

189 Effect of the number of viable oocytes retrieved from Gyr donor cows on the efficiency of *in vitro* embryo production in a large-scale commercial program

H. J. Hernandez-Fonseca, A. M. Cambraia Esteves, J. L. Lobo Alves Correia, C. Nogueira, J. Atilio Aranguren-Mendez, J. M. Rodriguez, and F. P. Perea

190 Assessment of porcine follicle-stimulating hormone delivery mode before ovum pickup and *in vitro* embryo production in pregnant heifers

R. V. Sala, J. C. L. Motta, V. A. Absalon-Medina, V. C. Fricke, A. E. Crist, T. Reamsnyder, P. J. Ross, J. F. Moreno, and A. Garcia-Guerra

191 Anti-Müllerian hormone: How early can it be used as a biomarker for future *in vitro* embryo production in *Bos taurus* cattle?

J. C. L. Motta, A. C. Carranza-Martin, C. Rykaczewski, N. P. Folchini, M. Saad, C. Hayden, R. V. Sala, R. Bond, D. C. Pereira, P. J. Ross, and A. Garcia-Guerra

192 Microfluidics in assisted reproductive technologies: OoTrap for oocyte capture and *in vitro* maturation

R. Franko and M. De Almeida Monteiro Melo Ferraz

193 Effect of dominant follicle removal before ovum pickup in Girolando cattle

P. V. Marchioretto, S. L. Rodriguez-Zas, S. A. Womack, B. R. Lindsey, D. J. Milner, M. Rubessa, K. C. Wilson, and M. B. Wheeler

194 Effect of nobiletin on oocyte meiotic maturation in pigs

S.-H. Lee and X.-S. Cui

195 Nuclear progesterone receptor and mitochondria profiling during bovine oocyte growth

J. M. D'Augero, L. Barbosa Latorraca, M. B. Rabaglino, and T. Fair

Oocyte Maturation

196 Sustainable effect of heat stress during maturation on the bioenergetics profile of bovine blastocysts

E. Held-Hoelker, N. Ghanem, L. Haake, D. Salilew-Wondim, J. Kurzella, E. Tholen, C. Große-Brinkhaus, F. Rings, and M. Hoelker

197 The effects of pyridoxine supplementation during oocyte maturation on the *in vitro* production of pig embryos

A. Christy, C. Nau, M. Throop, and B. Whitaker

198 Seasonal effect of *in vitro* prematuration with follicular fluid and follicular fluid small extracellular vesicles on bovine oocyte developmental competence

B. Barcelona, A. Rodríguez, Z. Ramos, N. Rodríguez-Osorio, C. Viñoles, and F. Báez

199 Nanoplastics are incorporated by the bovine cumulus–oocyte complex and form a potential treat for oocyte competence

J. Yang, J. H. Kamstra, J. Legler, and H. Aardema

200 Effect of duration of *in vitro* maturation and cumulus–oocyte complex morphology on *in vitro* embryo production in wood bison

E. M. Pioltine, G. P. Adams, G. F. Mastromonaco, K. Rajapaksha, T. Watanabe, and J. Singh

201 The presence of corpus luteum affects gene expression in oocytes and cumulus cells after *in vitro* maturation in mares

D. A. Velasco-Acosta, A. Velasquez-Castellanos, V. Vargas-Laverde, D. L. Gomez-Lopez, and D. F. Dubeibe-Marin

202 Endoplasmic reticulum stress inhibitor supports *in vitro* growth and maturation of bovine oocytes

M. Nuronnabi Islam, M. Moniruzzaman, and K.-I. Yamanaka

203 Effects of oxygen level on bovine oocyte maturation and embryo development

K. Bennett, D. Beal, Y. Liu, T. Patrick, I. Bunderson, A. Moawad, and I. Polejaeva

204 Lipid profiling of bovine oocytes matured *in vivo* and *in vitro*

E. Girka, A. Brewer, E. Sheikh, M. R. Gartia, and K. R. Bondioli

205 Evaluating bovine *in vitro* oocyte maturation, H4K16 acetylation rates, and *in vitro* embryo production with nicotinic acid and resveratrol addition to the oocyte maturation medium of Angus breed cows

M. A. Lagares, J. R. D. Farias, N. C. Alves, and A. B. Vasconcelos

206 Graphene-oxide toxicity evaluation and its effects on porcine oocyte *in vitro* maturation

P. Ferré-Pujol, I. Ortiz-Anaya, Y. Zhou, and Y. Nishina

207 Anti-aging effect of follicular fluid exosome-like extracellular vesicles on bovine oocytes matured *in vitro*

G. N. Singina, E. N. Shedova, R. E. Uzbekov, and S. Uzbekova

208 Photobiomodulation during oocyte maturation enhances blastocyst rates but not blastocyst adenosine triphosphate content

H. Culler, K. D. Richey, and C. M. Checura

209 L-Carnitine supplementation during *in vitro* maturation reduces the oxidative stress of cat oocytes

G. Leal, A. P. Cupello, B. Xavier, M. Guimarães, T. Oliveira, N. Barbosa, A. L. Maia, B. Merlo, and J. Souza-Fabjan

210 Effect of carvacrol and sericin supplementation on *in vitro* maturation medium of porcine oocytes

F. Correa Monsalve, J. Velasquez Vasquez, S. Sanchez Gomez, A. C. Carrillo Gomez, V. Domingez, V. Torrez, G. Restrepo Betancur, B. A. Rojano, O. H. Velasquez Arboleda, R. Urrego, and M. Duque Rodriguez

211 Postponed *in vitro* fertilization timing improves cleavage competence in oocytes with slow-predicted nuclear maturation speed in Japanese Black beef heifers

T. C. Ho, N. Kawate, and K. Koyama

212 Mare aging affects metabolomic profile of oocytes and follicular cells at different maturation stages

G. D. Catandi, D. R. Sessions-Bresnahan, S. Peters, L. J. Maclellan, C. D. Broeckling, and E. M. Carnevale

213 Nuclear assessment of bovine oocytes matured in cytokine-supplemented medium using microtubule and DNA staining

R. Blocher, Y. Liu, and I. Polejaeva

214 Association between oocyte grade, markers of oocyte competence, and fertility traits in dairy cattle

B. Chasi, J. P. Andrade, P. L. J. Monteiro, E. Anta, E. S. Moreno Martinez, M. C. Wiltbank, F. Peñagaricano, A. Nourhan, A. Balboula, and M. S. Ortega

215 Effects of serum-free maturation medium and resveratrol supplementation on ovine oocyte maturation and quality

I. Bunderson, Y. Liu, and I. Polejaeva

216 Metabolomic and proteomic profiles of bovine follicular fluid during the window of *in vivo* oocyte maturation
S. Salman, O. Gungor, S. Ranjitkar, D. Zhang, J. Balsbaugh, J. Liddle, F. Zaidi, P. Ramamoorthy, and C. Tian

Periconceptional/Fetal Programming

217 Consequences of variation in methionine concentration on development of the bovine embryo *in vitro*
M. Sagheer and P. J. Hansen

218 A blood transcriptomic signature predicts the expression of energy-regulatory genes altered in the skeletal muscle of 3-month-old dairy heifers conceived by *in vitro* fertilization
M. Rabaglino, A. Crowe, S. Moore, S. Butler, and P. Lonergan

219 Serum levels of interleukin-10 and progesterone post-mating in alpacas (*Vicugna pacos*)
H. Dellepiane-Gil, C. Mamani, S. Morales-Cautí, M. Machaca, and W. Huanca

Stem Cells

220 Strontium enhances *in vitro* osteogenic differentiation of porcine adipocyte–derived stem cells
J. R. Glassey, R. A. C. Rabel, D. J. Milner, and M. B. Wheeler

221 Isolation and characterization of mesenchymal stem cells from adipose tissue for their application on regenerative therapies in wild avian species
F. T. Perez Profeta, M. B. Ceballos, A. J. Sestelo, A. A. Mutto, and M. Navarri

222 Tankyrase inhibition suppresses expression of Hippo signaling pathway components in bovine embryonic stem cells
Y. Xiao, Y. Wang, Y. Zhang, X. Wang, Z. Ju, J. Wang, C. Yang, Y. Gao, and J. Huang

223 Wharton's jelly mesenchymal stromal/stem cell–derived conditioned medium effect on equine endometrial cell viability
C. Del Prete, G. Gaspari, M. A. Kosior, G. Maculan, B. Merlo, E. Iacono, N. Cocchia, B. Gasparrini, and A. Lange Consiglio

224 Analysis of the antifibrotic capacity of equine mesenchymal stem cell secretome from adipose and endometrial origin conditioned with PGE2 on myofibroblast
L. Mendez, Y. S. Wong, D. Caamaño, A. C. Mançanares, F. Navarrete, P. Poblete, L. L. Rodriguez, and F. O. Castro

Superovulation

225 Using a long-acting recombinant human follicle-stimulating hormone in cattle: 1. Superestimulatory response
G. Passamani, R. M. Moura, L. P. Martins, C. A. C. Fernandes, L. G. B. Siqueira, R. A. Figueiredo, and J. H. M. Viana

226 Using a long-acting recombinant human follicle-stimulating hormone in cattle: 2. Superovulatory response
R. M. Moura, L. P. Martins, G. Passamani, C. A. C. Fernandes, L. G. B. Siqueira, R. A. Figueiredo, and J. H. M. Viana

227 Ovarian stimulation in aged mice results in placental genomic imprinting dysregulation
C. Stobbe, M. D. Tignanelli, B. McCallie, and M. Katz-Jaffe

228 Effects of follicular superstimulation on ovum pickup–*in vitro*-produced outcome in German Fleckvieh heifers
D. Scarlet, I. Serbetci, M. Lautner, and H. Bollwein

229 Machine learning identifies differences in morphokinetics of *in vivo*-derived bovine embryos between hot and cool seasons

C. Hayden, C. Wells, A. Wiik, and R. Killingsworth

230 The use of recombinant human follicle-stimulating hormone in comparison to pituitary-derived follicle-stimulating hormone prior to ovum pickup *in vitro* embryo production in cattle

S. P. Patil, S. S. Layek, K. K. Karuppanasamy, S. Doultani, S. Raj, K. B. Raval, P. Sharma, and S. Gorani

231 Blood plasma-derived extracellular vesicle characterization as a predictor of superovulatory response in sheep

M. C. C. Morais, A. P. P. Schmidt, L. F. L. Correia, P. M. S. Rosa, J. da Silveira, F. Z. Brandão, A. S. Alcântara-Neto, and J. M. G. Souza-Fabjan

Undergraduate Poster Competition Finalists

232 The effect of supplementation with nicotinamide mononucleotide on *in vitro* maturation medium and the impact on bovine embryo development

A. C. Carrillo Gomez, V. Dominguez, V. Torres, M. Duque Rodriguez, and R. Urrego

233 The influence of different cryoprotectants on mitochondrial function in vitrified bovine oocytes

A. Dalton, E. Girka, A. Brewer, and K. Bondioli

234 Effect of sericin supplementation in synthetic oviductal fluid medium for *in vitro* maturation of canine oocytes

S. Sanchez Gomez, J. Velasquez Vasquez, F. Correa Monsalve, A. C. Carrillo Gomez, V. Dominguez, V. Torres, O. H. Velasquez Arboleda, R. Urrego, and M. Duque Rodriguez

Author Index

Author, Poster = abstract number in *Reproduction, Fertility and Development* 2024; 36 (1-2)

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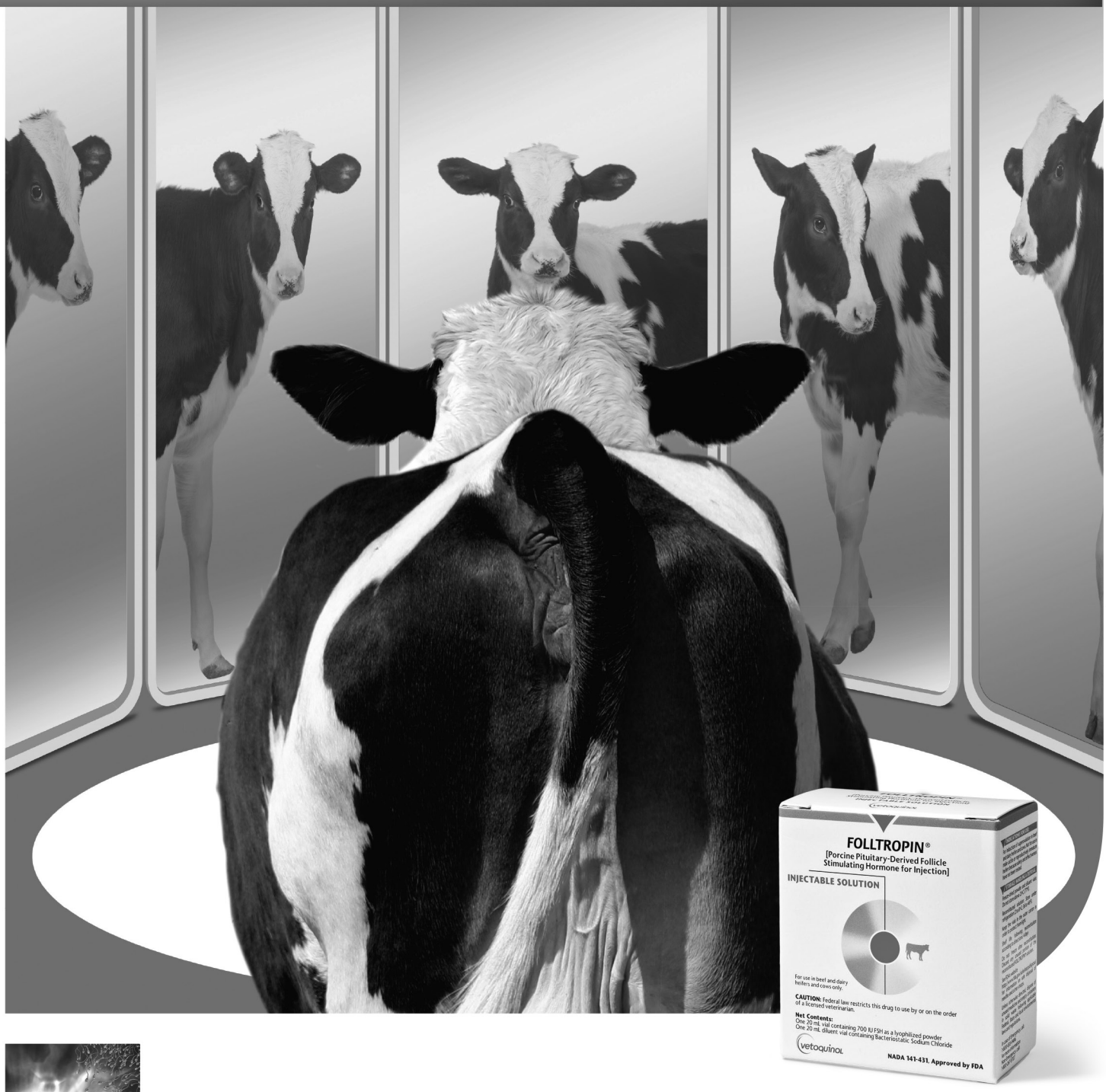

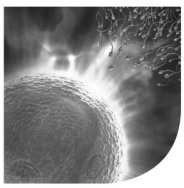

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ACHIEVE MORE TOGETHER

Recipient of the 2024 IETS Distinguished Service Award

George Perry

Dr. George Perry obtained his BVSc degree from the University of Queensland in 1976. After a year as research veterinarian at Coolum Research Station with the Queensland Department of Primary Industries, Perry, newly married, moved to Walgett in 1978 to start up a mixed practice to service outback north-west New South Wales, an area of over 130,000 km^2, which is roughly the size of England. This included getting a private pilot licence to fly to properties and towns in the region. Twelve years later, because of the loss of his wife to cancer and being a sole parent to his three young children, Perry sold his practice with its long hours to become a district veterinarian for the Walgett Rural Lands Protection Board with its more regular hours. While there, Perry graduated as a member of the Australian and New Zealand College of Veterinary Scientist in Veterinary Epidemiology.

In 1996, after marrying again, Perry moved to Sydney to do some contract work. The, in 1998, he moved to Canberra, where he became a veterinary officer specializing in import risk analyses, especially of germplasm, with the Animal Biosecurity Branch of the Australian Department of Agriculture and Fisheries until his retirement in 2019.

During his time there, Perry was involved as epidemiologist in managing and eradicating Newcastle disease outbreaks in poultry in New South Wales in 1998 and 1999, in the foot-and-mouth disease outbreak in the UK in 2001, and in the equine influenza outbreak in Australia in 2007.

It was in 2005 when Perry, representing the Australian government on the HASAC Regulatory Subcommittee, first attended the IETS conference in Copenhagen, Denmark, where he volunteered his expertise to write a paper on the quantitative risk analysis on BVDV in abattoir derived bovine IVP embryos for the HASAC Research subcommittee. The conclusions reported in this paper resulted in minor amendments to the EU rules on trade in IVP embryos. This began an association with HASAC that has continued to the present day.

In 2012, the IETS Board of Governors approached Perry to chair the Data Retrieval Committee. Perry accepted and immediately organised the development of a web-based database for the collection and storage of ET data from countries using embryo technology in livestock to replace the very laborious process of collecting paper-based ET data for manual transfer to spreadsheets. Already, there are over ten years of ET data on the database, clearly demonstrating the negligible risk of pathogen/disease transmission via in vivo-derived (IVD) and in vitro-produced (IVP) embryos in cattle, sheep, goats, pigs, horses and deer.

In 2019, Perry was accepted to become chair of HASAC, with shared responsibilities for the publication of the 5th edition of the IETS Manual with Dr. Sue Leelawardana and the updating of the risk categorisation of diseases/pathogens in ET in IVD embryos with Professor Lamia Briand and extending this to IVP embryos. Since then, Perry has authored and co-authored updates to five chapters in the IETS Manual, and reviewed most other chapters prior to their publication. Because of changes to technology in the production of IVP embryos, the time and expertise required of people already overworked, the risk categorisation project is still to be completed.

Currently, Perry is involved in developing IETS collaboration with the International Committee for Animal Recording (ICAR) and further strengthening relationships with the World Organisation for Animal Health. These steps serve to enhance the international reputation of the IETS.

The Board of Governors consider George Perry to be a most worthy recipient of the 2024 IETS Distinguished Service Award.

Special Events

Preconference Symposium

Monday, January 8
08:00–12:00
Colorado State University Spur Campus, Denver

Effective communication of bovine embryo assisted reproductive technologies
Part 1: Communicating and demystifying bovine embryo assisted reproductive technologies

This activity is intended for academics, graduate and undergraduate students, administrators, applied academics, ET practitioners, ET/IVF clients, and the general public. The format will include case studies, breakout groups, and practical applications. The purpose is to explore producers' experiences with assisted reproduction in cattle. Identify common successes and frustrations. Develop tools to improve communication and clarity between producers, veterinarians, and assisted reproduction professionals and vendors. Develop or strengthen positive working relationships.

Part 2: Demystifying bovine embryo assisted reproductive technologies

National Western Stock Show
13:00 – 18:30

All activities will be interactive with audience participation.

This activity will be a live-streamed, covering OPU, embryo collection, embryo transfer, and decision-making. We will have equipment from different manufacturers and several practitioners that use the specific equipment. The workshop participants will have the opportunity to ask the practitioners questions regarding equipment use and setup at the workshop at the National Western Stock Show. The equipment vendors will have the equipment available. We will have superovulated cattle for this portion of the workshop. The emphasis for this activity will be all things on the cow side, with respect to the practitioner and an assistant performing anything related to OPU, embryo collection, embryo transfer, and decision-making in a real-time setting. We will also cover oocyte and embryo searching in the lab and embryo freezing. **Additional registration fee required.**

Preconference Symposium

Best practices in IVP – Tips, tricks, and lab management in cattle and human IVF clinics
Tuesday, January 9
08:00 – 17:00
Centennial Ballroom A, B, C

Part 1: Comparison of laboratory techniques in cattle and human IVF clinics

Participants will alternate between two stations where the differences in procedures for bovine and human IVF clinics will be demonstrated. Practitioners will guide participants through a hands-on exercise.

- Station 1: Embryo/Ooctye Handling
- Station 2: Embryo Culture and Development

Session B: Rotating demonstrations and hands-on exercises

- Station 1: Vitrification and Warming
- Station 2: Technology in the IVF Lab

Part 2: Skills Test Relay
Show off skills learned in a fun, interactive, repro themed relay race

Part 3: Laboratory Logistics & Careers
How to run an IVF lab; Tips, tricks, & best practices for laboratories

Discussion on different strategies for running practices and IVF laboratories. Scheduling patients/farms, hiring, etc.

Career development in human and cattle embryology/art

An open discussion about career paths and 'day to day life' of varied professionals in both animal and human reproduction labs. **Additional registration fee required.**

CANDES Preconference

Tuesday, January 8
08:30 – 17:00
Mineral Hall B, C

A quarter century of CANDES: State-of-the-ART in companion animals, non-domestic and endangered species

Assisted reproductive technologies (ARTs) are well established in various food and laboratory animal species. For a variety of reasons, including lack of funding and access to animals, comparable progress and success have not been achieved with companion animals, non-domestic and endangered species. The achievements during 25 years of CANDES in species such as rhinoceros, wild dogs, jaguar, fish, belugas, or general wildlife biobanking are summarized in the 2024 CANDES Preconference Symposium by leading researchers in their field, setting at the same time new goals for future research in accordance to the changing needs of CANDES species. **Additional registration fee required.**

If you are a Morula planning to attend the 50th Annual Conference, check out all the different activities that the Morulas BOG has organized for you. Some of these events require a ticket and registration.

Morulas and Mentors Luncheon

Wednesday, January 10
12:30 – 14:00
Mineral Hall B, C
Sponsored by CSIRO Publishing

One of the main goals of the Morulas association is to provide trainees the opportunity to interact with the senior members of the IETS. **The Morulas and Mentors Luncheon** is designed to give trainees an opportunity to sit down with mentors in small groups, giving them a chance to interact and develop a connection with leaders in our field. Four amazing mentors will join the lunch and share their wisdom with the Morulas. **(Ticket required)**

Dr. Ann Van Soom obtained her DVM from Ghent University, Belgium, and earned her PhD in bovine embryo development in 1996. She has been with Ghent University since 1990, currently serving as a full professor and head of the Department of Reproduction, Obstetrics, and Herd Health. As a diplomat of the European College of Animal Reproduction (ECAR) since 1999, she's been actively involved in organizations like EVSSAR and IETS, where she served as a governor in 2007 and 2013. She chaired the COST Action Epiconcept FA1201 from 2012 to 2016, participated in EU-ITN network RepBiotech, and is currently involved in EU-ITN network EUROVA. Van Soom is an expert in assisted reproduction, with over 20 years of teaching experience. Her research, published in more than 400 papers with an h-index of 52, focuses on embryonic development, semen quality, and the impact of *in vitro* culture conditions. She supervises a group researching epigenetic changes, embryo-maternal interaction, and factors affecting semen quality in various species. In her clinical role, she specializes in small animal reproduction, particularly semen collection, gamete cryopreservation, and artificial insemination in cats and dogs. Additionally, she provides expertise in small animal obstetrics and advises on new contraception methods and oestrus induction. As of November 2023, she has supervised 42 PhD students, served on numerous examination committees, and continues to contribute significantly to the field.

Dr. Trudee Fair is a professor of animal physiology and reproduction at University College Dublin, Ireland. Dr. Fair studied animal science in UCD, completing a master's degree under the supervision of Ian Gordon in the area of *in vitro* embryo production in cattle, and subsequently carried out her studies in bovine oocyte growth for her PhD thesis under the supervision of Torben Greve and Poul Hyttel, at the University of Copenhagen, Denmark. Trudee's research centers on molecular aspects of bovine oocyte growth, maturation, and maternal immune system involvement in cattle fertility. With an h-factor of 52, she has extensive publications and is funded by National and European agencies. Trudee supervises graduate students and postdocs, and coordinates the EU-MSCA Innovative Training Network EUROVA, a multi-species, multi-discipline doctoral program in oocyte biology (www.eurovaetn.eu).

Dr. Carl Jiang was last year's IETS Early Career Achievement Awardee. Jiang is an associate professor in the Department of Animal Sciences at the University of Florida and a member of UF Genetics Institute. He received his PhD from University of Connecticut in 2015, was a postdoctoral associate at Yale School of Medicine, and then from

2017 to 2022, he worked as assistant professor, associate professor and Doyle Chambers Distinguished Professor at the Louisiana State University. Jiang conducts research in the areas of reproductive biology with emphasis on understanding epigenetic mechanisms during pre- and peri-implantation embryo development when most pregnancy losses occur. His group has also contributed to the derivation of bovine stem cell models and development of bovine stem cell-derived embryos (bovine blastoids), and is currently working to use this technology to develop novel ARTs for cattle reproduction. Jiang was the recipient of the 2023 IETS Early Career Achievement Award for his contribution toward advancing embryo technologies.

Dr. Niamh Forde is a professor and chair of molecular reproductive biosciences based in the School of Medicine at the University of Leeds where she established her group in 2015. She also co-founded and is co-director and current academic lead for LeedsOmics, a virtual research institute. Her group is focused on understanding the molecular interactions between the uterine endometrium and the embryo that are required for successful early pregnancy in mammalian species with different implantation strategies (cattle, pigs, humans). She is also interested in how the maternal environment, sex of the embryo, and extracellular vesicles influence these interactions. To achieve this her group uses a combination of *in vivo* and *in vitro* (including micro-fluidics, organoids, and extracellular scaffolds) approaches, as well as omics technologies to understand fundamentally how both protein-coding and non-coding parts of the genome regulate endometrial function for food, fertility, and health. **Additional registration fee required.**

Welcome Reception

Wednesday, January 10
17:30–19:30
Centennial Ballroom D–H
Sponsored by Genus plc

Join us Wednesday, January 10, to celebrate the 50th anniversary of IETS. We have over 20 exhibitors, 234 posters, and old and new friends with whom to meet and network. Join us for our first "Brewfest" event. We have invited some local breweries to come and share their best recipes. Greeley Hat Works will also join us to create a Western feel for the event, and you might decide you need a new hat, cowboy style. The Dugan Irby Band will be there to play some songs and get you in the mood for a once-in-a-lifetime celebration of IETS. Don't miss this event.

Morulas Student Mixer

Wednesday, January 10
19:30 – 20:30
Quartz A, B

Shortly after the IETS Welcome Reception, all trainees are 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 establishing connections that last a lifetime. It is our pleasure to invite you all to the upcoming annual social event, the Morulas Mixer. We will all be gathering at 19:30 on Wednesday, January 10. We are excited to have an exclusive time set aside for trainee interaction. Some drinks and snacks will be provided. **(Registration and tickets are NOT required.)**

IETS Morulas Forum

Thursday, January 11
11:30 – 12:30
Mineral Ballroom B, C

All Morulas and young researchers are invited to attend the Morulas Forum. The Morulas Board of Governors will welcome new members and explain our activities, encouraging active participation in the IETS. A summary of Morulas activities during 2023 will be presented, together with plans and perspectives for the future. All members have the opportunity to participate and express opinions or ideas. In addition, we will say goodbye to Morulas President Krishna Chaitanya Pavani, who served on the Morulas Board of Governors for two years to grow and strengthen the trainee association. We will then officially welcome the newly elected president to their two-year terms. This is a great time to get involved and discuss important events and opportunities for all Morulas.

Open Meeting of the Health and Safety Advisory Committee (HASAC)
Thursday, January 11
11:30 – 12:30
Centennial Ballroom A–C

Morulas Career Luncheon
Thursday, January 11
12:30 – 14:00
Mineral Hall A
Sponsored by CSIRO Publishing

Trainees will have the opportunity to meet and interact with three fantastic senior IETS members who will talk about their experiences, career paths, and decisions that have led them to their current position, either within the industry or academia. We look forward to hearing the presentations.

Dr. Liesl Nel-Themaat has been in the field of assisted reproduction for more than 20 years, with the past 11 years in clinical IVF. She possesses a unique combination of a strong academic background, broad technical experience, and extensive leadership, and management training. Through a multi-dimensional approach, she has helped to improve patient care and outcomes in assisted reproductive technology (ART). Nel-Themaat currently is the IVF lab director and associate clinical professor at the Stanford University Fertility and Reproductive Health program and the embryology lab director for IVF Phoenix. She was formerly the regional lab director for Shady Grove Fertility in Colorado, as well as the former IVF lab director at University of Colorado Advanced Reproductive Medicine. She received her bachelor's of science degree from Stellenbosch University (South Africa), her PhD in reproductive physiology from Louisiana State University, (making her one of Bob Godke's "Repro Rangers") and an executive MBA from the University of Denver. Nel-Themaat has served and continues to serve on several national and international boards and committees. These include having served as president of the ASRM Society for Reproductive Biologists and Technologists (SRBT), founder and current chair of the SRBT global Outreach Committee, co-founder and first president of the Colorado Association of Reproductive Technologists (CART), a founding member of the International IVF Initiative (i3), former Board member of the College of Reproductive Biology (CRB) and is known for starting World Embryologist Day. Nel-Themaat is an active member of ASRM, SRBT, SMRU, AAB, ABB, and CRB and has a distinguished record of publications.

Dr. Paula Rodriguez-Villamil has been an active member of the IETS since 2010 and also part of the DABE committee. She holds a veterinary degree from Colombia National University and started her career in the commercial animal reproduction field as a bovine embryo transfer practitioner. Later, she pursued her master's degree in veterinary sciences from the Federal University of Rio Grande do Sul (Brazil) and a PhD in animal sciences from Cordoba National University (Argentina). Her extensive experience spans both the commercial and research aspects of bovine *in vivo* and *in vitro* embryo production. She worked in the two areas during her time at the Animal Reproduction Institute Cordoba in Argentina. She transitioned into academia, serving as a professor of reproductive physiology at a University in Colombia. She continued her academic journey by completing a postdoctoral fellowship at the Federal University of Ceara (Brazil), where she focused on proteomics in the context of reproduction. Her areas of expertise include in vitro and in vivo embryo production, cryopreservation, embryo transfer, and cloning in several species, including bovine, porcine, mice, and small ruminants. She also has a background in the industry, having worked for several years at Recombinetics Inc. as the director of the embryology lab, where she gained expertise in gene editing animal production until 2022. Currently, she leads the *in vitro* fertilization research and development team at Genus plc.

Dr. Anna Denicol earned a DVM degree at the Federal University of Rio Grande do Sul, Brazil, a master's in preventive veterinary medicine at University of California Davis, and a PhD in developmental biology at University of Florida. After a two-year postdoc at Northeastern University, Anna returned to UC Davis in 2016, where she is now associate professor in the Department of Animal Science. The Denicol Lab focuses on oogenesis and development of ovarian follicles starting from PGC specification in the early embryo to activation and growth of preantral follicles in the adult ovary. Within this area, there is particular interest in the roles of FSH to regulate early folliculogenesis. A more recent focus of the Denicol Lab has been the study of embryonic stem cells and their differentiation potential into the female germline to enable assisted reproductive technologies utilizing *in vitro* oogenesis.

IETS Business Meeting
Thursday, January 11
14:30 – 15:00
Centennial Ballroom A–C

Don't miss this opportunity to hear about updates on the strategic plan and future programs of the IETS.

Practitioners' Forum
Thursday, January 11
15:00 – 17:00
Centennial Ballroom A–C
Sponsored by Calier

Integration of Reproductive Ultrasound in Embryo Recipient Evaluation

Topics

1. Pre-screening recipients before synchronization (Hour 1)
   Cyclicity of heifers (CL, RTS, cervix); Cyclicity of early PP cows (CL, UT involution, post-calving trauma/uterine infection); Cyclicity of nutritionally restricted cows/heifers (CL, follicular activity, CL, uterus).
2. Assessment of CL viability at time of transfer (Hour 2)
   No ultrasound use (rectal palpation of ovaries and uterus); traditional real-time US (CL, CL types – homogenous vs. fluid cavity vs. luteal cyst, uterine appearance); Use of color doppler US (vascularity of CL, uterus, etc.); Correlates to utilization rates, non-return rates, pregnancy rates.

Several professional experts will present short descriptions of each topic followed by an interactive panel discussion between the experts and the audience. Numerous scenarios will be covered during the presentations and discussion.

DABE Forum
Thursday, January 11
15:00 – 17:00
Mineral B, C

In this concurrent session hosted by DABE at the IETS Annual Meeting in Denver, 2024, we'll delve into the fascinating world of animal cloning. Dr. Angelika Schnieke, the chair of Livestock Biotechnology at the Technical University of Munich's School of Life Sciences, will lead the discussion with her talk, titled "Unveiling the Journey of Animal Cloning: Exploring Past Technologies and Charting Future Directions." This session aims to offer a clear understanding of animal cloning's progression, highlighting past techniques while also looking ahead at its promising future. Join us to learn from a leading voice in livestock biotechnology.

IETS Awards Presentations and Updates
Friday, January 12
15:00 – 16:30

Join us for the Early Career Achievement Award winner presentation and the IETS Foundation Student Competition and Poster Award winners.

IETS Closing Party
Friday, January 12
20:00 – 02:00
Denver Museum of Nature and Science

Get out your gold for a night of celebration at the Denver Museum of Nature and Science!

We will be closing our 50th Annual Meeting in style and invite you to dress to the nines by wearing something gold to celebrate this milestone year. You will want to look your best for the red-carpet entrance! Your ticket will give you access to the museum and all it has to offer. Once you've explored, sit down for a Colorado-themed buffet and then dance the night away to the tunes of DJ Two Scoops. You won't want to miss this fun evening with friends! (Don't forget your drink tickets.) **Additional registration fee required.**

IETS Foundation 2024 Early Career Achievement Award (Scientist)

Ky Pohler

Dr. Ky Pohler is an associate professor and chair of the Pregnancy and Developmental Programming Area of Excellence in the Department of Animal Science at Texas A&M University. He grew up in Shiner, Texas, and received a BS in animal science from Texas A&M University. He then received an MS and PhD from the University of Missouri. Prior to returning to Texas A&M, Dr. Pohler was on the faculty at the University of Tennessee in the Department of Animal Science. Dr. Pohler's research interest focuses on understanding the physiological and molecular mechanisms that control reproductive efficiency in cattle. More specifically, his lab is interested in the mechanisms that lead to embryonic and fetal mortality in cattle and development of management strategies to overcome these losses. Dr. Pohler's research program has led to 103 refereed journal articles, 5 book chapters, 37 conference proceedings, 100+ abstracts, and 15 popular press/extension publications. Dr. Pohler has also secured more than $8 million in grant and gift support for his program. In addition, Dr. Pohler is active in teaching and mentoring of students, as well as outreach, which includes leadership positions as the co-coordinator of the 44 Farms Texas A&M International Beef Academy and the Beef Reproductive Task Force.

Previous Recipients

Zongliang (Carl) Jiang (Scientist), 2023

Siddhartha Shankar Layek (Practicing Professional), 2023

Islam M. Saadeldin (Scientist), 2022

Joanna Maria Gonçalves de Souza-Fabjan (Scientist), 2020

Alejo Menchaca (Scientist), 2019

Kiho Lee (Scientist), 2018

Pablo J. Ross (Scientist), 2017

Todd Stroud (Practitioner), 2017

IETS Foundation 2024 Early Career Achievement Award (Practicing Professional)

Brittany Scott

Brittany Scott is a proud graduate of Louisiana State University with an MS in reproductive physiology. She immediately co-founded a reproductive physiology company focused on small ruminants. Initially, the company serviced the domestic market, traveling the United States and assisting breeders in furthering their genetic programs. As time passed and her family grew, a dilemma presented itself, namely the desire to have a full-fledged career and be a present, loving parent. Finally, inspiration struck during a struggle with pregnancy-related insomnia; she would provide a unique product to bring customers to northeast Arkansas.

Due to the high quality and data-backed evaluation programs, United States-bred sheep and goat genetics are some of the most productive in the world. This commitment to excellence and furthering industry-wide genetic development from the individual breeders means that the United States is one of three international markets that are in a position to supply these buyer demands. Seizing this opportunity, Scott began working directly with the USDA to create the multi-country framework that would enable the export of these products. In 2021, she exited the company and founded SMART Reproduction to focus on promoting and supplying these genetics internationally.

In 2017, she founded Delta Livestock Diagnostics, a serology testing lab specializing in small and large ruminant disease and early pregnancy detection testing. Additionally, Delta is the only NVSL EIA-approved lab located in northeast Arkansas. While not having the reach of its international sister company, this company provides important domestic smallholder access to biosecurity testing of economically impactful diseases.

With over a decade of experience in small ruminant physiology, Scott is a passionate and knowledgeable advocate for small ruminants in both the domestic and international spheres and the groundbreaking social and economic empowerment impact they can have.

Session Speakers and Keynote Biographies

John F. Hasler

Dr. John F. Hasler earned BA (1966) and MA (1969) degrees in zoology from the University of Missouri-Columbia. After being drafted in 1968, he spent two years of service in the US Army, including one year in Vietnam. He received a PhD in reproductive physiology from the University of Illinois in 1974. He then joined the Embryo Transfer Laboratory at Colorado State University as a post-doc in the autumn of 1974. In 1978, he and a partner started Em Tran, Inc. in Elizabethtown, Pennsylvania, and they spent the next 23 years engaged in commercial embryo transfer. Em Tran was among the first organizations to establish a market for frozen embryos in a number of foreign countries and was a leader in introducing splitting, in vitro fertilization, and embryo sexing technologies to the embryo transfer industry. Dr. Hasler was a founding member of the American Embryo Transfer Association and served as the first secretary/treasurer of the organization and served two terms as secretary/treasurer of the International Embryo Transfer Society. He received the Army Commendation Medal in 1970, the Schering-Plough Animal Health Embryo Transfer Person of the Year in 1992, the International Embryo Technology Society Distinguished Service Award in 2014, and the American Embryo Transfer Association Lifetime Achievement Award in 2014. Dr. Hasler has maintained active research collaborations with scientists at several universities and has published numerous papers involving embryo transfer and related technologies, and he has given lectures in more than 20 foreign countries. Having sold his interest in Em Tran, Inc. in 2001, Dr. Hasler now lives near Fort Collins, Colorado, and currently serves as a technical consultant to Vetoquinol USA Inc., Fort Worth, Texas.

Michel Thibier

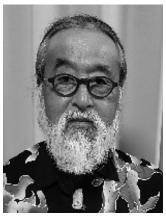
Michel Thibier is Docteur Vétérinaire (DVM), Docteur ès Sciences (University of Paris, Pierre et Marie Curie). He is honorary professor at AgroParisTech (Univrsity of Paris-Saclay, France) and a French citizen. His career was that of a scientist in animal reproduction and later a high-level administrator in public research.

Among several positions, from 1984 to 1994, Professor Michel Thibier has been director of the French Research and Development Laboratory on Animal Reproduction, Animal Health and Biotechnology at Maisons Alfort (France). He has also been later director general of education and research at the Ministry of Agriculture and Fisheries (2002–2006).

He has published two textbooks on animal production (cattle and sheep) and more than 350 scientific papers, mainly in international peer-reviewed journals.

Now retired from the French public service, Professor Thibier is currently acting as a private consultant in animal reproduction biotechnology.

Takashi Nagai



In 1984, Dr. Takashi Nagai succeeded in getting *in vitro*-fertilized oocytes in pigs by using only defined media for the first time in the world; he found that preincubation of epididymal spermatozoa at high concentrations is effective for sperm capacitation resulting in successful in vitro fertilization, and he got the PhD from Kyoto University under the direction of Dr. Akira Iritani. In the same year, he got a job as a researcher under the instruction of Dr. T. Sugie, at the National Institute of Livestock and Grassland Science. He has published more than 250 papers in international journals, and presented papers at many international congresses; he has been invited as a keynote speaker at many congresses and has become one of the leaders in the field of animal biotechnologies, such as *in vitro* fertilization, embryo transfer, and production of cloned and transgenic animals in the world. He was selected as a member of the IETS Board of Governors during 2002 to 2005, and then became its vice president in 2005 and its president in 2006 to 2007. In 2023, he retired from any jobs.

Zongliang (Carl) Jiang

Dr. Carl Jiang is an associate professor in the Department of Animal Sciences at the University of Florida and a member of the UF Genetics Institute. He received his PhD from the University of Connecticut in 2015, was a postdoctoral associate at Yale School of Medicine, and then from 2017 to 2022, he worked as assistant professor, associate professor, and Doyle Chambers Distinguished Professor at the Louisiana State University. Dr. Jiang conducts research in the areas of reproductive biology with emphasis on understanding epigenetic mechanisms during pre- and peri-implantation embryo development when most pregnancy losses occur. His group has also contributed to the derivation of bovine stem cell models and development of bovine stem cell-derived embryos (bovine blastoids), and is currently working to use this technology to develop novel ARTs for cattle reproduction. Dr. Jiang was the recipient of the 2023 IETS Early Career Achievement Award for his contribution toward advancing embryo technologies.

Sofia Ortega

Dr. Sofia Ortega is originally from Honduras, where she completed a bachelor of agricultural sciences at Zamorano Agriculture University, and later a master of sciences in animal sciences from the Pontifical Catholic University of Chile in 2011. She then did a PhD in animal molecular and cellular biology under the supervision of Peter Hansen at the University of Florida, focusing on the genetic control of reproduction and embryonic development in dairy cattle. In 2017, she moved to the University of Missouri, where she was a postdoctoral fellow under the mentorship of Tom Spencer studying mechanisms involved in pregnancy establishment in cattle using systems biology and genetic engineering approaches. She continued at the University of Missouri from 2019 to 2022 as an assistant professor of reproductive physiology, studying the genetic regulation of fertility with an emphasis on male influences on preimplantation embryonic development and placentation in the bovine. In August 2022, Sofia moved to the Department of Animal and Dairy Sciences at the University of Wisconsin–Madison as an assistant professor of reproductive physiology and continues with her line of research.

Sofia's group works on elucidating paternal and maternal influences on bovine embryonic development and pregnancy. The long-term goal of her program is to identify key variants and mechanisms associated with pregnancy establishment and use that information to improve reproduction and genetic selection for fertility in cattle.

Ricardo C Chebel

Ricardo C. Chebel graduated from veterinarian school (Universidade Paulista) in 1999, and completed a master's degree and residency in dairy production in 2004 at the University of California, Davis, and a PhD at Universidade de São Paulo in 2018. He has had a research/clinical/extension appointment at University of Idaho, University of California, Davis, University of Minnesota, and University of Florida.

Ricardo's research focus is dairy cattle health, management, and welfare, with an emphasis on periparturient cow health and behavior, automated devices for monitoring periparturient cows and pre-weaned calves, reproductive physiology and management, automated devices for estrous detection, and improvement of fertility.

Deirdre Zander-Fox

Professor Deirdre Zander-Fox has worked in assisted reproduction since 2004. She is currently the Monash IVF Group chief scientific officer, as well as being regional scientific director overseeing Monash IVF Victoria, Monash IVF Albury and Malaysia. She is currently responsible for the scientific directorship, operations, and provision of clinical embryology, andrology, endocrinology, and genetic testing services within these clinics. She is also chair of the Group Scientific Advisory Committee for the Monash IVF Group. In addition to her clinical roles, Professor Zander-Fox also holds multiple academic positions including adjunct professor at Monash University and associate professor at the

University of Adelaide, as well as holding National Health and Medical Research Council (NHMRC) research funding, including being a CI on a recent $15 million MRFF mitochondrial donation grant. Professor Zander-Fox has authored a substantial number of peer-reviewed journal articles and book chapters with her research primarily focusing on improving laboratory technology that will directly benefit infertile patients including cryopreservation, microinjection technology, and culture media design.

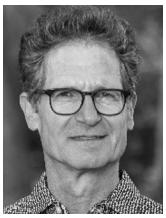
Niamh Forde

Professor Forde is professor and chair of molecular reproductive biosciences based in the School of Medicine at the University of Leeds, where she established her group in 2015. She also co-founded and is co-director and current academic lead for LeedsOmics a virtual research institute. Her group is focused on understanding the molecular interactions between the uterine endometrium and the embryo that are required for successful early pregnancy in mammalian species with different implantation strategies (cattle, pigs, humans). The group is also interested in and how the maternal environment, sex of the embryo, and extracellular vesicles influences these interactions. To achieve this her group uses a combination of *in vivo* and *in vitro* (including micro-fluidics, organoids, and extracellular scaffolds) approaches, as well as omics technologies to understand fundamentally how both protein coding and non-coding parts of the genome regulate endometrial function for food, fertility, and health.

Gregory A. Johnson

Dr. Gregory A. Johnson is a professor in the Department of Veterinary Integrative Biosciences at Texas A&M University (TAMU) where he is a member of the Interdisciplinary Faculty of Reproductive Biology. He received a BS degree in zoology, an MS degree in microbiology, and a PhD degree in animal science (reproductive biology) from the University of Wyoming. Following graduation, Greg was a post-doctoral fellow with Dr. Fuller W. Bazer within the Department of Animal Science at TAMU, and then a member of the faculty of the Department of Animal and Veterinary Science at the University of Idaho from before moving to TAMU. His primary research interest is in pregnancy, with an emphasis on the interactions between the uterus and conceptus (embryo/fetus and associated placental membranes) that mediate the establishment and maintenance of pregnancy, including pregnancy recognition, conceptus implantation, and placental development.

Göetz Laible



Göetz Laible is principle scientist at AgResearch and honorary associate professor at the University of Auckland. He holds a PhD in biochemistry from the Free University of Berlin, Germany, and completed his scientific training at the Salk Institute for Biological Studies in San Diego, California, and the Research Institute of Molecular Pathology in Vienna, Austria. In 1997, he joined AgResearch where he leads a research program focused on the development and evaluation of technologies for the directed genetic improvement of livestock aimed at agricultural and biomedical applications.

Eldar Zehorai

Dr. Eldar Zehorai is a team leader and project manager at Aleph Farms, a leader in cellular agriculture. In his role, Eldar heads the sourcing and derivation of embryonic stem cells. Based in Israel, Aleph Farms is dedicated to diversifying the supply and decentralizing the production of high-quality animal proteins and fats. Under its first product brand, Aleph Cuts, the company is poised to launch the world's first cultivated beef steaks. Before assuming his current role, Eldar completed his postdoctoral research at the Weizmann Institute of Science, where he investigated the impact of exogenously remodeled endometrial ECM on embryo implantation rates. Eldar holds a PhD in biology from the Weizmann Institute of Science, specializing in the study of novel nuclear translocation mechanisms of signaling molecules.

Trudee Fair

Trudee Fair is professor of animal physiology and reproduction in the School of Agriculture and Food Sciences, University College Dublin (UCD), Ireland. Trudee studied Animal Science at UCD, completing a master's degree under the supervision of Professor Ian Gordon in the area of *in vitro* embryo production in cattle and subsequently carried out her studies in bovine oocyte growth for her PhD thesis under the supervision of Professor Torben Greve and Professor Poul Hyttel, at the University of Copenhagen, Denmark. Since then Trudee has continued to work in the area of cow fertility. Her research focuses on molecular aspects of bovine oocyte growth, maturation and acquisition of competence and the role of the maternal immune system in oocyte maturation, ovulation and the establishment of pregnancy in cattle.

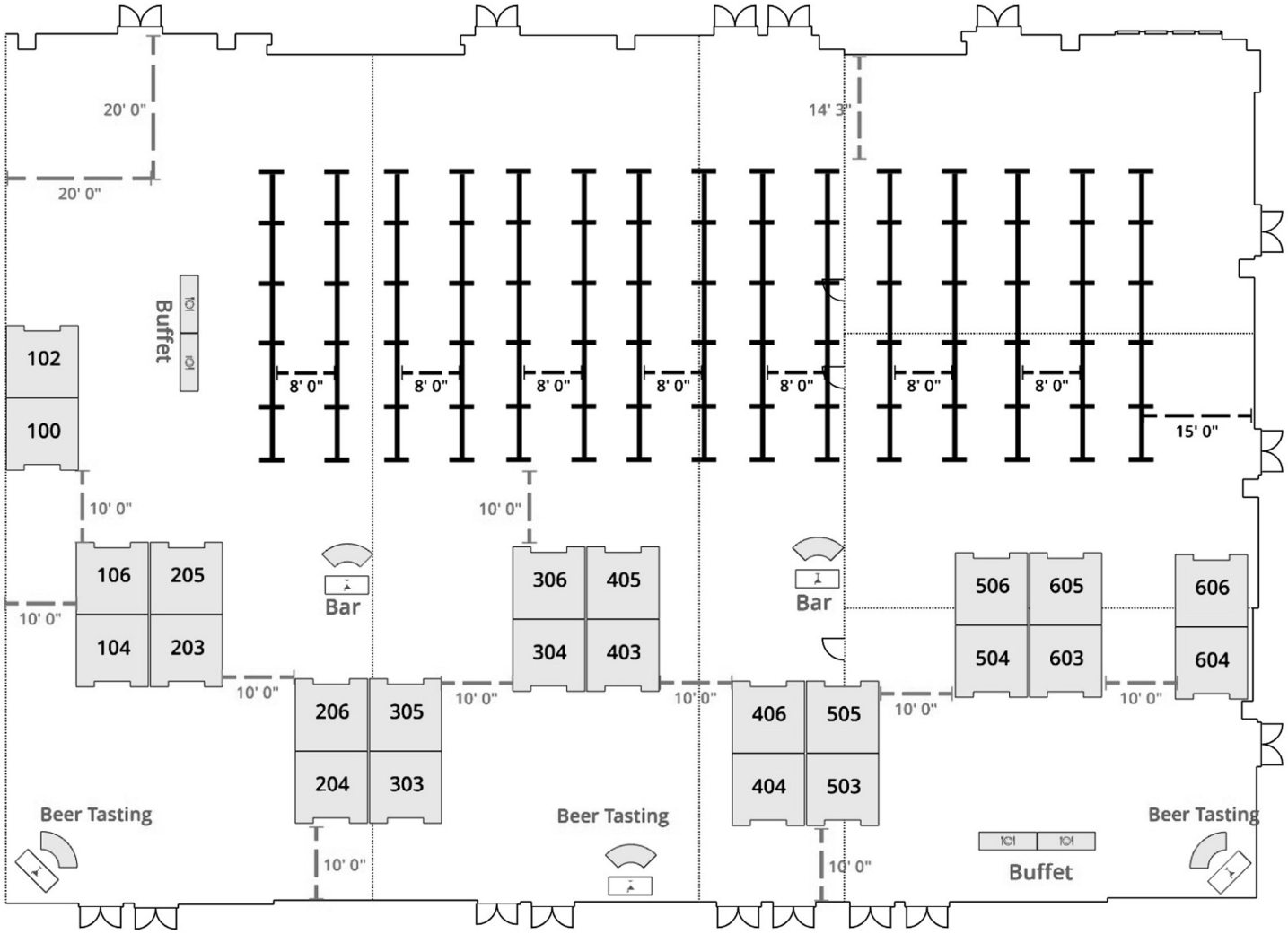
Trudee has published extensively; her h-factor is 52 (Google Scholar); her research is funded by National (HRB/IRC/SFI) and European funding agencies. She has supervised numerous master's and PhD students and postdoctoral fellows and is currently the coordinator of an EU-MSCA Innovative Training Network in oocyte biology (EUROVA), comprising research and industry partners based in Europe, the UK, Brazil, and the United States. EUROVA is training 15 early-stage researchers in oocyte biology using a multi-species, multi-discipline doctoral program approach (www.eurovaetn.eu).

Exhibit Directory

Booth Listing by Number:

Booth Number	Company
100	DRAMINSKI S.A.
102	Vetoquinol
104	MAI Animal Health/ICPbio Reproduction
106	Genea Biomedx
203	Professional Embryo Transfer Supply Inc. (PETS)
204	Simplot Animal Sciences
205	Stroebech Media
206	ABT 360 LLC
303	NextGen LifeLabs
304	Partnar Animal Health Inc.
305	IMV Technologies/IMV Imaging
306	E.I. Medical Imaging
403	VetMotl Inc.
404	ART Lab Solutions Pty Ltd.
405	Calier
406	Esco Technologies Inc.
503, 505	WTA Technologies LLC
504	IVF Bioscience
506	IVFtech ApS/Hamilton Thorne
603	Agtech Inc.
604, 606	Minitube USA Inc.
605	American Embryo Transfer Association (AETA)

Exhibit Hall Layout



Exhibitor Directory

ABT 360 LLC

ABT 360 LLC is a US-based veterinary embryo transfer media manufacturer, established in 2017. Much like its predecessor, AB Technology, which established itself in Pullman, Washington, in 1990, ABT 360 will strive to provide you with quality and consistency in their product and back those same products with exceptional customer service. All our products are manufactured in a clean-room environment and go through strict quality control practices, ensuring consistency and quality from lot to lot. We offer a complete line of media for all your bovine and equine ET needs.

- 100% traceable components
- Serial filtered; no additional filtering required
- Tight quality control standards equal consistent results
- Made in the USA

1615 NE Eastgate Blvd, Section H
Pullman, WA 99163 USA
Phone: (509) 592-8144
www.abt360llc.com
Booth: 206

Agtech Inc.

Our focus is livestock embryo and semen technologies! Since 1990 we have been formulating and designing field-tested liquid media and devices for livestock assisted reproductive technologies (ART), specifically ovum pickup, *in vitro* fertilization, and multiple-ovulation embryo transfer technologies. Many products are designed by and manufactured *exclusively for* Agtech.

Agtech inventories more than 300 ART items for procedures including oocyte collection/maturation/fertilization, embryo collection and transfer, and semen collection/freezing.

Complementing Agtech-branded devices and media are proven products by IVF Bioscience, WTA, Cryologic, SOZOOD, ABT-360 and Botupharma. Examples include semen collection-evaluation-packaging and insemination equipment, veterinary pharmaceuticals, media for *in vitro* fertilization-incubation-transfer, multi-well culture dishes, lab surface disinfectants, controlled-rate portable biological freezers, and travel incubators.

We appreciate the challenges you face with your reproduction program and work hard to design/manufacture or source effective, high-value solutions that positively influence your reproduction outcomes.

Customers outside the US find it convenient to order ART products through Agtech's e-commerce store https://store.agtechinc.com which enables you to select products, 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 within, or outside the United States.

Agtech's education center offers hands-on workshops in bovine OPU, IVF lab, MOET, and AI.

Because *success transfers*, we take pride in customer relationships and providing you with the products, detail, value, and live-animal training opportunities which you expect. Our team looks forward to collaborating with you!

Agtech Inc.
8801 Anderson Ave.
Manhattan, KS 66503 USA
sales@agtechninc.com
www.agtechinc.com
Booth: 603

American Embryo Transfer Association, AETA

The purpose of the American Embryo Transfer Association is to unite those organizations and individuals in the United States engaged in the embryo transfer industry into an affiliated federation operating under self-imposed standards of performance and conduct. The AETA embraces its responsibility as the resource for embryo transfer in the United States. This authority is developed and supported through our commitment to excellence in several broad areas: education and commitment to high industry standards.

American Embryo Transfer Association
1800 South Oak St. Suite 100
Champaign, IL 61820-6974
Phone: (217) 398-2217
Fax: (217) 398-4119
www.aeta.org/
Booth: 605

ART Lab Solutions Pty Ltd

Through innovation and quality of service, we deliver reproductive technologies that make a positive impact to valuable animal breeding. We source our innovations through our own research and those we collaborate within both academic and commercial environments, providing a means of translating research into industry sought-after innovation. We offer a complete serum-free *in vitro* embryo production media suite which is a result of over 35 years research by Professor Jeremy Thompson, the

company's founder. As leaders in IVF technology for cattle breeding, we're fostering rapid genetic improvement through the use of the best bull and the best cow genetics, improving the efficiency of cattle breeding programs worldwide.

ThincLab, 10 Pulteney Street
Adelaide, South Australia 5005
Australia
admin@artlabsolutions.com
www.artlabsolutions.com
Booth: 404

Calier

Calier is a leading animal health company in the field of ruminant reproduction. Under our slogan "Reproducing value," we work to make valuable products and services available to professionals. In addition, we carry out continuous training to keep them up to date with the latest trends in the sector. With subsidiaries in 12 countries, at Calier we develop, manufacture, and commercialize products that guarantee food safety and help prevent and control diseases, always working toward the "one health" concept. With our operations, we seek to contribute to the Sustainable Development Goals of the 2030 Agenda.

C/ Barcelones 26
Las Franqueses del Valles
Barcelona 08520
Spain
www.calier.com/en
Booth: 405

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 high quality of the products we offer and strong after-sales service. Innovation is in our blood adding innovative products to the company's portfolio all the time.

Ongoing co-operation 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.

Szabruk, W. Steffena 21
11-036 Gietrzwald
Poland
Phone: +48 89 675 26 00
www.draminski.com
Booth:100

E.I. Medical Imaging

For over 35 years, EIMI has been producing reliable, portable, veterinary ultrasound technology here in the US. The Ibex and EVO platforms are the latest evolution of rugged, lightweight units. We deliver great image quality and processing power in weather-resistant, versatile units that are appropriate for all practice types.

815 14th St. SW, Unit C210
Loveland, CO 80537 USA
Phone: 1-866-365-6596
www.eimedical.com
Booth: 306

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 Drive, Suite F
Horsham, PA 19044
https://www.esco-medical.com/
Booth:406

Genea Biomedx

Genea Biomedx leads globally in crafting cutting-edge medical devices for streamlined and automated fertility treatments. Our technology, dedicated team, and commitment to innovation reduce the impact of variables like human error. Our devices boast exceptional performance, reliability, and intuitive interfaces, ensuring optimal clinical outcomes. Investing heavily in R&D, we aim to revolutionize the IVF industry. Beyond superior products, Genea Biomedx is a trusted partner, providing unmatched customer service, training, and technical support to laboratories worldwide. Choose Genea Biomedx for transformative fertility solutions backed by expertise and innovation.

Level 3, 321 Kent Street
Sydney, NSW 2000
Australia
www.geneabiomedx.com

Booth: 106

IMV Technologies/IMV Imaging

IMV Technologies is the world leader in assisted reproduction biotechnologies. Founded in 1963, IMV Technologies has subsidiaries and/or manufacturing facilities in Belgium, Brazil, China, France, India, the Netherlands, Scotland, Spain, and the USA. IMV Technologies' family of companies operate leading brands in the areas of semen collection, semen analysis, assisted reproduction, artificial insemination, and veterinary imaging. Its Life Sciences division, Cryo Bio System, specializes in biobanking of high-value samples and human assisted reproduction technologies. For more information, visit www.imv-technologies.com and www.imv-imaging.com.

IMV Technologies
9501 Louisiana Avenue, Ste 300
Brooklyn Park, MN 55445 USA
contact@imv-technologies.com
www.imv-technologies.com
Booth: 305

IMV Imaging
2900 43rd Street NW, #600
Rochester, MN 55901 USA
www.imv-imaging.com/
Booth: 305

IVF Bioscience

IVF Bioscience manufactures high-quality, species-specific media for *in vitro* fertilization (IVF) in animals. Our innovative range of ready-to-use media is helping many customers around the world to consistently achieve higher blastocyst rates and superior results.

Our advanced, serum-free media system is provided in combination with an optimized IVF protocol and backed by continuous technical support, so you can be confident that you are in good hands.

IVF Bioscience has assembled a panel of globally renowned animal IVF experts, advising us on all aspects of OPU-IVP; from collection (OPU) right through to embryo transfer.

Collaborating with these world-leading scientists allows us to call on their expertise on subjects such as improvements to our existing media system, development of new products, as well as supporting customers in their use of our products.

Stop by our booth to find out more about our new product, BO-Freeze. This innovative product is specifically for the slow-freezing of bovine IVF embryos, with a novel component which contributes to the improved cryo-survival rates and post-thaw embryo quality.

Discover how IVF Bioscience can support your animal IVF laboratory on our website, where you can find out information about training courses and technical resources, and request a media trial.

Falmouth, Cornwall
United Kingdom
Phone: +44 1326 332461
www.ivfbioscience.com
Booth: 504

IVFtech ApS / Hamilton Thorne

IVFtech is a family-run Danish company based north of Copenhagen, Denmark. The company has been operating since 1998 and possesses market-leading industry experience and knowledge. In 2021 IVFtech was acquired by the American group Hamilton Thorne Ltd. and is now part of this global group. IVFtech is innovative and always on the lookout for new technology and ideas to help solve clients' challenges and specific needs and are a passionate manufacturer of bespoke workstations, incubators, and equipment for IVF laboratories. As such, they play an indirect but crucial role in helping people around the world become families. Visit our team with our sister company Hamilton Thorne Inc. at IETS!

Klintehøj Vænge 3-5
3460 Birkerød
Denmark
+(45) 39 40 25 65
info@ivftech.com
www.ivftech.dk
Booth : 506

Hamilton Thorne

Hamilton Thorne manufactures and markets laser systems, sperm analyzers, and a range of IVF equipment that enable breakthroughs in developmental biology research markets. With our sister companies of the Hamilton Thorne Group, we proudly offer incubators, workstations, air filtration, media, and consumables to improve the workflow of our worldwide customer base in animal research sectors. Visit our team with our sister company IVFtech at IETS and see how we can help you reach your research goals!

100 Cummings Center, Suite 465E
Beverly, MA 01915 USA
Phone: 1-800-323-0503
www.hamiltonthorne.com/
Booth: 506

MAI Animal Health/ICPbio Reproduction

MAI Animal Health™ is the source for solutions in animal healthcare. With extensive expertise across multiple veterinary disciplines and species, we manufacture and supply a vast array of innovative, practical products

in categories including containers, reproduction, dental, specialty, monitoring devices, nutritionals, and instruments. Veterinarian-owned and trusted globally; we have been servicing the animal healthcare industry for over 40 years.

605 Project Drive
Elmwood, WI 54740
sales@maianimalhealth.com
www.maianimalhealth.com
Booth: 104

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

303 S. McKay Avenue
Spring Valley, WI 54767
Info@icpbiorepro.com
www.icpbiorepro.com/
Booth: 104

Minitube USA Inc.

Founded in 1970 by Dr. Ludwig Simmet, Minitube International today sets worldwide standards in reproductive technology. Based on groundbreaking patents and ideas, the company has developed from a small provider of high-quality artificial insemination (AI) products to a world leader in state-of-the-art assisted reproduction technologies. With a full range of assisted reproduction products and services, Minitube provides a global service to customers in agriculture, sports, pet breeding, veterinary and human medicine and in diverse research fields.

As an industry leader, Minitube International understands the importance of providing products that do not compromise quality or safety, even if this results in higher production costs. For this reason, all proprietary products are manufactured in our own state-of-the-art, ISO-certified facilities. Headquartered in Tiefenbach, Germany, Minitube International serves customers worldwide with local support through highly qualified subsidiaries and distributors.

Minitube International is a second- and third-generation family business and is characterized by a positive, family-friendly corporate culture. A world-class team of scientists, researchers and technicians at Minitube is engaged in basic and applied research, product development, quality assurance, contract services and customer training. Minitube's experts work closely with leading breeding companies, universities and research institutes around the world to advance knowledge and technology.

419 Venture Ct
Verona, WI 53593
800-646-4882
www.minitube.com
Booth: 604,606

NextGen LifeLabs

Established in 2012, NextGen LifeLabs is your premier supplier of complete solutions for the modern IVF (ART) laboratory. Our team is dedicated to providing your IVF program with the most innovative laboratory equipment, consumables, and industry leading service and support. We offer an extensive catalog of services including skilled installation of a wide range of equipment, consumables, laboratory design, planning, and implementation, as well as laboratory expansion and relocation consultation.

NextGen LifeLabs
384 Nina Way
Warminster, PA 18974 USA
Email: info@nextgenlifelabs.com
www.nextgenlifelabs.com
Booth: 303

Partnar Animal Health

Partnar Animal Health is a manufacturer of commercial media for embryo transfer and provides contract manufacturing of media for IVF laboratories. As well, we manufacture a range of consumable devices for both ET and OPU.

One of the most notable products we distribute exclusively, on a global basis, is MicroQ devices for controlled temperature shipping and transport of oocytes and IVP embryos.

1915 Dove Street
Port Huron, MI 48060
www.partnaranimalhealth.com
Booth: 304

Professional Embryo Transfer Supply Inc. (PETS)

PETS has been a world-leading embryo transfer supply company in the bovine and equine industries for over three decades. Our goal all this time has been your success, and we work every day to achieve this with quality service and ET supplies from ICPbio, MAI, Vetoquinol, 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: 203

Simplot Animal Sciences

Simplot's Animal Sciences team provides solutions for researchers and beef and dairy cattle producers. Combining extensive experience in agribusiness with the latest in reproductive solutions, the Animal Sciences team developed the innovative SimVitro® branded IVF embryos for cattle producers. Additionally, they are a leader in providing oocytes and ovarian tissues to researchers focused on improving IVF and other advanced reproductive technologies.

2405 Brogan Rd
Emmett, ID 83655
www.simplot.com
Booth: 204

Stroebech Media

We have more than 40 years of experience in veterinary and human IVF media manufacturing. We offer a new and optimized media product line for *in vitro* embryo production. Protocols are simple and easy to follow. We have numerous solutions for immediate offers to individual customer support as well as training courses and Zoom sessions.

In addition to our existing product line, we are pleased to introduce our newest product: Equine One Step IVC medium.

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Research and Development

• Patents for growth factors and peptides are being explored

• Continuous monitoring of stability for guaranteed shelf life

www.stroebech-media.com
info@stroebech-media.com
Copenhagen, Denmark
Booth: 205

VetMotl Inc.

VetMotl Inc. (a subsidiary of DxNow, Inc.) is commercializing worldwide the VetMotl™ Sperm Separation Devices, first-of-their-kind devices for use in veterinary assisted reproductive technology procedures. We are a USA-based and globally recognized company who pioneered this innovative laboratory tool for preparing high-quality sperm samples. Our devices have been commercialized worldwide for use in human fertility clinics as ZyMōt® Sperm Separation Devices. VetMotl devices deliver increased efficiencies in blast development and viable implantable embryos in equine and bovine assisted reproductive procedures. VetMotl devices provide considerable time savings and standardization over traditional methods.

VetMotl Inc., a DxNow Inc. subsidiary
401 Professional Drive, Suite 130
Gaithersburg, MD 20879-3429 USA
www.VetMotl.com
Booth: 403

Vetoquinol USA Inc.

Headquartered in Fort Worth, Texas, Vetoquinol USA is owned by Vetoquinol S.A., an independent, family-owned French pharmaceutical company founded in 1933. Dedicated exclusively to animal health, Vetoquinol USA is focused on the development, production, and marketing of FDA, EPA, NASC, and AAFCO-regulated pharmaceutical, nutritional, and dermatological products for small and large animals.

4250 N. Sylvania Ave.
Fort Worth, TX 76137
www.vetoquinolusa.com/
Booth: 102

WTA Technologies LLC

WTA, Watanabe Applied Technologies, is a Brazilian technology company that offers products to the livestock reproductive services industry with a US branch in College Station, Texas.

For 20 years, WTA has provided specialized ovum pickup (OPU), *in vitro* fertilization (IVF), embryo transfer (ET), and artificial insemination (AI) equipment for cattle, horses, and small ruminants to practitioners around the globe. Reproductive laboratories trust WTA's innovative embryo production and transport equipment to maximize efficiency.

WTA offers durable and reliable equipment designed specifically for livestock practitioners and reproductive service providers at competitive prices.

WTA has been proud to be a leading manufacturer of reproductive equipment that is trusted from South America to Asia and Europe. Our College Station branch has been providing equipment and services to the US repro industry, including many leading embryo production companies, for over 10 years.

Visit us at booths 503 and 505.

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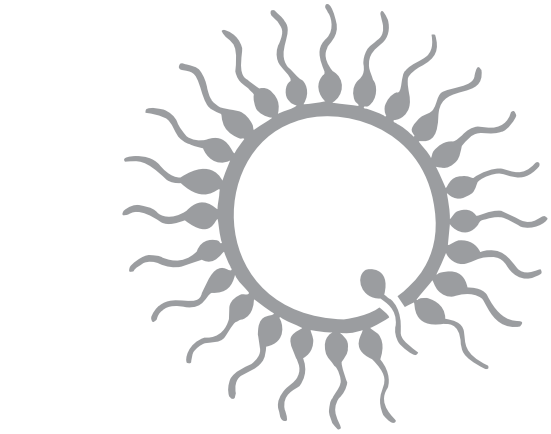
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WTA

IETS Preconference Symposium
Communicating and Demystifying Bovine Embryo Assisted Reproductive Technologies

Monday, January 8

Sponsored by Colorado State University, University of Illinois, IETS, AETA, Ovitra Biotechnologies, Partnar Animal Health, and Professional Embryo Transfer Supply Inc. (PETS).

Part 1: Effective Communication of Bovine Embryo Assisted Reproductive Technologies

Led by Jennifer Barfield and Matthew B. Wheeler

8:00 am – 12:00 pm (Colorado State University Spur Campus, Denver)

Breakout Group 1: Communication Between Practitioners and Clients

Intended for administrators, applied academics, ET practitioners, and ET/IVF clients. The format will include case studies, breakout groups and practical applications.

Purpose:

1. Explore producers' experiences with assisted reproduction in cattle. Identify common successes and frustrations.
2. Develop tools to improve communication and clarity between producers, veterinarians, and assisted reproduction professionals and vendors.
3. Develop or strengthen positive working relationships.

Agenda:

- Welcome and Grounding (8:00 am)
- Producer Panel – Experiences and outcomes with assisted reproduction
- Context and Challenges – Understanding the imperfect nature of the science and its application.
- Tool Development – Developing common language for shared understanding and expectations.
- Break (sponsored by PETS)
- Practitioner Panel – Experiences and outcomes dealing with producers/clients
- Next Steps
- Closing (11:45)

Breakout Group 2: Communication Strategies for Researchers

Led by Nicole Kelp.

Intended for academics (basic or applied), graduate/undergraduate students, and administrators. The format will include lecture and interactive demonstrations of scientific communication.

Purpose:

1. Understand the science of science communication, i.e. how people perceive and process information.
2. Explore effective strategies for inclusive communication including how to communicate uncertainty in science or address misinformation.
3. Practice communication strategies and garner feedback from experts and laypeople.

Agenda:

- Welcome and grounding
- Presentation – The science of science communication

- Break (sponsored by PETS)
- Role playing and interactive instruction on communication strategies
- Feedback from experts and non-experts
- Discussion of take-away strategies for effective communication
- Closing (11:45 am)

12:00 pm – 1:00 pm: Lunch will be provided at the National Western Stock Show

Part 2: Demystifying Bovine Embryo Assisted Reproductive Technologies

Led by Matthew B. Wheeler and Jennifer Barfield

1:00 pm – 5:00: pm National Western Stock Show

All activities will be interactive with audience participation.

Activity 1: Ovum Pick-Up (OPU)—Setup and Equipment (Andre Dayan and Nate Dorshorst))

This activity will include a live demonstration of ovum pick-up on a superstimulated cow including discussion on ultrasound equipment and the probes, needles, and tubing required for the procedure. Equipment from different manufacturers and several practitioners that use the specific equipment will be on hand. Workshop participants will have the opportunity to ask the practitioners questions regarding equipment use and setup during the demonstration.

The emphasis for this activity will be all things on the cow side, with respect to the aspirator and an assistant performing anything related to donor preparation, maintenance of sterile technique and temperature control, the OPU itself, and recording relevant information and data—basically everything leading up to the point of handing over the oocyte collection vessel to the laboratory.

This will be done in real-time so the workshop participants can see the real-life situation.

Activity 2: Conventional Non-Surgical Embryo Flushing—Setup and Equipment (Tom Rea and Brad R. Lindsey)

This activity will be a live demonstration of an embryo flush using a superovulated client-owned cow at the stock show. Different flushing equipment will be discussed and available for viewing along with catheters, filters, media, and tubing setups used for embryo flushing. We will have equipment from different manufacturers and several practitioners that use the specific equipment on hand in the arena area. Workshop participants will have the opportunity to ask practitioners questions regarding equipment use and setup during the demonstration. The equipment vendors will have the equipment available.

The emphasis for activity 2 will be all things on the cow side, with respect to the flusher, and an assistant performing duties related to donor preparation, maintenance of sterile technique and temperature control, the flush itself, recording relevant information and data—basically everything leading up to the point of handing over the embryo collection vessel to the laboratory.

This will be done in real-time so the workshop participants can see the real-life situation.

Activity 3: Recovery and Transport of the Oocyte/Embryos to the Laboratory (Jane Pryor – This will be simultaneous with the oocyte and embryo collections.)

Oocytes and embryos recovered in activities 1 and 2 will be identified and evaluated on a microscope with a camera. The live images will be projected onto 3 large screens in the arena and used as the basis for discussion. Topics for discussion will include handling and transport of oocytes and embryos. Workshop participants and the public will have the opportunity to look at embryos through a microscope during the social hour following the symposium. Vendors will have equipment on hand and participants can ask practitioners questions regarding equipment use and setup.

The emphasis for activity 3 will be primarily on the setup in the laboratory, media, rinsing the collection tube and filter, searching, grading, packaging, loading incubator, recording information and data, and shipping. Also, maintenance of sterile technique and temperature control will be emphasized.

This will be done in real-time so the workshop participants can see the real-life situation.

Break: 15–30 minutes (sponsored by PETS)

Activity 4: Decisions for Packaging and Distribution of Embryos to the Practitioner and Client (Brad R. Lindsey, Tom Rea, Luiz Nasser, Nate Dorshorst, and Jane Pryor)

Client embryos collected during activity 2 will be frozen on site. In addition, different methods for packaging and handling embryos after production will be demonstrated and discussed. The use of field incubators, embryo freezing equipment, and various packaging systems from a variety of manufacturers will be discussed and available in the arena for viewing.

Activity 4 will emphasize scenarios that require decisions in the laboratory regarding embryo handling and when to freeze (or not) and dealing with unexpected situations. Communication between laboratory personnel, the owner of the embryos, the owner or manager of the recipients, the practitioner and potentially a courier or shipping service, will be discussed with regard to these scenarios.

Activity 5: Transfer of Embryos in the Field (Luiz Nasser and Nate Dorshorst)

Methods to package IVP embryos after production for shipment to the field practitioner will be demonstrated and discussed. The use of field incubators, transport incubators, and various embryo delivery systems will be covered. Equipment from different manufacturers will be used during the demonstrations and several practitioners that use the specific equipment will be on hand. Workshop participants will have the opportunity to ask the practitioners questions regarding equipment use and setup. Equipment vendors will have equipment on display in the back of the stockyard arena for follow-up questions and discussion.

Activity 5 will emphasize the handling of the embryos once received from the laboratory, all the way through to the transfers, thus, potentially, unloading embryos out of tubes and into straws. Thus, this activity may also include discussions of temperature control, organization and coordination of unloading tubes, and so on, to ensure optimal throughput and recording information and data.

Activity 6: Final Group Discussion (All presenters and participants)

Dr. Andre Dayan, WTA Inc., and Dayan LLC, College Station, TX

Dr. Nate Dorshorst, GenOvations Inc., Lodi, WI

Dr. Brad R. Lindsey, Ovitra Biotechnologies, Midland, TX

Dr. Tom Rea, Genetics West, Berthoud, CO

Ms. Jane Pryor, Texas A&M University and Ovitra Biotechnologies, College Station, TX

Dr. Luiz Nasser, BORN Biotechnologies, Panama City, Panama

Happy Hour hosted at the Herd Sire Saloon in the National Western Stockyard Event Center

IETS Preconference Symposium
Best Practices in IVP – Tips, Tricks, and Lab Management in Cattle and Human IVF Clinics

Tuesday, January 9

Location: Hyatt Regency, Denver, Centennial Ballroom ABC

Sponsored by Colorado Center for Reproductive Medicine, Colorado State University, University of Illinois, IETS, and Professional Embryo Transfer Supply Inc. (PETS)

8:00 am – 8:30 am: Introduction

General background, introduction of speakers, designation of groups for rotating stations

Participants will be split into two groups, rotating between sessions for each part.

Part 1: Laboratory techniques in bovine and human IVF clinics

8:30 am – 9:50 am: Session A

Station I Embryo and Oocyte Handling (Dr. Jennifer Barfield)

Participants will be guided through hands-on exercises in embryo handling. Equipment for handling and moving oocytes will be available for use as well as examples of methods for packaging and shipping embryos. Breakout tables demonstrating media preparation and highlighting the differences in bovine OPU and human oocyte retrieval will be open for participants throughout the morning session.

Station II Embryo Development and Culture (Dr. Jeremy Block and CCRM)

Participants will rotate through breakout stations with demonstrations and hands-on activities comparing human and bovine ART, including embryo grading and development in bovine, fertilization techniques, and embryo culture techniques.

9:50 am – 10:10 am: Break

10:10 am – 11:50 am: Session B

Station III Vitrification and Warming (Drs. Jeremy Block and Jennifer Barfield)

Participants will be guided through hands-on exercises in vitrification and warming, including timed group practices of bovine embryo vitrification.

Station IV Technologies in the Human IVF World (CCRM and innovators in the ART industry)

Participants will rotate through breakout stations with new and emerging technologies from the human IVF laboratory. Hands-on participation and discussions on integrating these technologies into the bovine world is encouraged!

11:50 am – 12:00 pm: Morning closing remarks and intro to Part 2

12:00 pm – 1:00 pm: Lunch (on your own)

Part 2: Skills Test Relay

1:00 pm – 2:00 pm: Show off skills learned in a fun, interactive, repro themed relay race

Sponsored by PETS

2:00 pm – 2:15 pm: Break

Part 3: Laboratory Logistics and Careers

2:15 pm – 3:15 pm: How to run an IVF lab: Tips, tricks, and best practices for laboratories

Laboratory professionals will discuss different strategies for running bovine and human IVF laboratories.

1. Jason E. Swain, PhD, HCLD, *CCRM Chief Laboratory Officer and President of Laboratory Operations*
2. Devon Boyer, *GenOvations Operations Manager*

3:15 pm – 4:45 pm: Panel discussion: Career development in human and cattle embryology/art

An open discussion about career paths and "day-to-day life" of varied professionals in both animal and human reproduction labs.

1. Jason E. Swain, PhD, HCLD, *CCRM Chief Laboratory Officer and President of Laboratory Operations*
2. Ulises Martinez, *CCRM Human Clinical Embryologist*
3. Devon Boyer, *GenOvations Operations Manager*
4. Jeremy Block, PhD, *University of Wyoming, Assistant Professor Animal Sciences*

4:45 pm – 5:00: pm Final discussion and wrap-up

CANDES Preconference Symposium
A Quarter Century of CANDES: State-of-the-ART in Companion Animals, Nondomestic and Endangered Species

Tuesday, January 9

08:00 – 08:30 Registration

08:30 – 08:45 Welcome and introductory remarks

Session I Chair: Laura Adams, Utah State University

08:45 – 09:30 A quarter century of CANDES: What is the state of the art in companion animals, non-domestic and endangered species?
Gabriela Mastromonaco, Toronto Zoo, Canada

09:30 – 10:15 That was then, this is now – Over two decades of progress in rhinoceros reproductive science
Terri Roth, Cincinnati Zoo and Botanical Garden, USA

10:15 – 10:45 Break

Session II Chair: Morgan Orsolini, Duke University

10:45 – 11:30 Cold dogs: Sperm freezing, artificial insemination, and non-invasive behavioral tools to facilitate a hybrid conservation management approach for endangered African wild dogs
Damien Paris, James Cook University, Australia

11:30 – 12:15 *In situ* and *ex situ* jaguar reproduction: What do we have so far?
Thyara Deco-Souza, Federal University of Mato Grosso do Sul, Brazil

12:15 – 13:30 Lunch (on your own)

Session III Chair: Jessica Wittenstein, Colorado State University

13:30 – 14:15 Conservation of teleost fishes: Application of reproductive technologies
Ian Mayer, Norwegian University of Life Sciences, Norway

14:15 – 14:45 CANDES Trainee Travel Awards

The efficiency of an adapted bovine IVF protocol to produce *in vitro*-derived embryos from oocytes collected via surgical ovum pickup from live white-tailed deer (*Odocoileus virginianus*) donors under captivity in central Illinois
Elizabeth Bangert, University of Illinois, Urbana-Champaign

Capturing the miracle: Time-lapse imaging of equine embryos reveals cleavage patterns impact pregnancy success
Soledad Martin-Pelaez, University of California, Davis

14:45 – 15:15 Break

Session IV Chair: Renata Blocher, Utah State University

15:15 – 16:00 Wildlife biobanking for *in situ* and *ex situ* conservation in Japan
Mayako Fujihara, Wildlife Research Center of Kyoto University, Japan

Keynote lecture

16:00 – 16:45 Uncovering the mysteries of breeding in belugas (*Delphinapterus leucas*) – A little biology and a lot of behavior

Heather Hill, St. Mary's University, USA

16:45 – 17:00 Final discussion and remarks

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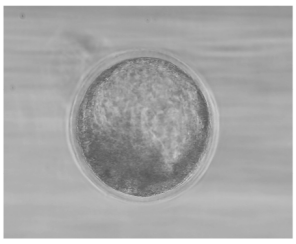
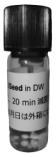


Clear view of bivine blastocyst in our straw

Self-ice-nucleating droplet

iSeed



This droplet upgrades your straw
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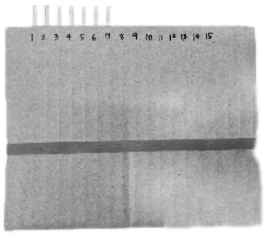
a carbon trestle for heat sealing
of multiple straws



Animo Science

@AnimoScience84

◎Contact : Inquiry, Shopping assistance, Request for quotation

E-mail ：info@animoscience.co.jp

Website ：https//animoscience.co.jp

Tel ：+81 90-9546-1961 (Toshiyuki Kojima, Ph.D.)

◎Manufacturer & Distributer ： AnimoScience Co. Ltd.,（323-6 Higashiarai, Miuma Ward, Saitama City, Saitama Prefecture, 337-0032, Japan）

◎Manufacturer : Tsuyama Gunze Co.Ltd., (Tsuyama City, Okayama) ◎Sales Partner ： Meiji Feed Co. Ltd.,（Koto Ward, Tokyo）

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