IETS 2026 Annual Conference
PROGRAM

Panama City, Panama
January 17–20, 2026

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52nd Annual Conference of the International Embryo Technology Society

Transformative Advances and Innovative Solutions in Reproductive Technologies

Sheraton Grand
Panama City, Panama
January 16–20, 2026

Scientific Program Co-Chairs
Alan Ealy and Joanna Souza-Fabjan

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2026 IETS Annual Conference
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Visit the IETS 2026 Annual Conference website

https://www.iets.org/2026

Preface

Welcome to the 52nd IETS Annual Conference!

Our society continues to expand its scientific reach and global impact, and it is a privilege to host this year's meeting in **Panama City**, a unique crossroads of cultures, biodiversity, and scientific opportunity. The IETS community has grown tremendously since its beginnings more than five decades ago, and its commitment to rigorous scientific exchange and innovation remains as strong as ever.

Panama offers an extraordinary scenery for this meeting. We encourage you to take the opportunity to explore its rich history, from the engineering marvel of the Panama Canal to the vibrant Casco Viejo, and the remarkable biodiversity that surrounds the city, from urban forests to nearby tropical ecosystems. We hope you enjoy not only science, but also the culture, landscapes, and hospitality that make this country so extraordinary.

This year's scientific theme, "**Transformative advances and innovative solutions in reproductive technologies**" will be showcased through four main session foci:

- Reproductive management in relation to climate
- Emerging embryo culture and molecular technologies
- Lessons from non-Bovidae species
- Recent insights into sperm–oocyte interactions

Together, these sessions explore how environmental pressures, species diversity, and molecular innovation drive reproductive efficiency and early developmental success.

We are honored that **Dr. Eckhard Wolf**, from the Center for Innovative Medical Models at Ludwig Maximilian University (Munich, Germany), will deliver the **George E. Seidel Jr. Keynote Lecture**, entitled "*Translational pig models for human diseases*." This lecture highlights how sophisticated animal models can bridge fundamental reproductive biology and human medicine, capturing the spirit of innovation that defines the IETS.

The scientific program is preceded by two full-day preconference symposia on Saturday, January 17. The **CANDES 2026 Preconference Symposium**, "*Transformative Advances in Wildlife Reproductive Technologies*," will explore the integration of assisted reproductive technologies, biobanking, cloning, and stem-cell approaches across a broad diversity of non-domestic species.

In parallel, the **Local Organizing Committee Preconference Symposium**, "*Bridging Science and Practice: Innovations in Bovine Reproductive Management*," will bring together researchers and industry partners to discuss practical strategies to enhance fertility and reproductive efficiency in beef and dairy systems, particularly under tropical and subtropical conditions.

Throughout the meeting, the program also features IETS Foundation student research competitions, the Peter W. Farin Trainee Travel Scholarship presentations, and multiple awards sessions. On Monday evening, concurrent Practitioners' Forum and DABE Forum sessions will provide a focused environment for field-oriented discussion and for advances in domestic animal biomedical embryology.

We are particularly pleased to highlight the **Morulas Trainee Group**, whose members will contribute within the main sessions and participate in dedicated trainee sessions and networking events, including the Morulas Mentor Lunch, Forum, and Mixer. Supporting and empowering the next generation of reproductive scientists and practitioners remains central to the IETS mission.

Finally, we invite you to join us for the **Closing Ceremony** and Party on Tuesday evening, when we will celebrate the achievements of our community, recognize award and competition winners, and look ahead to IETS 2027 in Porto, Portugal.

We extend our sincere thanks to all invited speakers, abstract authors, reviewers, committee members, sponsors, exhibitors, and the Local Organizing Committee. We are also grateful to the IETS Board of Governors for their confidence in inviting us to serve as program co-chairs, an honor we deeply appreciate. And to all participants:

thank you for being part of the IETS family and for your ongoing commitment to advancing reproductive technologies worldwide.

Welcome to Panama City and enjoy the 52nd IETS Annual Conference!

Alan D. Ealy & Joanna M. G. de Souza Fabjan
Program Co-Chairs, IETS 2026 Annual Meeting

Acknowledgments

We would like to express our highest gratitude to everyone who generously gave their valuable time to organize this meeting.

Thank you to all invited speakers for accepting our invitation to share their valuable knowledge, and for dedicating their time to comply with the deadlines. We are also very thankful to all manuscript reviewers for providing constructive and insightful comments to the manuscripts submitted by the invited speakers.

Thank you to all abstract authors for sharing their high-quality scientific findings and practical updates. Abstract session chairs and abstract reviewers have worked intensively to evaluate abstracts and make decisions to invite the research as poster or oral presentations. We are truly thankful for your tremendous amount of work.

Thank you, all members of the CANDES and Bovine committees, for organizing the pre-conferences. Special thank you to Brad Lindsey, Matt Wheeler, and Sofia Ortega for organizing the forums. We also sincerely thank all colleagues who steered different committees to bring excitement to this Annual Conference while keeping our core interests.

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

We have been extremely honored to co-chair the program of the IETS 52nd Annual Conference in Panama City, Panama. We thank the Executive Board, Marc-André Sirard, Ann Van Soom, and Brad Lindsey for extending the invitation to us, and all the support from the Board of Governors during the preparation of the conference program. Thank you for placing your trust in us with such an important responsibility!

Finally, we thank you all, IETS members, for attending the 2026 IETS Annual Meeting!

Joanna Souza-Fabjan and Alan Ealy
IETS 2026 Program Co-Chairs

Special Events

Saturday, January 17

Bovine Reproduction Preconference Symposium
08:30–17:00
Gran Baru II, a reception at the pool to follow
Additional registration required

Companion Animals, Non-Domestic and Endangered Species (CANDES) Preconference Symposium: Transformative Advances in Wildlife Reproductive Technologies
08:30–17:00
Gran Baru I
Additional registration required

Sunday, January 18

Morulas Mentor Lunch
12:30–14:00
La Caleta
Additional registration required

The IETS Morulas invite all young researchers to the Morulas Mentor Lunch, which aims to provide trainees the opportunity to network with senior members of IETS. Six mentors will join the lunch and share their wisdom.

Welcome Reception
18:00–20:00
Grand Salon

Join IETS and the exhibitors as we kick off IETS 2026! Light hors d'oeuvres will be served, and a cash bar will be available. This event is open to all registrants and guests.

Morulas Forum Business Meeting
20:00–21:00
La Caleta

After the Welcome Reception, join the Morulas in celebrating their 2025 achievements and help shape their future as they outline goals for 2026 and vote for their incoming Board. This is a great opportunity for all Morulas and new researchers to get involved, share ideas, and make connections within the community!

Student Mixer—Hosted by the IETS Morulas
21:00–22:00
La Caleta

Following the business meeting, the Morulas will be hosting a casual social event for all students and trainees. This annual gathering is the perfect opportunity to connect with friends, meet new people, and build lasting relationships.

Monday, January 19

IETS Business Meeting
10:45–11:15
Grand Ancon

This session will provide essential updates on the IETS strategic plan and future programs. Don't miss this opportunity to learn about the direction and goals of your organization!

Tuesday, January 20

Morulas Career Lunch
12:00–13:30
La Caleta
Additional registration required

The IETS Morulas invite all young researchers to the Morulas Career Lunch, which aims to provide trainees the opportunity to network with senior members of IETS. Explore career pathways and opportunities in embryo technology.

IETS Closing Party—Sponsored by Vetoquinol
18:00–21:00
Panama Viejo Cathedral
Additional registration required

Celebrate the conclusion of the 2026 IETS Annual Conference at the Cathedral in Panamá Viejo, one of the remaining parts of the original Panama City, the former capital of Panama, which was destroyed in 1671 by the Welsh privateer Henry Morgan. The location of our social has been a World Heritage Site since 1997.

Award Presentations

Sunday, January 18

Distinguished Practitioner Award
17:15–17:45
Grand Ancon

The Distinguished Practitioner Award recognizes an embryo transfer practitioner who has distinguished themselves by making exceptional, lifetime contributions to the field of embryo technology.

Tuesday, January 20

IETS Foundation Early Career Achievement Awards
11:00–12:00
Grand Ancon

This award recognizes two individuals—one scientist and one practicing professional—for their independent contributions toward advancing the field of embryo transfer and its associated technologies.

Pioneer Award
13:30–14:00
Grand Ancon

The Pioneer Award recognizes individuals who have made seminal contributions to the development of embryo-based technologies.

Student Competition Awards & CSIRO Best Poster Award
14:30–14:50
Grand Ancon

The IETS Foundation supports the next generation of scientists in embryo transfer and related technologies through continuing education and opportunities like the undergraduate and graduate student poster competitions. These competitions encourage students to present their research, engage with the IETS community, and explore careers in this dynamic field.

Poster Schedule
Taboga and Contadora I–II

Sunday, January 18: Posters must be set up by 07:00.
Tuesday, January 20: Posters can be removed after 13:30.

Exhibit Hall Schedule
Gran Salon Ballroom

Saturday, January 17: Exhibit set-up from 13:00–17:00
Sunday, January 18: 08:00–20:00

- Note: The Welcome Reception will take place in the exhibits area from 18:00–20:00

Monday, January 19: 08:00–17:30
Tuesday, January 20: 09:00–13:30

- Note: Exhibit teardown after 13:30

Registration Schedule
Gran Salon Foyer

Saturday, January 17, 7:00–17:00
Sunday, January 18, 6:30–18:00
Monday, January 19, 7:00–17:00
Tuesday, January 20, 8:30–15:00

Program

Friday, January 16

IETS Board of Governors

13:00 – 20:00 Board meeting Cocle

Saturday, January 17

07:00 – 17:00 Registration Gran Salon Foyer

IETS Board of Governors

08:00 – 17:00 IETS Board meeting Cocle
17:30 – 20:00 Foundation meeting Cocle

HASAC Committee Meetings

08:00 – 17:00 8:00–8:45 Manual Subcommittee
9:00–10:45 Forms and Certificates Subcommittee
11:00–12:00 Research Subcommittee
12:00–12:45 Lunch (invite only)
12:45–14:45 Research Subcommittee (cont.)
15:00–17:00 Regulatory Subcommittee La Caleta

Bovine Reproduction Preconference Symposium

08:30 – 17:00 Bridging science and practice: Innovations in bovine reproductive management
Additional registration required Gran Baru II

08:30 – 09:00 Welcome and introductory remarks

Session I

Chaired by Matthew Wheeler, PhD, University of Illinois at Urbana-Champaign, USA

09:00 – 09:45 How improving well-being can increase livestock productivity
Janeen Salak-Johnson, PhD, Michigan State University, USA

09:45 – 10:30 Latest developments in synchronization programs for beef and dairy embryo recipients
Gabriel A. Bo, Med. Vet, MVSc, PhD, Instituto de Reproducción Animal Cordoba (IRAC), Argentina

10:30 – 11:00 Break

Session II

Chaired by Brittany Scott, MS, SMART Reproduction, USA

11:00 – 11:45 Embryonic loss, impact on calf production for dairy and beef herds in tropical environments
Roberto Sartori, PhD, DVM, University of São Paulo, Brazil

11:45 – 12:30 The high-fertility cycle in dairy cows
Milo Wiltbank, PhD, University of Wisconsin–Madison, USA
Paul Fricke, PhD, University of Wisconsin–Madison, USA

12:30 – 13:30 Lunch (Bovine Preconference attendees only)

Session III

Co-Chaired by Brittany Scott and Matthew Wheeler

13:30 – 14:15 Exploring the role of metabolomics in understanding the factors associated with fertility in beef cattle
Pietro S. Baruselli, PhD, University of São Paulo, Brazil

14:15 – 15:00 Challenges for implementation of large-scale programs with *in vitro*-produced embryos
Rodrigo Mendes Untura, DVM, ABS Global, Brazil

15:00 – 15:30 Break

Session IV

Chaired by Luiz Nasser, PhD, Born Animal Biotechnology Corporation, Panama

15:30 – 17:00 Roundtable discussion
Featuring all speakers and moderators

17:00 – 18:00 Hosted happy hour (Bovine Preconference attendees only)

CANDES Preconference Symposium

Sponsored by Toronto Zoo

08:30 – 17:00 Transformative advances in wildlife reproductive technologies
Additional registration required Gran Baru I

08:30 – 08:45 Welcome and opening remarks

Session I

08:45 – 09:30 Integrating assisted reproductive technologies for wildlife conservation: 20 years' experience on the collared peccary
Alexandre Rodrigues Silva, DVM, PhD, Federal University of Semiarid Region, Brazil

09:30 – 10:15 Application of assisted reproduction in exotic bird species to improve species conservation and genetic diversity
Dominik Fischer, Dr. Vet Med, DipECZM (WPH)
Greifvogelstation und Wildfreigehege Hellenthal and Der Grüne Zoo, Germany

10:15 – 10:45 Break

Session II

10:45 – 11:30 Bridging science and survival: A model for integrating assisted reproductive technologies, biobanking, and conservation in Panama and beyond
Gina Della Togna, PhD, Amphibian Survival Alliance and Smithsonian Tropical Research Institute, Panama

11:30 – 12:15 Assisted reproduction in snakes: What do we know?
Rogerio Zacariotti, PhD, DVM, Scientia Nature, Brazil

12:15 – 13:30 Lunch (CANDES attendees only)

Session III

13:30 – 15:00 Roundtable discussion: Cloning of CANDES species
Moderated by
Andres Gambini, DVM, PhD, University of Queensland, Australia
Cesare Galli, DVM, Avantea, Italy
Gabriela Mastromonaco, PhD, Toronto Zoo, Canada

15:00 – 15:30 Break

Session IV

15:30 – 15:45 CANDES Trainee Travel Award
Abstract 9: Induction of follicular wave emergence in alpacas adapted to coastal conditions: a case report
Luciana Hidalgo Y, Student, Universidad Científica del Sur, Peru

15:45 – 16:00 Abstract 21: Morphological evaluation, in vitro maturation, and embryo production from oocytes of single individuals of kodkod (Leopardus guigna) and puma (Puma concolor): A case report
Daniel Veraguas, DVM, Universidad de Chile, Chile

16:00 – 16:45 Keynote Lecture: Stem cell zoo—A platform for exploring species-specific biological time
Miki Ebisuya-Matsuda, PhD, Technische Universität Dresden, Germany

16:45 – 17:00 Final discussion and remarks

Sunday, January 18

06:30 – 18:00 Registration Gran Salon Foyer

07:00 – 08:00 Past Presidents' breakfast Cocle

07:00 – 08:00 Student Competition finalists breakfast La Caleta

08:00 – 08:15 Welcome and opening remarks Gran Ancon

Session I: Managing Reproductive Health in Complex Environments

Chaired by Jeremy Block, PhD, University of Wyoming, USA
Travel trainee session co-chair: Judith Diaz-Muñoz, PhD Fellow, Autonomous University of Barcelona, Spain
Gran Ancon

08:15 – 09:00 Synchronized breeding and reproductive resilience in dairy cattle: Mitigating metritis, heat stress, and transgenerational fertility impairment
Fabio Lima, PhD, DVM, University of California-Davis, USA

09:00 – 09:15 Abstract 16: ReBreed21 program for timed embryo transfer in beef cattle: Field data evaluation
Mirela Balistrieri, MSc, DVM, University of São Paulo, Brazil

09:15 – 09:30 Abstract 115: Heat stress alters the miRNA cargo of pre-ovulatory follicular fluid extracellular vesicles and reduces fertility in dairy cattle
Bianca Gasparrini, PhD, DVM, University of Napoli, Napoli, Italy

09:30 – 10:15 External factors influencing reproductive tract microbiota
Rebecca Poole, PhD, Texas A&M University, USA

10:15 – 10:30 Abstract 92: Strategy to improve pregnancy rates with *in vitro*-produced embryos in the tropics
Reinaldo De Armas, PhD, University of Panama, Panama

10:30 – 11:00 Exhibit and poster break
Network with the exhibitors and sponsors!

IETS Foundation Student Research Competition Presentations

Gran Ancon

11:00 – 11:15 Abstract 1: Cattle embryos undergo normal early elongation in the absence of embryonic disc
Inés Flores-Borobia, PhD Candidate, INIA-CSIC, Spain

11:15 – 11:30 Abstract 2: Maternal-embryo crosstalk via extracellular vesicle miRNAs during embryonic reactivation after diapause in roe deer (*Capreolus capreolus*)
Giuliana de Ávila Ferronato, PhD Candidate, INIA-CSIC, Spain

11:30 – 11:45 Abstract 3: Characterization and MIRNA profiling of oviductal extracellular vesicles in early pregnancy in the rabbit model
Jon Fernández González, PhD Candidate, Universidad Complutense de Madrid, Spain

11:45 – 12:00 Abstract 4: Changes in ovarian architecture are associated with advanced reproductive age in the South African cheetah
Anna Heinrich, PhD Candidate, Northwestern University, USA

12:00 – 12:15 Abstract 5: *TFAP2C* is essential for first lineage segregation and blastocyst formation in sheep
Nuria Martinez de los Reyes, PhD Candidate, INIA-CSIC, Spain

12:15 – 12:30 Abstract 6: Impact of chilling, cryopreservation, and freeze-drying on DNA fragmentation and PLCζ expression in koala (*Phascolarctos cinereus*) epididymal spermatozoa
Patricio Palacios, PhD Candidate, DVM, The University of Queensland, Australia

12:30 – 14:00 Lunch and exhibits
Gran Salon
Sponsored by PETS

12:30 – 14:00 IETS Board lunch with partner societies Cocle

12:30 – 14:00 Morulas mentor lunch La Caleta

12:30 – 14:00 HASAC Emerging Technology Subcommittee Azuero

Session II: Decoding Early Development: Emerging Technologies in Embryo Research

Chaired by Maria Belen Rabaglino, PhD, Utrecht University, Netherlands
Travel trainee session co-chair: Mary A. Oliver, PhD Candidate, Virginia Tech, USA
Gran Ancon

14:00 – 14:45 Deciphering bovine embryogenesis through cutting-edge molecular tools
Kun Zhang, PhD, Zhejiang University, China

14:45 – 15:00 Abstract 193: Volatolomic profiles of *in vitro*-produced bovine embryos
Monika Nõmm, Research Fellow, Estonian University of Life Sciences, Estonia

15:00 – 15:45 Extended embryo culture in ruminants: Illuminating a black box of early development
Priscila Ramos-Ibeas, DVM, INIA-CSIC, Spain

15:45 – 16:00 Abstract 85: Effect of zygotic ablation of progesterone receptor membrane component-1 on development and differentiation of bovine embryos produced in vitro
Jeremy Block, PhD, University of Wyoming, USA

16:00 – 16:15 Abstract 88: Successful nanoparticle-mediated delivery of transgenes and ribonucleoproteins to the preimplantation bovine embryo
Veronica Rubio, PhD Candidate, University of Florida, USA

16:15 – 16:45 Exhibits and poster break
Meet with the exhibitors and sponsors! Gran Salon

16:45 – 17:15 HASAC Open Forum

17:15 – 17:45 Distinguished Practitioner Award: Dr. Charles Looney Gran Ancon

18:00 – 20:00 Welcome reception
Socialize with attendees and sponsors/exhibitors! Gran Salon

20:00 – 21:00 Morulas Forum and Business Meeting La Caleta

21:00 – 22:00 Student mixer – Hosted by the IETS Morulas La Caleta

Monday, January 19

07:00 – 17:00 Registration Gran Salon Foyer

07:00 – 08:00 IETS Foundation organizational breakfast Cocle

Session III: Translating Reproductive Innovations Across Species

Chaired by Marcella Milazzotto, Universidade Federal do ABC, Brazil
Travel trainee session co-chair: Brette Poliakiwski, PhD Candidate, Texas A&M University, USA
Gran Ancon

08:00 – 08:45 When less really is more: Reducing embryo manipulation to lower metabolic stress and improving long term outcomes
Paolo Rinaudo, PhD, MD, University of California, USA

08:45 – 09:00 Abstract 176: Evaluating FGF2, LIF, and IGF1 supplementation during *in vitro* maturation to enhance equine ICSI embryo development
Joanne Smith, DVM, PhD Student, The University of Queensland, Australia

09:00 – 09:15 Abstract 121: CRISPR-Cas9 mediated β-lactoglobulin gene-editing in goat skin fibroblasts for somatic cell nuclear transfer
Mahipal Singh, PhD, Fort Valley State University, USA

09:15 – 10:00 Exploring the potential of prepubertal oocytes: A small ruminant model
Teresa Mogas, PhD, Universitat Autònoma de Barcelona, Spain

10:00 – 10:15 Abstract 41: *In vitro* production of alpaca blastocysts using vitrified oocytes and epididymal spermatozoa
Jaime Antonio Ruiz Bejar, MS, DVM, National University of Huancavelica, Peru

10:15 – 10:45 Exhibits and poster break
Meet with the exhibits and sponsors! Gran Salon

10:45 – 11:15 IETS business meeting Gran Ancon

Peter Farin Trainee Award Presentations

Gran Ancon

11:15 – 11:20 Introduction

11:20 – 11:25 Abstract 173: Extracellular vesicles from heat and oxidative stressed granulosa cells modulate bovine *in vitro* embryo development and quality
Judith Diaz-Muñoz, PhD Fellow, Autonomous University of Barcelona, Barcelona, Spain

11:25 – 11:30 Abstract 179: Rumen-protected methionine supplementation during the periconceptional period to beef cows induces persistent changes in DNA methylation in the whole blood of female offspring
Daniella Heredia, PhD, University of Florida, USA

11:30 – 11:35 Abstract 52: Effect of semen type on embryo development and pregnancy establishment after timed artificial insemination or fresh embryo transfer in multiparous Holstein cows
Megan Lauber, PhD, University of Wisconsin–Madison, USA

11:35 – 11:40 Abstract 209: Interleukin-6 restores embryonic disc development in bovine blastocysts placed into extended culture
Mary Ali Oliver, PhD Candidate, Virginia Tech, USA

11:40 – 11:45 Abstract 102: Spatial localization of avian and human influenza A virus receptors in male and female bovine reproductive tissues
Brette Poliakiwski, PhD Candidate, Texas A&M University, USA

11:45 – 13:15 Exhibitor and attendee networking lunch Gran Salon

11:45 – 13:15 Data Retrieval Committee meeting Cocle

Session IV: Pathways to Fertility: The Intricate Journey of Sperm Through the Reproductive Tract

Chaired by Beatriz Fernandez-Fuertes, PhD, INIA-CSIC, Spain
Travel trainee session co-chair: Megan Lauber, PhD, University of Wisconsin–Madison, USA
Gran Ancon

13:15 – 14:00 Sperm interaction with the female reproductive tract: Implications for bull fertility and heterospermic semen use
Sean Fair, PhD, University of Limerick, Ireland

14:00 – 14:15 Abstract 54: Sire fertility affects early pregnancy success but not the incidence of pregnancy loss
Florentino Paz Jose da Silva Junior, MS Candidate, The Ohio State University, USA

14:15 – 15:00 From reservoir to rendezvous: The journey of sperm through the oviduct
David Miller, PhD, University of Illinois Urbana-Champaign, USA

15:00 – 15:30 Abstract 45: Post-thaw nanoparticle sorting of bull sperm improves cryopreservation outcomes
Emily Nold-Schoelerman, MS Candidate, Iowa State University, USA

15:30 – 17:30 Exhibits and poster reception Gran Salon

Concurrent Sessions

Practitioner's Forum

Gran Ancon
Sponsored by Calier

17:30 – 19:30 Maximizing IVF Performance Through Bull-Specific Fertility Evaluation

17:30 – 17:45 Setting the stage
Brad Lindsey, PhD, Ovitra Biotechnology Inc., USA

17:45 – 18:00 Simplot system
Brady Hicks, PhD, J.R. Simplot Co., USA

18:00 – 18:15 Managing sire selection to maximize success at Trans Ova
Jon Schmidt, DVM, Trans Ova Genetics, USA

18:15 – 18:30 Turning data into embryos: Using bull fertility insights to drive results
Paula Rodriguez-Villamil, DVM, PhD, ABS Global/Genus plc, USA

18:30 – 19:30 Roundtable discussion
Moderated by
Brad Lindsey, PhD, Ovitra Biotechnology Inc., USA
Matthew Wheeler, PhD, University of Illinois at Urbana-Champaign, USA

DABE Forum

Gran Baru I

17:30 – 19:30 Cells to Organoids: Advances and Challenges

17:30 – 17:35 Introduction
Sofia Ortega, PhD, University of Wisconsin-Madison, USA

17:35 – 18:30 Characterization and applications of reproductive organoids
Riley Thompson-Brandhagen, DVM, PhD, DACT, College of Veterinary Medicine and Biomedical Sciences, Colorado State University, USA

18:30 – 18:45 Abstract 201: Establishment of endometrial organoids from cross-species mammalian models: Toward a comparative platform for uterine biology
Dong-Hyeok Kwon, PhD, Seoul National University, South Korea

18:45 – 19:00 Abstract 205: Hormonal modulation of bovine oviductal organoids derived from distinct anatomical regions
Dimitrios Rizos, PhD, INIA-CSIC, Spain

19:00 – 19:30 Questions and discussion

20:00 – 22:00 Presidents reception (invite only)

Tuesday, January 20

07:00 – 08:30 IETS Board of Governors' organizational breakfast Cocle

08:30 – 15:00 Registration Gran Salon Foyer

09:00 – 11:00 Poster and exhibitor networking session Gran Salon

IETS Foundation Early Career Achievement Award Presentations

Gran Ancon

11:00 – 11:30 Early Career Scientist: Dr. Sofia Ortega
Maternal and paternal contributions to early development and pregnancy success in cattle

11:30 – 12:00 Early Career Practitioner: Dr. Paula Rodriguez-Villamil
From concept to commercialization: Applied reproductive innovations shaping global livestock genetics

12:00 – 13:30 Lunch Gran Salon

12:00 – 13:30 Morulas mentor luncheon La Caleta

12:00 – 13:30 IETS Program Committee lunch Cocle

13:30 – 14:00 Pioneer Award presentation: Dr. Poul Hyttel Gran Ancon

Session V: George E Seidel Jr. Keynote Lecture

Co-Chaired by Joanna Souza-Fabjan and Alan Ealy

Travel trainee session co-chair: Daniella Heredia, PhD, University of Florida, USA

14:00 – 14:30 Translational pig models for human diseases
Eckhard Wolf, DVM, Center for Innovative Medical Models at Ludwig Maximilian University, Munich, Germany Gran Ancon

IETS Foundation Student Competition Award Announcements

Gran Ancon

14:30 – 14:35 CSIRO: Best Poster Recipient

14:35 – 14:40 Undergraduate Student Poster Competition Recipient

14:40 – 14:45 Graduate Student Competition Recipient

14:45 – 14:50 Award Recipient & Competition Finalist Photos

14:50 – 15:00 AETE/ICAR/AETA/SBTE Announcements Gran Ancon

15:00 – 15:30 Closing and invitation to IETS 2027 Gran Ancon

18:00 – 21:00 Closing party Panama Viejo Cathedral
Additional registration required
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Booth 3

Recipient of the IETS 2026 Pioneer Award

Professor Poul Hyttel

Poul Hyttel, DVM, PhD, DVSc, Dhc, R1, was born September 19, 1954, in Noerresundby, Denmark, to Inger and Bent Lis Hyttel. After the birth of his sister, Lene Hyttel, in September 1957, the family moved to Skagen, Denmark, the northernmost town of Jutland, the mainland of Denmark. Situated on a peninsula where the waters from the seas of Skagerak and Kattegat meet, Skagen is world renowned, especially by artists, for its magical evening light and beautiful scenery. Growing up in this remote coastal idyll, Hyttel developed an early fascination with animals, particularly wildlife, which endures today.

He began his scientific career in 1973 at the Royal Veterinary and Agricultural University (RVAU) in Copenhagen, Denmark, where he earned his doctor of veterinary medicine degree in 1979, and first developed his interest in embryology and reproduction. This was swiftly followed by a PhD in 1982, for which his thesis was entitled "Repeat Breeding and Early Embryology in Cattle," under the supervision of Professor Torben Greve, the 2011 recipient of the IETS Distinguished Service Award. During his PhD studies, Hyttel developed his electron microscopy skills and passion for ultrastructural analysis and ultra-fine morphological detail, which he initially applied to bovine blastocysts. This was followed by his ground-breaking ultrastructural analysis of oocyte maturation, fertilization, and embryonic development in cattle for his doctor of veterinary sciences degree in 1988 from RVAU. Two very special arrivals highlighted this time of Hyttel's life: the birth of his adored son, Mads, in 1985, and the birth of the first IVF calf in Europe in 1987, with himself and Henrik Callesen as members of Torben Greve's research team (Greve et al., 1989).

During this period, Hyttel established collaborations with leading international scientists in the field of assisted reproductive technology, extending his studies on gamete development, fertilization, and embryogenesis to many species, including horses, pigs, sheep, foxes, mice, tigers, and humans. Hyttel was one of the first scientists to describe the ultrastructural features of matured bovine oocytes following superovulation (Hyttel et al., 1986a), and in vitro maturation (Hyttel et al., 1986b) and the differences between in vivo– and in vitro–derived bovine embryos (Hyttel et al., 1988, 1989).

Hyttel was appointed professor of veterinary anatomy in the Department of Anatomy and Physiology at RVAU in 1990. Together with his lifelong friend and mentor, Torben Greve, the Reproduction Group at RVAU was established as an exciting hub for excellent research. Hyttel and Greve created a wonderful atmosphere where scientists from around the world came for long or short sabbaticals, and where basic and applied research on cattle, pigs, and horses was undertaken simultaneously. Leading by example, a strong collaborative ethos, and great fun were at the centre of the Reproduction Group. All students were supported to participate at international conferences, where they were introduced to renowned scientists and encouraged to participate in scientific discussions and debate. This environment, together with Hyttel's infectious curiosity and attention to detail, inspired many young researchers to continue working in the field of reproductive biology. It was also the starting point of many enduring friendships.

Hyttel remained professor of anatomy in the Department of Veterinary and Animal Sciences in the retitled Faculty of Health and Medical Sciences within the University of Copenhagen until his retirement in 2022. During his career, Hyttel secured more than €18 million in funding from the European Union, National Institutes of Health, and Danish Funding Instruments for research projects. His scientific remit has kept pace with the evolving funding landscape and rapidly developing omic technologies, expanding to include the fields of biomedicine, animal and human stem cells, and early embryonic development. In 2015, Hyttel founded the transnational Stem Cell Centre of Excellence in Neurology, BrainStem, supported by Innovation Fund Denmark. His contributions to the field of stem cell research are notable for their applications in both human disease modelling and veterinary medicine. Hyttel led several projects focused on the use of induced pluripotent stem cells (iPSCs) to model human diseases such as Parkinson's disease and Alzheimer's disease. By generating patient-specific cell lines from iPSCs, Hyttel and his team were able to study the pathology and progression of these diseases in vitro, leading to insights into early disease mechanisms and potential new drug targets (Okarmus et al., 2021; Stoklund Dittlau et al., 2023).

Hyttel's work in stem cell research also extended to veterinary applications, where he explored the use of canine and porcine models for studying diseases similar to those seen in humans. His studies on canine cognitive dysfunction syndrome, a condition that mirrors Alzheimer's disease in dogs, provided insights into how neurodegeneration can be modeled in nonhuman species. The use of porcine stem cells for regenerative therapies also brought Hyttel closer to applying stem cell technologies for tissue repair and regenerative medicine in veterinary practice.

Hyttel's early work on embryonic development in livestock, especially in cattle, brought him back to bovine embryology and to cofounding the EliteOva project in 2017, which he led until retirement. The EliteOva project, a landmark initiative supported by Innovation Fund Denmark, sought to optimize IVF technologies and incorporate genomics into the process of embryo production for elite cattle breeding. After three years of retirement, Hyttel has gradually returned to science; he has taken on a part-time role as a scientific advisor for Stroebech Media and ArtsMedia, where he contributes to staff training, conference exhibitions, and scientific input. This year, he also resumed teaching anatomy at the newly established veterinary university in Foulum, Denmark.

Throughout his career, Hyttel has made significant strides in genomic selection, embryo development, and disease modeling. He has been instrumental in merging the fields of genomics, embryology, and stem cell research, advancing both animal breeding and human health. Hyttel has always emphasized the importance of collaboration, and many of his most successful projects have involved partnerships with scientists from across the world. His sharp intellect, encyclopedic memory, infectious curiosity, and warm personality have enabled him to integrate different disciplines, ranging from embryology and genetics to stem cell biology and disease research, and more.

Hyttel's influence extended through teaching, mentorship, and leadership in scientific societies. He has held notable leadership positions, including president of IETS from 1997 to 1998, and served as a founding diplomate of the European College of Animal Reproduction. Hyttel has chaired and contributed to numerous scientific conferences, seminars, and summer schools, and played a key role in the European Union Horizon 2020 Twinning project, SEARMET (Scientific Excellence in Animal Reproductive Medicine and Embryo Technology). He is a prolific author, having published more than 280 refereed international articles; according to Google Scholar, his h-index is 69, based on nearly 16,000 citations. More than 40 PhD students and postdoctoral fellows have had the good fortune to be supervised by Hyttel. He was honored with Doctor Honoris Causa from the University of Antwerp (Antwerp, Belgium) in 2011, and the Estonian University of Life Sciences (Tartu, Estonia) recognized his contributions to veterinary and embryological sciences across Europe in 2018. In 2015, he was knighted first class, Order of Dannebrog, for his scientific and academic service to Denmark.

In the 1870s, Skagen became a renowned artists' colony; many of us who have worked with Hyttel will have had our theses and research papers enhanced by his wonderful drawings of oocyte and embryo development. His enduring curiosity, creativity, and passion for research have established a legacy of scientific revelations, making him a true pioneer in the fields of reproductive biotechnology and genomic research.

Hyttel is married to Inge, and they live in the coastal village of Hundested in the north of Sjaelland, Denmark. They have five wonderful grandchildren and are eagerly awaiting the arrival of their sixth. Lately, in addition to painting beautiful landscapes of Skagen and Hundested, Hyttel has revisited his library of electron micrographs and started to recolor them, ensuring their appeal for generations to come.

Tillykke Poul, en værdig modtager af IETS Pioneer Award 2026.

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Previous Recipients

P.J. Hansen (2025)
E. L. Squires (2024)
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)

Recipient of the 2026 IETS Distinguished Practitioner Award

Dr. Charles R. Looney

Dr. Charles R. Looney grew up in Camden, Arkansas, and later attended the University of Arkansas (U of A), where he completed his BA (1978) and MS (1979) in animal science. As an undergraduate, he was a member of the Alpha Gamma Rho Fraternity, Alpha Zeta Honor Society, the Animal Science Club, and the 1976 Livestock Judging team. He then pursued his PhD in animal science at Louisiana State University (LSU) under the direction of Dr. Robert A. Godke. At LSU, he was initiated into Gamma Sigma Delta and graduated in 1983. In 2014, he was honored by the U of A Science Department by being named an Advanced Graduate of Distinction. In 2023, he was inducted into the Arkansas Agricultural Hall of Fame.

After completing his PhD, Looney served Granada Biosciences for 10 years as a senior scientist, working in embryo transfer (ET) production. He was a member of the team that produced the first embryo-derived bovine clones and the first recombinant bovine FSH/LH. While working for Granada, he moved to the Hanford, California, office and established a cloning and IVF laboratory, working primarily with dairy clients. Looney also developed a cloning and IVF laboratory in Newcastle upon Tyne, United Kingdom. Both laboratories were successful in producing cloned and IVF offspring.

Following Granada, he offered private consulting to ET companies in Australia, France, Hungary, Mexico, and Brazil. Looney demonstrated the first Aloka curvilinear vaginal probe to Professor Chris Polge at the Animal Research Station in Cambridge, England. In 1992, Looney joined Trans Ova Genetics in Sioux Center, Iowa, as technical director, where he performed ET and managed their first IVF laboratory. He published the first journal article using transvaginal oocyte retrieval and IVF for problem cows and developed dominant follicle removal prior to superovulation to improve embryo production in donor cows.

As president of Ultimate Genetics (Franklin, TX), he and his team, in collaboration with leading partners, produced the first transgenic cloned calves and the first adult cloned bull. In 2001, he started OvaGenix in Bryan, Texas, which operated successfully for just under 20 years with over 600 clients in 5 countries. In 2018, Dr. Looney accepted the position of professor of cattle improvement for the State of Arkansas, from which he recently retired. He worked with extension research stations across the state and visited many cattle producers while also speaking and teaching at cattlemen's events.

Looney has spent the past 45 years traveling and promoting the cattle industry in the United States and around the world. He has spoken or worked in over 15 countries, setting up ET or IVF programs in Australia, Brazil, Argentina, Venezuela, Mexico, India, and France. He has been a member of IETS since 1978 and has served as a governor. He has also been a member of the American Embryo Transfer Association (AETA) since its formation and has served two terms on the AETA Board. In 2019, he was recognized by the AETA with the President's Award for Outstanding Service to the organization and the cattle industry.

Looney's research is continuous and has been documented in 31 reviewed publications, 76 abstracts, and numerous proceedings. He has sponsored 25 master's and PhD theses and dissertations from his time as an adjunct professor at Texas A&M University, The Ohio State University, LSU, and U of A.

Looney and his wife, Cathryn, married in 1978 and have three children and four grandchildren. When not behind a cow, he volunteers at his church and the Hope Lions Club, where he has served as president. He attributes his success in life to his faith in God and the support of his family.

It is with great honor that we present to you a most worthy recipient of the 2026 IETS Distinguished Practitioner Award, Dr. Charles R. Looney.

Previous Recipients

John Hasler (2025)

IETS Foundation 2026 Early Career Achievement Award (Practicing Professional)

Paula Rodriguez-Villamil is a Veterinarian and PhD in reproductive biotechnology, currently serving as Global Embryo Director at Genus plc. Throughout her career, she has been dedicated to advancing reproductive technologies in livestock, leading scientific, operational, and commercial programs across the bovine, porcine, and small-ruminant sectors.

She holds a DVM from the Universidad Nacional de Colombia, a Master's degree from UFRGS in Brazil, and a PhD from the Universidad Nacional de Córdoba in Argentina, complemented by postdoctoral research in proteomics and animal biotechnology at UFC in Brazil. Paula has directed high-performance IVF and embryo laboratories in Brazil, Argentina, and the United States, including serving as Embryology Lab Director at Recombinetics, where she led gene-edited animal production.

In her current global role at Genus/ABS Global, Paula drives R&D, product development, and the worldwide expansion of innovative embryo technologies, building affiliate networks and scaling operations across the Americas, Europe, and Asia. She is an active contributor to the scientific community through peer-reviewed publications, leadership roles at international conferences such as IETS, and ongoing participation in mentoring initiatives like Mothers in Science.

A passionate researcher and mentor, Paula integrates cutting-edge science with strategic vision to enhance genetic improvement and agricultural sustainability worldwide. She is also deeply committed to supporting women in STEM, through inclusive mentorship and advocacy.

IETS Foundation 2026 Early Career Achievement Award (Scientist)

Dr. Sofia Ortega is originally from Honduras and earned her B.S. in Agricultural Sciences from Zamorano Agriculture University and an M.S. in Animal Sciences from the Pontifical Catholic University of Chile. She completed her Ph.D. in Animal Molecular and Cellular Biology at the University of Florida under Dr. Peter Hansen, followed by postdoctoral training with Dr. Tom Spencer at the University of Missouri. She later served as an Assistant Professor of Reproductive Physiology at Missouri (2019–2022) before joining the Department of Animal and Dairy Sciences at the University of Wisconsin–Madison as an Assistant Professor of Reproductive Physiology.

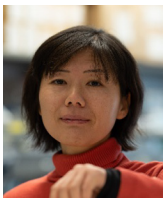
Dr. Ortega's research program investigates the physiological, genetic, and molecular mechanisms governing early embryonic development and pregnancy establishment in cattle. By integrating multi-omics with in vitro and in vivo embryo models, her work defines maternal and paternal determinants of embryo competence, placental development, and pregnancy success. Her long-term goal is to improve reproductive efficiency and fertility prediction in cattle through mechanistic discovery, while generating translational insights for human assisted reproduction.

Session Speakers and Keynote Biographies

Alexandre Rodrigues Silva

Veterinarian with Master's and Doctorate in Veterinary Sciences; Full Professor at the Center for Agricultural Sciences of the Federal Rural University of Semi-Arid - UFERSA; Productivity Researcher 1B of the CNPq; Deputy Coordinator of the Veterinary Medicine Area at CAPES; Member-Director of the Brazilian College of Animal Reproduction (CBRA); Member of the Fiscal Council of the Brazilian Association of Animal Andrology (ABRAA); Member of the Advisory Board of the Brazilian Association of Wildlife Veterinarians (ABRAVAS); Vice-President of the Canine Council of the Brazilian Cynological Confederation (CBKC); Coordinator of the Laboratory of Animal Germplasm Conservation (LCGA-UFERSA), where he develops research focused on the Study of Reproductive Physiology and Biotechnologies Applied to Dogs and Wild Animals, specially technologies for gametes and gonadal tissue preservation.

Miki Ebisuya-Matsuda



Miki Ebisuya did her undergraduate and PhD research at Kyoto University, Japan. After getting her PhD in 2008, she became a group leader at Kyoto University in 2009. Her lab moved to RIKEN in 2013, to the European Molecular Biology Laboratory (EMBL) Barcelona in 2018, and finally to Physics of Life (PoL), Technical University Dresden (TU Dresden) in 2023. Her research group focuses on recapitulating developmental processes using the stem cell zoo, a collection of pluripotent stem cells from various mammalian species.

Dominik Fischer

Dominik graduated from the University of Veterinary Medicine Hannover, Germany in 2009. Since then, he is the head veterinarian at the Bird of Prey Center and Wildlife Zoo Hellenthal. From 2009 to 2020 he worked at the Clinic for Birds, Reptiles, Amphibians and Fish of Justus Liebig University Giessen, Germany. There he completed his doctoral thesis (Dr. med. vet.) and worked on various scientific projects about infectious diseases and assisted reproduction in birds and reptiles. He earned a German national veterinary specialist status in avian medicine, in reptilian medicine and in zoo & wildlife medicine by examination. Moreover, he successfully completed a 3-years residency training of the European College of Zoological Medicine and earned the EVBS® Specialist status as Diplomate of the ECZM in Wildlife Population Health by examination. In December 2020, Dominik started a position as curator for science and for birds, reptiles, amphibians and fish at Zoo Wuppertal.

Gabriel A. Bo

Professor, National University of Villa María, Argentina. President and Director of Research and Graduate Studies at the Animal Reproduction Institute of Córdoba (IRAC).

He served as President of the International Embryo Technology Society (IETS), the Argentine Embryo Technology Society (SATE), and the Argentine Chamber of Artificial Insemination and Reproductive Biotechnologies (CABIA).

He has published more than 150 articles in peer-reviewed scientific journals and book chapters and has given lectures at conferences worldwide. He has received various awards and distinctions for his scientific career and is a Life Member of the International Embryo Transfer Society (IETS), Honorary Member of the American College of Theriogenologists and the National Academy of Agronomy and Veterinary Medicine of Argentina.

He recently received the Simmet Prize, awarded by the International Congress of Animal Reproduction (ICAR) and considered the most prestigious award in the world for a researcher working in Animal Reproduction. Finally, he was considered by Stanford University to be among the 2% of scientists with the greatest international impact in veterinary medicine.

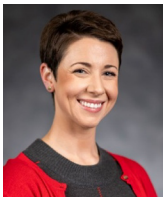
Roberto Sartori

Roberto Sartori received his Veterinary degree and Masters from School of Veterinary Medicine and Animal Science – São Paulo State University (1992 and 1997, respectively). His Ph.D. degree in Dairy Science was from University of Wisconsin-Madison (2002) in the area of Reproductive Physiology of Dairy Cattle. From 2004 to 2009, Roberto worked as a Researcher at Embrapa Genetic Resources and Biotechnology in Brazil. Currently, Dr. Sartori is an Associate Professor at the Department of Animal Science of the University of São Paulo (ESALQ/USP), Piracicaba, SP, Brazil. His main research interests are in physiology of reproduction in Bos taurus and Bos indicus, influence of nutrition on reproduction, reproductive biotechnologies, and reproductive efficiency in beef and dairy cattle. He has published more than 190 peer-reviewed papers with more than 6,600 citations and h-index 38.

Fabio Lima

Fabio Soares de Lima, DVM, MS, PhD, Diplomate ACT, is Associate Professor of Livestock Health and Theriogenology at the University of California, Davis. His research program integrates reproductive physiology, uterine health, microbiome–host interactions, and genetic strategies to optimize fertility and resilience in dairy cattle. With over 130 peer-reviewed publications, an h-index of 45, and leadership on >40 funded projects totaling nearly \$5 million, Dr. Lima has advanced global understanding of how heat stress and postpartum diseases compromise reproductive outcomes, and pioneered technologies—including estrous synchronization, embryo transfer applications, and genomic tools—to mitigate these effects. A recognized educator and mentor, he has trained graduate students and postdoctoral scholars worldwide while serving in leadership roles for the American Dairy Science Association, the Dairy Cattle Reproduction Council, and the American College of Theriogenology. Dr. Lima's keynote will highlight emerging insights and integrated strategies to enhance fertility, disease resistance, and sustainability in dairy herds under the challenges of a warming climate.

Rebecca Poole

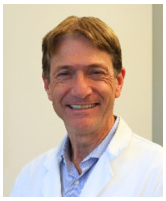


Rebecca "Becky" Poole is an Assistant Professor in Physiology of Reproduction in the Department of Animal Science at Texas A&M University. She received a B.S. in Animal Science from North Carolina State University (2014) before earning her M.S. in Animal and Poultry Sciences from Virginia Tech (2016) and Ph.D. in Animal Science from North Carolina State University (2019). She then was a Postdoctoral Research Associate in the Department of Animal Science at Texas A&M University from 2019 to 2021. During this time, she was awarded a USDA-AFRI Postdoctoral Fellowship focusing on the relationship between hormonal and immunological changes and the microbiome of the reproductive tract in cattle. In 2021, she continued at Texas A&M University as an Assistant Professor and her research program focuses on the reproductive tract microbiome in domestic livestock (e.g., beef cattle, dairy cattle, swine) and the role of these microbial communities in modulating reproductive efficiency. Ultimately, results generated by her research program are advancing the field of reproductive physiology and creating opportunities for meaningful improvements in the fertility of humans and domestic animals.

Kun Zhang

Dr. Zhang Kun is professor of reproductive biology and Head of the Department of Animal Science and Technology and Deputy Director of the Institute of Animal Genetics and Breeding at Zhejiang University. Holding a Ph.D. from the University of Florida (2011) and with postdoctoral experience at UMass Amherst and Michigan State University, he leads research on molecular mechanisms of bovine embryonic development and breeding applications of embryo technology. The long-term research goal of Dr. Zhang's lab is to apply knowledge acquired in understanding physiological, genetic and epigenetic regulation of oogenesis and early embryogenesis to improve fertility in both dairy and beef cattle and increase the efficiency of assisted reproductive technologies in both agricultural animals and human. Dr. Zhang has secured over 10 major grants (including NSFC and National Key R&D projects) and published 30+ papers in leading journals (e.g., Cell Reports, Development). He serves on editorial boards (Animal Reproduction Science, Journal of Zhejiang University) and councils (Chinese Society of Animal Science and Veterinary Medicine).

Paolo Rinaudo



Dr. Rinaudo, a Professor of Obstetrics and Gynecology at UCSF, specializes in infertility treatment. His research explores how in vitro fertilization (IVF) and embryo culture impact fetal and adult development. His lab developed a mouse model to study long-term health effects of IVF, including growth, blood pressure, glucose tolerance, and fat content. Another focus is on molecular mechanisms like ROS production, mitochondrial function, and epigenetic changes in cultured embryos. The goal is to optimize culture conditions, select the healthiest embryos, and improve outcomes.

Teresa Mogas

Teresa Mogas, DVM, PhD, is a professor in the Department of Animal Medicine and Surgery at the Autonomous University of Barcelona (Barcelona, Spain). Her research focuses on reproductive biotechnologies in mammals, particularly in vitro embryo production, and cryopreservation of oocytes, sperm, and embryos. Over the past two decades, her group has worked on improving vitrification and warming protocols for oocytes and in vitro–produced embryos through approaches such as mathematical modeling and cellular modification.

Sean Fair

Professor Fair completed his PhD at University College Dublin in 2006 and after two years at the University of Galway he joined the academic staff at the University of Limerick. He is now Professor of Animal Reproduction, Head of the Department of Biological Sciences and Principal Investigator at the Bernal research institute. His research group uses state-of-the-art physiological and molecular approaches to study the complex and multidimensional etiology of subfertility in farm animals. One of the main themes of his work is how sperm interact with the female reproductive tract and its secretions using both in vivo and in vitro models.

David Miller

David Miller was raised on a dairy farm in Minnesota, working on his parents' farm and developing his own small herd of dairy cows. He received his B.S. in Animal Sciences and M.S. in Animal Physiology from the University of Minnesota. After teaching at California Polytechnic and State University in San Luis Obispo, he earned his Ph.D. in Endocrinology and Reproductive Physiology from the University of Wisconsin-Madison, advised by Roy Ax. He performed post-doctoral research in the Biochemistry and Molecular Biology Department at the University of Texas-MD Anderson Cancer Center in Houston, TX under the tutelage of Barry Shur. He then took an Assistant Professor Position at the Unversity of Illinois in the Department of Animal Sciences. He has risen through the ranks and is now Professor of Animal Sciences and is also appointed in the Institute for Genomic Biology. He has mentored 45 graduate students and published nearly 100 original research papers. His research has been funded by the USDA-NIFA, NIH, and NSF and he has served on many review panels. He has received several teaching and research awards including the American Society of Animal Science Animal Physiology and Endocrinology Research Award.

Eckhard Wolf

Eckhard Wolf is Head of the Institute for Molecular Animal Breeding and Biotechnology and of the Center for Innovative Medical Models (CiMM; www.lmu.de/cimm/), LMU Munich. His lab is specialized in the generation, characterization and implementation of genetically engineered pigs as disease models (diabetes mellitus, rare monogenic diseases) and as organ donors for xenotransplantation. He leads the large animal platform in the German Center for Diabetes Research and was Spokesperson of the DFG CRC-TR 127 "Biology of xenogeneic cell, tissue and organ transplantation – from bench to bedside". E.W. is Member of the German National Academy of Sciences – Leopoldina, Corresponding Member of the Austrian Academy of Sciences, Member of the Bavarian Academy of Sciences and Humanities, and Diplomate of the European College of Laboratory Animal Medicine.

Pietro Baruselli

Pietro Baruselli is a Professor of Animal Reproduction at the University of São Paulo in Brazil. He holds an undergraduate degree in Veterinary Medicine (1985), a Master's degree (1992), and a PhD in Animal Reproduction (1997) from São Paulo University. He was president of the Brazilian Embryo Technology Society (SBTE/2012-2014), a member of the Executive Committee of the International Congress of Animal Reproduction (ICAR/2012-2022), and chair of the 45th Annual Conference of the International Embryo Technology Society (IETS) in New Orleans, USA (2019). Professor Baruselli´s research and teaching focus on controlling follicular dynamics and ovulation for self-appointed artificial insemination and embryo transfer in cattle (Bos indicus and Bos taurus) and buffalo (Bubalus bubalis). He has authored over 300 scientific publications and presented more than 700 abstracts at scientific congresses on a wide range of topics, including the physiology of reproduction, ovulation synchronization, reproductive biotechnology, and reproductive management. He has supervised 70 completed Master's and PhD candidatures and has extensive international experience.

Milo Wiltbank

Dr. Milo Wiltbank joined the faculty at the University of Wisconsin-Madison in 1991 in the Department of Dairy Science and is currently Professor of Animal and Dairy Sciences and Endocrinology-Reproductive Physiology. He has done research in reproductive physiology throughout his career. He currently has >250 scientific, peer-reviewed manuscripts in a number of research areas including interactions of nutrition and reproduction, the physiological basis for anovular cows, and hormonal regulation of the ovary. From a practical standpoint, he is probably best known for the development, validation, and modification of timed AI protocols such as Ovsynch and Double-Ovsynch. From a basic perspective, he has provided substantial new insights into the mechanisms involved in the regression of the corpus luteum (CL) and mechanisms involved in the selection of a single dominant follicle in cattle.

Paul Fricke

Dr. Paul M. Fricke was raised on his family's row crop and dairy farm located near Papillion, Nebraska where his family continues to farm today. After receiving a B.S. degree in Animal Science in 1988 from the University of Nebraska-Lincoln, Paul went on to complete an M.S. degree in 1992 and a Ph.D. degree in 1996 in Reproductive Physiology from the Department of Animal Sciences at North Dakota State University in Fargo, North Dakota. In 1996, Paul accepted a position as a Postdoctoral Research Associate in the Department of Dairy Science and the Department of Animal Health and Biomedical Sciences at the University of Wisconsin-Madison. Paul joined the faculty in the Department of Dairy Science at the University of Wisconsin-Madison on July 1, 1998, and he was promoted to Associate Professor with tenure in 2004 and to Full Professor in 2009. His current appointment is split between extension and research in dairy cattle reproduction.

Dr. Fricke's research program is focused on understanding the biology underlying the many reproductive problems presented by modern dairy cattle. Dr. Fricke has authored or co-authored 110 peer-reviewed journal publications, 145 abstracts, and 6 book chapters. He has mentored 16 M.S. and 7 Ph.D. students, and his research program has attracted $4.5 million in extramural research grants, contracts, and gifts. In 2014, Dr. Fricke was awarded a research sabbatical as a visiting scientist at the Teagasc Moorepark Animal & Grassland Research Innovation Centre in Fermoy, Co. Cork, Ireland.

The goal of Dr. Fricke's extension program is to improve reproductive efficiency of dairy cattle by applying knowledge gained through scientific research to develop practical management strategies and assess new reproductive technologies, and to disseminate that information throughout Wisconsin, the United States, and the world. Dr. Fricke is a sought-after speaker for dairy farmer, industry, and veterinary audiences. Since 1997, Paul has spoken to over 600 audiences in Wisconsin and has presented talks at conferences in 36 U.S. states and 6 Canadian provinces. In addition, Paul has been an invited speaker for international meetings in 28 foreign countries spanning 6 continents around the world.

Dr. Fricke is the recipient of several campus and national awards in recognition of his innovative applied dairy research and extension programs. In 2006, Dr. Fricke received the Midwest Section ASAS/ADSA Outstanding Young Extension Specialist Award and the University of Wisconsin-Madison College of Agricultural and Life Sciences Pound Extension Award. In 2008, Paul received the De Laval Dairy Extension Award from the National American Dairy Science Association honoring the top dairy extension specialist in the United States. In 2010, Paul received the Wisconsin Association of County Agriculture Agents Second Mile Award in recognition of his work with county agricultural extension agents in Wisconsin. In 2011, Paul was inducted into the Papillion – La Vista Schools (Nebraska) Foundation Distinguished Alumni Hall of Fame. In 2023, Paul received the UW-Extension Ag Institute Traveler award.

Paul lives in Waunakee, Wisconsin with his wife, Carol. They have three grown children.

Gina Della Togna

Dr. Gina Della Togna is a conservationist and researcher currently serving as the Executive Director of the Amphibian Survival Alliance and a Research Associate at the Smithsonian Tropical Research Institute. She earned her Ph.D. in Biological Sciences, specializing in Molecular and Cell Biology, from the University of Maryland, USA. Her pioneering research focuses on amphibian reproductive biology and Assisted Reproductive Technologies (ARTs) of endangered amphibians. Dr. Della Togna co-chairs the IUCN SSC Amphibian Specialist Group ARTs and Biobanking Working Group and is a co-author of the Amphibian Conservation Action Plan (ACAP). She actively participates in the IUCN SSC ASG Atelopus Task Force, and Co-chairs the Ex Situ Working Group of the Atelopus Survival Initiative (ASI). Dr. Della Togna serves on the Advisory Board of the Re:wild Fonseca Species Conservation Fund and is a member of the Executive Committee for the World Congress of Herpetology (2024-2032). Her dedicated efforts significantly contribute to global amphibian conservation.

Rogerio Zacariotti

Veterinarian with a solid academic background and over 25 years of experience in the management, reproduction, and conservation of wild animals such as the golden lancehead viper and other snakes, peccaries, giant anteater, white rhinoceros, black-faced lion tamarin, capybara, among others. Lecturer in Veterinary Medicine at the university level since 2003, and speaker at scientific events in Brazil, Ecuador, the United States, Mexico, Italy, and Panama. Currently CEO of the scientific and environmental consulting firm Scientia Nature, where he coordinates and develops projects for the management and conservation of wild species. Academic background: - Master's and Doctorate degrees from the Department of Animal Reproduction at the Faculty of Veterinary Medicine and Animal Science of USP (2002 - 2008); - Associate Researcher and Heller Foundation Fellow at the Reproductive Sciences Research Group of the San Diego Zoo Wildlife Alliance (USA) (2005 - 2006); - Postdoctoral fellowship at the Laboratory of Ecology and Evolution of the Butantan Institute (2009 - 2010); - Postdoctoral fellowship at the Reproductive Sciences Research Group of the San Diego Zoo Wildlife Alliance (USA) (2012 and 2014).

Brad Lindsey

Brad Lindsey received a BS in ag economics (1982) and a MAgr in animal science (1984), both from Texas A&M University. He received his PhD in animal science (1998) from University of Nebraska, with a research focus on exogenous control of endogenous gonadotropin release affecting dominant, persistent and super-stimulated ovarian follicle development in cattle. Lindsey developed the first transvaginal probe for OPU in cattle in the United States, as well as the first commercial IVF service in the United States, for Granada Biosciences in 1990 to 1991. He then started IVF services for Trans Ova Genetics in 1992 and later for Sexing Technologies in 2004. Between 2000 and 2005, Lindsey worked for AB Technology (now ABT360), Minitube of America (MOFA), Genetic Resources Int'l (now, Sexing Technologies), Stroud Veterinary Embryo Services, and OvaGenix in various technical support roles, directing research, product development, providing and integrating complete panels of reproductive services, ART and IVF laboratory service platforms. In 2005, Lindsey started his own company, Ovitra Biotechnology, Inc. to provide ET services and technical support to cattle producers, biotech companies, and other ET firms. Ovitra offers commercial and contract ET services, embryo export, technical support,

consulting and training to beef and dairy producers, collegiate high schools, research universities and veterinary practices. He continues to speak, collaborate and publish in various areas of reproductive research, such as folliculogenesis, embryo development, ET and IVF donor stimulation and recipient evaluation. Lindsey is an active member of the American Embryo Transfer Association (as a past member of the Board of Directors and serves on their certification and research committees) and the International Embryo Technology Society (HASAC manuals and certificates and forms subcommittees) and has served as LOC for the 30th IETS Meeting in Portland, Oregon, in 2004. He and his wife Mary live in Midway, Texas, and are active in their church and community. They have two grown children, Grace Richardson and Payton Lindsey, who are both married and are graduates of Stephen F. Austin State University

Brady Hicks

Brady Hicks is the manager of Simplot Animal Sciences, where he has worked since 2002 and has led the research and production efforts and business development. His expertise is in cattle reproduction, including IVF and somatic cell nuclear transfer production systems. A major thrust of his work with the Simplot Company has been to develop large scale implementation of novel technologies into beef and dairy production systems to improve reproductive management and genetics with an end product focus. He received a BS in animal science and an MS in animal sciences with an emphasis in reproductive physiology from the University of Idaho. There his research focused on early embryonic loss and uterine gene expression in large domestic farm animals. Hicks has been married to his wife LisaAnn for 26 years and they have 5 children. When not working, he is active with his family in church and community activities and in the outdoors riding horses, hiking, hunting, and fishing.

Jon Schmidt

Dr. Jon Schmidt was raised on a grain, feedlot, and swine farm near the town of Ireton in Northwest Iowa. He received his BS in Animals Science (2000) and DVM (2004) degrees from Iowa State University. Dr. Schmidt spent many of his summers during college with Trans Ova Genetics in Sioux Center, IA assisting veterinarians and herdsmen while also managing the commercial cow-herd of Dr. David Faber, Trans Ova's president. Jon also spent a summer studying embryo sexing with PCR under Dr. Curt Youngs at Iowa State. Upon graduation, Dr. Schmidt went to work for Trans Ova as a Technical Services Veterinarian, performing in clinic and on farm embryo transfer work in Iowa and the surrounding states. He has performed embryo transfer work in 11 states. He also helped with the initial development of the company's calving program for nuclear transfer pregnancies. Since September 2006, he has served as the Director of Professional Services where he supports the company's technical teams with recruitment, training, and communication. He continues to travel and provide on farm ET services in several Midwestern states. Jon is a member of the AETA (certified), IETS, AABP, IVMA, and the local Kiwanis chapter. Dr. Schmidt, his wife, and their son currently reside in Sioux Center.

Paula Rodriguez-Villamil

Paula Rodriguez Villamil is the Global Embryo Director at Genus ABS, bringing expertise in animal genetics and reproductive technologies. Their background encompasses embryology lab direction, scientific investigation, and research management.

Prior to their current role, Paula served as Manager, Research at Genus, contributing to advancements in animal breeding. Earlier in their career, they directed the Embryology Lab at Recombinetics, focusing on animal gene editing for biomedical research and regenerative medicine. In this role, they oversaw lab operations and contributed to the development of custom gene-edited swine models.

Their experience also includes postdoctoral research at Pucrs and Universidade Federal do Ceará, demonstrating a commitment to scientific investigation. During the period at Universidade Federal do Ceará, Paula contributed to academic research initiatives. Briefly contributing as a Professor at Ingeniería Comercial UDCA, they instructed students in applied sciences. Their work history includes directing the In Vitro Laboratory at Biogen Argentina, where they managed cell culture operations within the pharmaceutical sector.

Paula's academic foundation includes a Mestrado em Ciencias Veterinarias from Universidade Federal do Rio Grande do Sul and a degree in Educacion Virtual from Universidad Nacional de Córdoba.

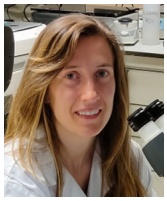
Sofia Ortega

Dr. Ortega is originally from Honduras where she completed a Bachelor of Agricultural Sciences at Zamorano Agricultural University in 2003. For the next five years she worked managing the first bull stud in Honduras owned by the Cattlemen Fund of Honduras. From 2009-2011 she completed a Master of Sciences in Animal Sciences from the Pontifical Catholic University of Chile studying Kappa-Casein genotypes and their effects in milk and cheese production in Montbeliarde-Holstein cattle. She later moved to the US and did a Ph.D. in Animal Molecular and Cellular Biology at the University of Florida from 2012-2016, focusing on the genetic control of reproduction and embryonic development in dairy cattle. In 2017, she joined The University of Missouri as a postdoctoral fellow studying mechanisms involved in pregnancy establishment in cattle using systems biology and genetic engineering approaches. She continued at the University of Missouri from 2019-2022 as an Assistant professor of Reproductive Physiology, studying male influences on pregnancy establishment. In August 2022, Dr. Ortega was recruited to the Department of Animal and Dairy Sciences at the University of Wisconsin-Madison as an Assistant Professor of Reproductive Physiology to continue with her line of research. Her program focuses on the genetic regulation of fertility with an emphasis in preimplantation embryonic development and placentation in the bovine. She uses novel genomic approaches including gene editing, to investigate the effect of reproduction-related genes on development and physiology. 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.

Riley Thompson-Brandhagen

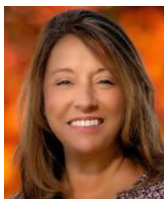
Postdoctoral research at the Animal Reproduction and Biotechnology Laboratory at Colorado Sate University included evaluating endometrial and oviductal organoids and generating extracellular vesicles from canine, feline, bovine, equine, and murine tissues as models and potential therapeutics for various diseases and to facilitate advanced reproductive technologies and contraceptive development. Current research involves developing 3D organoid cultures from the reproductive tissues of various domestic species and evaluating their secreted extracellular vesicles as models of normal physiology and pathology, as well as to develop potential therapeutics.

Priscila Ramos-Ibeas



Priscila Ramos-Ibeas obtained her Veterinary degree in 2009 (Complutense University, Madrid, Spain). Next, she obtained a Master's Degree in "Research in Veterinary Sciences" in 2010. She worked in Dr. Pedro Lorenzo´s Reproductive Physiology lab in the Complutense University in Madrid (Spain), analyzing the effect of acute fasting on follicular development in the rabbit model. She was awarded a FPI Predoctoral Fellowship from the Ministry of Science and Education (Spain), and she started her PhD in Dr. Alfonso Gutiérrez-Adán lab, in the Animal Reproduction Department in INIA, the Spanish National Institute for Research in Agriculture (Madrid, Spain). In July 2014, she defended her doctoral thesis in the Department of Animal Physiology (Complutense University, Madrid), entitled: "Effect of origin and culture conditions on the heterogeneity of pluripotent cell populations", unanimously obtaining the highest qualification (summa cum laude). The thesis was presented as a compendium of four peer-reviewed publications, all of them as first author, in the following journals: Plos ONE, Molecular Reproduction and Development, Biology of Reproduction, and Reproduction, Fertility and Development. The main objective of this thesis was to study several crucial aspects of pluripotent cell lines derivation, such as the effect of embryonic source or culture conditions, or the origin of pluripotent cells.

Janeen Salak-Johnson



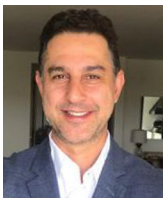
Dr. Janeen Salak-Johnson obtained her PhD from Texas Tech University and pursued a Postdoctoral Training Fellowship in Psychoneuroimmunology at the University of Minnesota, supported by NIH funding. She served as a faculty member in the Department of Animal Sciences at the University of Illinois until 2017 before transitioning to Oklahoma State University in 2018, where she was the Temple Grandin Endowed Professor in the Department of Animal and Food Sciences.

Salak-Johnson is recognized nationally and internationally as a leading stress physiology and animal welfare expert. Her research integrates basic and translational science to explore maternal-fetal interactions concerning stress physiology, the brain-gut-immune axis, and the welfare of future offspring. She actively participates in numerous national and international advisory boards and task forces as an animal care and well-being expert. With over a decade of involvement with AAALAC International, she has served as a former board of directors member and is currently engaged with the Agricultural Subcommittee and as a delegate for ASAS.

Salak-Johnson is esteemed as a foremost authority on animal welfare and has provided expert testimony in various legal matters, including California's Prop 12 and Massachusetts' Question 3, underscoring her impactful contributions to animal welfare research and industry partnerships. Recently, she authored an expert report for a lawsuit initiated by Oklahoma cattle and swine producers concerning the negative impacts of gas flares on their animals' welfare, aiding in the case's resolution. Additionally, she has been appointed to the National Pork Board's Sow Housing and Management Task Force.

She boasts a comprehensive publication history, with her research cited more than 4,550 times. Recently, she was acknowledged as one of the top 2% of researchers in her discipline. She has been invited to speak at various national and international conferences. Furthermore, she has guided over 55 graduate students and 40 undergraduate students as a research mentor/advisor. She has also been a panel and ad-hoc reviewer for the USDA and NSF. Actively engaged in the peer-review process, she reviews for numerous national and international journals and currently holds the position of academic editor for the International Journal: Animals, in addition to being a member of the Editorial Board for Frontiers in Ethology. Since 2019, she has obtained over $14 million in funding as a principal investigator, co-investigator, or mentor from the USDA and NIH.

Rodrigo Menedes Untura



Rodrigo Mendes Untura serves as the Global Strategy Account Manager at ABS Global since June 2017 and has held the position of General Manager Global and Executive Director at In Vitro Brasil since January 2009. With a professional background in veterinary medicine, Rodrigo Mendes Untura earned a degree in Veterinario, Medicina Veterinária from UNIFEOB between 1995 and 1999.

Poster Presentations

Graduate Student Competition Finalists

1 Cattle embryos undergo normal early elongation in the absence of embryonic disc
I. Flores-Borobia, A. Salvo-Jiménez, N.* Martínez *de los Reyes, L. González-Brusi, P. Ramos-Ibeas, and P. Bermejo-Álvarez, Animal Reproduction Department, INIA, CSIC, Madrid, Spain*

2 Maternal-embryo crosstalk via extracellular vesicle miRNAs during embryonic reactivation after diapause in roe deer (*Capreolus capreolus*)
G. de Ávila Ferronato[1], E. Pericuesta[1], L. Arévalo[1], P. Beltrán-Breña[1], R. Mazzarella[1], A. Álvarez-Barrientos[2], B. Fernández-Fuertes[1], and J. M. Sánchez[3], [1]Department of Animal Reproduction, National Institute for Agriculture and Food Research and Technology (INIA-CSIC), Madrid, Spain; [2]Bioscience Applied Techniques Facility, University of Extremadura, Badajoz, Spain; [3]Andalusian Institute of Agricultural and Fisheries Research and Training (IFAPA), Hinojosa del Duque, Spain*

3 Characterization and miRNA profiling of oviductal extracellular vesicles in early pregnancy in the rabbit model
J. Fernández-González[1], K. Cañon-Beltrán[2,3], Y. N. Cajas[2,4], R. F. Pérez[6], A. Vicente-Carrillo[1], D. Jordán-Rodríguez[5], P. L. Lorenzo[5], P. G. Rebollar[4], D. Rizos[2], R. M. García-García[5], and M. Arías-Álvarez[1], [1]Department of Animal Production, Veterinary Faculty, Complutense University of Madrid, Madrid, Spain; [2]Department of Animal Reproduction, National Institute for Agriculture and Food Research and Technology (CSIC-INIA), Madrid, Spain; [3]Programa de Medicina Veterinaria y Zootecnia, Grupo de investigación KYRON, Corporación Universitaria del Huila (CORHUILA), Huila, Colombia; [4]Department of Agrarian Production, Universidad Politécnica de Madrid, Ciudad Universitaria s/n, 28040, Madrid, Spain; [5]Department of Physiology, Veterinary Faculty, Complutense University of Madrid, Madrid, Spain; [6]Department of Biochemistry and Molecular Biology, Veterinary Faculty, Complutense University of Madrid, Madrid, Spain*

4 Changes in ovarian architecture are associated with advanced reproductive age in the South African cheetah
A. Heinrich[1], E. Ruggeri[2], A. Futtner[1], C. Young[2], M. Takahashi[2], B. Durrant[2], and F. Duncan[1], [1]Department of Obstetrics and Gynecology, Feinberg School of Medicine, Northwestern University, Chicago, IL, USA; [2]Beckman Center for Conservation Research, San Diego Zoo Wildlife Alliance, Escondido, CA, USA*

5 *TFAP2C* is essential for first lineage segregation and blastocyst formation in sheep
N. Martínez de los Reyes, A. Siegmund-Sabater, P. Marigorta, P. Bermejo-Álvarez, and P. Ramos-Ibeas, Animal Reproduction Department, INIA, CSIC, Spain*

6 Impact of chilling, cryopreservation, and freeze-drying on DNA fragmentation and PLCζ expression in koala (*Phascolarctos cinereus*) epididymal spermatozoa
P. D. Palacios[1], P. A. Sergura Forero[1], R. J. Gurkin[1], J. M. Smith[2], Y. Campbell[3], S. D. Johnston[1,3], and A. Gambini[1,2], [1]School of Agriculture and Food Sustainability, The University of Queensland, Gatton, Queensland, Australia; [2]School of Veterinary Science, The University of Queensland, Gatton, Queensland, Australia; [3]School of the Environment, The University of Queensland, Brisbane, Queensland, Australia*

Bioethics, Welfare, and Sustainability

7 Influence of seminal quality on embryo characteristics in the Colombian bovine Blanco Orejinegro (BON) breed
A. Mejia Gallego[1], E. Neira Rivera[2], J. F. Martinez Rocha[2], M. Cortez Escobar[2], D. L. Gomez Lopez[2], D. P. Barajas Pardo[3], J. G. Velasquez Penagos[2], L. Bonilla Leon[1], I. S. Rondon*

Barragan[4], and R. Lopera Vasquez[1], [1]Impronta Research Group, Faculty of Veterinary Medicine and Zootechnics, Universidad Cooperativa de Colombia, Ibagué, Tolima, Colombia; [2]Corporación Colombiana de Investigación Agropecuaria AGROSAVIA, Bogota, Cundinamarca, Colombia; [3]Araucos Research Group, Faculty of Veterinary Medicine and Zootechnics, Universidad Cooperativa de Colombia, Villavicencio, Meta, Colombia; [4]Immunobiology and Pathogenesis Research Group, Faculty of Veterinary Medicine and Zootechnics, Universidad del Tolima, Ibagué, Tolima, Colombia

Case Reports and Field Data

8 Use of GnRH versus P_4 as an exogenous hormonal support for corpus lutea to improve embryo transfer pregnancy rates in crossbred recipients under a tropical environment
L. Nasser[1], E. A. Bangert[2], C. U. Braz[2], R. Jimenez[1], M. E. Torres[1], and M. B. Wheeler[2], [1]Born Animal Biotechnology, Ciudad del Saber, Panama City, Panama; [2]University of Illinois Urbana–Champaign, Urbana, IL, USA*

9 Induction of follicular wave emergence in alpacas adapted to coastal conditions: A case report
L. Hidalgo-Y[1], G. Cárdenas[1], C. Arévalo[1], L. Zabarburu[1], N. Enrriquez[2], and J. Palomino[1], [1]Universidad Científica del Sur, Lima, Peru; [2]Universidad Nacional Mayor de San Marcos, Lima, Peru*

10 Machine learning analysis of real-time embryo videos predicts pregnancy outcomes in cattle
C. Wells, C. Hayden, M. Rea, K. Johansen, and R. Killingsworth, EmGenisys, Driftwood, TX, USA*

11 An evaluation of *in vitro* embryo production among 38 bovine breeds in Colombia
S. Castañeda[1], R. G. Gómez[2], M. E. Kjelland[3,4], and S. Romo[5], [1]Corporación Colombiana de Investigación Agropecuaria AGROSAVIA, Mosquera, Cundinamarca, Colombia; [2]In Vitro Colombia SAS, Florencia, Caqueta, Colombia; [3]Conservation, Genetics & Biotech LLC, Valley City, ND, USA; [4]Mayville State University, Mayville, ND, USA; [5]Facultad de Estudios Superiores Cuautitlán—UNAM, Cuautitlán, México, México*

12 Relationship between antler weight, testicular volume, and serum testosterone concentration in fallow deer (*Dama dama*) under professional care in Mexico City
M. Y. López-Gómez, Facultad de Estudios Superiores Cuautitlán, UNAM, Cuautitlán, Estado de México, México*

13 Pregnancy outcomes of synchronized recipients according to stage of *in vitro*-produced embryos from Zebu donors
M. M. Soares[1], G. P. Cadima[1], J. R. Santos[1], L. S. Fernandes[1], A. M. Sousa[1], N. S. Reis[2], and R. M. Santos[2], [1]Vale do Embrião, Uberlandia, Minas Gerais, Brazil; [2]Universidade Fereral de Uberlândia, Uberlandia, Minas Gerais, Brazil*

14 Uterine cytology for recipient selection in a commercial ICSI program in Texas
B. Manica[1], M. G. Souza[1], R. L. Beck[1], L. Mota Melo[2], and R. E. Martínez[2], [1]In Foal Inc., Millsap, TX, USA; [2]Tarleton State University, Stephenville, TX, USA*

15 Reproductive status of beef donors does not influence *in vitro* embryo production or pregnancy per embryo transfer
P. R. Cortat[1], M. Balistrieri[1], L. O. Silva[1], C. E. C. Consentini[2], D. Gaitkoski[3], M. S. Oliveira[3], A. Z. Braga[3], C. R. R. Bruner[4], and R. Sartori[1], [1]Department of Animal Science, Luiz de Queiroz College of Agriculture (ESALQ), University of São Paulo, Piracicaba, SP, Brazil; [2]Globalgen Vet Science, Jaboticabal, SP, Brazil; [3]CPEX Embriões, Mogi Mirim, SP, Brazil; [4]Tulipa Agropecuária, Campinorte, GO, Brazil*

16 ReBreed21 program for timed embryo transfer in beef cattle: Field data evaluation
M. Balistrieri[1], R. L. Stolf[1], P. R. Cortat[1], A. L. M. Lopes[1], G. B. Kolling[1], C. C. Vandresen[1], C. C. Soares[2], L. Cuppari Neto[2], S. Uvo[2], J. O. Bordin[2], and R. Sartori[1], [1]Department of Animal*

Science, Luiz de Queiroz College of Agriculture (ESALQ), University of São Paulo, Piracicaba, SP, Brazil; [2]Araquá Farm, Charqueada, SP, Brazil

17 Effects of 6-day or 7-day CO-Synch + CIDR and fixed-time artificial insemination protocols on pregnancy rates of beef heifers and cows
N. Noga, C. Looney, J. Powell, B. Littlejohn, K. Coffey, and C. Rosenkrans Jr., University of Arkansas, Fayetteville, AR, USA*

Cloning/Nuclear Transfer

18 Cloning of a Dorper stud ram: Mexico's first successful case
B. Ramos Serrano[1], R. Rangel Santos[2], J. L. Rodríguez Suastegui[3], A. Lorenzo Torres[2], A. J. Montiel Quiroga[4], and J. E. Hernández Pichardo[3], [1]Doctorado en Ciencias Biológicas y de la Salud, Universidad Autónoma Metropolitana, Ciudad de México, México; [2]Posgrado en Producción Animal, Departamento de Zootecnia, Universidad Autónoma Chapingo, Chapingo, Texcoco, Estado de México, México; [3]Departamento de Producción Agrícola y Animal, Universidad Autónoma Metropolitana-Xochimilco, Coyoacán, Ciudad de México, México; [4]Centro de Reproducción y Medicina Equina, Ajusco, Tlalpan, Ciudad de México, México*

19 Effect of resveratrol on the development of bighorn sheep clone embryos generated by ISCNT
J. R. Vazquez Avendaño[1], D. A. Ambriz García[1], J. A. Sandoval Zarate[2], and M. C. Navarro Maldonado[1], [1]Universidad Autónoma Metropolitana, Ciudad de México, México; [2]Dirección de Operación Científica y Técnica de la DGZCFS de la SEDEMA-GCDMX, Ciudad de México, México*

20 Targeted expression of eGFP on Y-chromosome in cloned buffalo blastocysts
N. I. Assad[1], S. N. Magray[1], A. Khatun[1], S. H. Yaqoob[1], A. A. Malik[1], F. A. Lone[1], N. Handoo[1], Y. F. Wani[1], M. A. Dar[1], S. Nazir[1], Z. A. Pampori[1], M. Abdullah[2], M. A. Bhat[3], S. M. Andrabi[1], and R. A. Shah[1], [1]Faculty of Veterinary Sciences and Animal Husbandry, Shuhama, SKUAST Kashmir, Srinagar, Jammu and Kashmir, India; [2]Mountain Research Centre for Sheep and Goats, Shuhama, SKUAST Kashmir, Srinagar, Jammu and Kashmir, India; [3]Faculty of Agriculture, Wadura, SKUAST Kashmir, Srinagar, Jammu and Kashmir, India*

Companion CANDES

21 Morphological evaluation, *in vitro* maturation, and embryo production from oocytes of single individuals of kodkod (*Leopardus guigna*) and puma (*Puma concolor*): A case report
A. Cáceres[1], D. Toledo-Saldivia[2], F. O. Castro[3], L. Rodriguez-Alvarez[3], and D. Veraguas-Dávila[1], [1]Departamento de Ciencia Animal, Facultad de Ciencias Veterinarias y Pecuarias, Universidad de Chile, Santiago, Región Metropolitana, Chile; [2]Escuela de Medicina Veterinaria, Facultad de Ciencias de la Vida, Universidad Andrés Bello, Viña del Mar, Región de Valparaíso, Chile; [3]Departamento de Ciencia Animal, Facultad de Ciencias Veterinarias, Universidad de Concepción, Chillán, Región de Ñuble, Chile*

22 The hermaphroditic staghorn coral (*Acropora cervicornis*) in the Florida Keys does not self-fertilize after oocyte-sperm bundle breakdown
L. M. Penfold[1], A. Neufeld[1,2], J. D. Gillis[1], and M. L. Gragg[1,3], [1]South-East Zoo Alliance for Reproduction & Conservation, Yulee, FL, USA; [2]Coral Restoration Foundation, Tavernier, FL, USA; [3]University of Florida, Gainesville, FL, USA*

23 Updates on the reproductive physiology of two xenarthran species: The southern tamandua (*Tamandua tetradactyla*) and the two-toed sloth (*Choloepus didactylus*)
L. Fallon[1], R. Felton[1], C. Lusardi[2], M. Belmer[2], A. Decracker[1], S. Hunjan[1], M. Marinkovich[1], B. Durrant[1], and C. Tubbs[1], [1]Conservation Science Wildlife Health, San Diego Zoo Wildlife Alliance, Escondido, CA, USA; [2]Wildlife Care, San Diego Zoo Wildlife Alliance, San Diego, CA, USA*

24 Functional miRNA signatures in follicular fluid extracellular vesicles and granulosa cells associated with oocyte maturation in the southern white rhinoceros (*Ceratotherium simum simum*)
E. Ruggeri[*1], *A. Gad*[2], *K. Klohonatz*[3], *N. Menjivar*[4], *B. Durrant*[1], *and D. Tesfaye*[2], [1]*San Diego Zoo Wildlife Alliance, Beckman Center for Conservation Research, Escondido, CA, USA;* [2]*Colorado State University, Animal Reproduction and Biotechnology Laboratory, Fort Collins, CO, USA;* [3]*University of Pennsylvania, Center for Research on Reproduction and Women's Health, Philadelphia, PA, USA;* [4]*Stanford Fertility and Reproductive Health Services, Stanford Medicine Children's Health, Sunnyvale, CA, USA*

25 Successful cryopreservation of giant pink sea star (*Pisaster brevispinus*) larvae
C. Young[*1], *J. Wojtusik*[2], *A. Lawlor*[3], *A. Kidd*[4], *A. Kim*[4], *B. Durrant*[1], *and N. Ravida*[1], [1]*San Diego Zoo Wildlife Alliance, Escondido, CA, USA;* [2]*Omaha's Henry Doorly Zoo and Aquarium, Omaha, NE, USA;* [3]*Aquarium of the Pacific, Long Beach, CA, USA;* [4]*Sunflower Star Laboratory, Moss Landing, CA, USA*

26 Effects of urine and saltwater contamination on the post-thaw survival of bottlenose dolphin (*Tursiops truncatus*) spermatozoa
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27 Investigating intrinsic variation in motility of fertile canine semen using repeatability analysis
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28 Evaluation and cryopreservation of gametes from the common opossum, *Didelphis marsupialis*, as a model for the conservation of genetic material of American marsupials
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29 Evaluation of two different media for organotypic *in vitro* culture of cryopreserved testicular tissues from adult *Pecari tajacu*
T. M. Matos[1], *A. M. Silva*[1], *L. G. P. Bezerra*[1], *G. S. C. Bezerra*[1], *L. L. Dantas*[1], *A. F. Pereira*[2], *P. Comizzoli*[3], *and A. R. Silva*[*1], [1]*Laboratory of Animal Germplasm Conservation—LCGA, UFERSA, Mossoró, RN, Brazil;* [2]*Laboratory of Animal Biotechnology—LBA, UFERSA, Mossoró, RN, Brazil;* [3]*Smithsonian's National Zoo and Conservation Biology Institute, Washington, DC, USA*

31 Effect of follicular fluid–derived extracellular vesicles from a young mare on equine oocyte maturation and embryo development *in vitro*
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Cryopreservation/Cryobiology

32 Efficacy of a chemically defined vitrification medium in combination with the KVS direct transfer system for the cryopreservation of bovine embryos
K. Momozawa[*], *H. Nabenishi, and M. Nagano, School of Veterinary Medicine, Kitasato University, Towada, Aomori, Japan*

33 *In vitro* fertilizing ability of cryopreserved goat sperm from the endangered Catalan breed Cabra Blanca de Rasquera using heterologous IVF with cattle oocytes
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34 Influence of seminal plasma extracellular vesicles addition to cryopreserved sperm of equine
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35 Brief exposure to polyglycerol-functionalized graphene oxide during vitrification reduces fertilization and developmental outcomes in immature bovine cumulus-oocyte complexes
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36 Exploration of the cryoprotective properties of carboxylated poly-L-lysine for vitrification of IVM bovine oocytes
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37 Effect of *Moringa oleifera* leaf extracts supplementation in Tris-egg yolk semen extender on bull sperm fertilizing ability *in vitro*
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38 Supplementing conventional slow freezing or vitrification media with recombinant heat shock protein HSPA1A increases the cryoresistance of dog epididymal spermatozoa
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39 Idebenone enhances cryosurvival of ram sperm after conventional slow freezing but impairs quality following kinetic vitrification
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40 Assessment of the cryosurvival of Spanish horse spermatozoa cryopreserved by microdroplets and straw vitrification techniques
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41 *In vitro* production of alpaca blastocysts using vitrified oocytes and epididymal spermatozoa
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42 Kinematic evaluation of equine epididymal spermatozoa recovered from testes stored at 4°C for different intervals and their functional response to cryopreservation
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43 L-Carnitine improves feline ovarian tissue cryopreservation
N. O. Rocha, R. F. Braga, L. F. L. Correia, G. R. Leal, and J. M. G. Souza-Fabjan, Universidade Federal Fluminense, Brazil*

44 Effect of cryopreservation protocol and tissue size on morphology of preantral follicles and proliferation activity of granulosa cells in bovine ovarian cortex
P. Romero[1], A. López[1], A. García[1], S. Carrocera[1], T. Iglesias[2], P. Nieto[1], M. Muñoz[1], and C. Díez[1], [1]Área de Genética y Reproducción, SERIDA, Centro de Biotecnología Animal, Gijón, Asturias, Spain; [2]Scientific-Technical Services, University of Oviedo, Asturias, Spain*

45 Post-thaw nanoparticle sorting of bull sperm improves cryopreservation outcomes
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46 Effects of extender type on post-thaw yak semen motility and morphology
T. Purvis[1,2], P. Harrelson[3], P. Prater[3], S. Zoca[4], L. Strickland[4], L. Anderson[2], J. Lebrun[3], G. Dike,[5] A. Ealy[1], and J. Lehmkuhler[2], [1]Virginia Tech, Blacksburg, VA, USA; [2]University of Kentucky, Lexington, KY, USA; [3]Morehead State University, Morehead, KY, USA; [4]University of Tennessee, Knoxville, TN, USA; [5]US Yaks, Wellington, KY, USA*

47 Assessment of fertilization outcomes in postwarming vitrified cattle oocytes in different media
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48 Comparative study of post-thawing epididymal and ejaculated sperm for *in vitro* fertilization of porcine oocytes
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49 The microtubule stabilizer ixabepilone improves embryonic survival after vitrification of bovine blastocysts
X. Vargas-Menéndez[1,2], J. Block[3], E. Estrada-Cortés[1,2], H. Álvarez-Gallardo[4], H. Ramíez-Vega[1], D. Heredia-Nava[1], and V. Gómez-Rodríguez[1], [1]Doctorado en Biociencias, Centro Universitario de los Altos, Universidad de Guadalajara, Tepatitlán de Morelos, Jalisco, México; [2]Laboratorio de Reproducción Animal, Campo Experimental Centro-Altos de Jalisco, Instituto Nacional de Investigaciones Forestales Agrícolas y Pecuarias (INIFAP), Tepatitlán de Morelos, Jalisco, México; [3]Department of Animal Science, University of Wyoming, Laramie, WY, USA; [4]Centro Nacional de Recursos Genéticos (CNRG), INIFAP, Tepatitlán de Morelos, Jalisco, México*

50 Impact of preservation media on equine sperm integrity and PLCζ localization following freeze-drying
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Early Pregnancy

51 Prolonged anti-luteolytic effects of a novel microencapsulated formulation of bovine recombinant interferon-tau (brIFNT) incorporated into a stable hydrogel matrix

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52 Effect of semen type on embryo development and pregnancy establishment after timed artificial insemination or fresh embryo transfer in multiparous Holstein cows

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53 Agewise evaluation of anti-Müllerian hormone (AMH) as a predictor of follicular reserve in zebu and their crossbreds

P. Sharma[*2], *K. Hadiya*[2], *S. S. Layek*[1], *S. P. Patil*[1], *K. B. Raval*[1], *S. Doultani*[3], *K. Karuppanasamy*[1], *and B. N. Saripadiya*[2], [1]*National Dairy Development Board, Anand, Gujarat, India;* [2]*College of Veterinary Sciences and Animal Husbandry, Kamdhenu University, Anand, Gujarat, India;* [3]*Department of Zoology, Biomedical Technology, Human Genetics and Wildlife Biology and Conservation, Navrangpura, Ahmedabad, Gujarat, India*

54 Sire fertility affects early pregnancy success but not the incidence of pregnancy loss

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Embryo Culture

55 Comparative transcriptomic analysis of bovine embryos developed *in vivo* and *in vitro* under group and individual culture

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56 Effects of extracellular vesicles from follicular fluid on the regulation of lipid metabolism in bovine oocytes and embryos during *in vitro* maturation

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57 Effect of embryo culture medium on *in vitro*, fetal, and postnatal development in mice
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58 Identification of the developmental kinetics involved in the fertility of bovine OPU-IVP embryos
F. Magata[1,3], H. Tsukahara[2], K. Hazano[2], R. Obinata[2], A. Yoshida[3], K. Kariya[3], A. Shirasawa[2], and M. Tani[2], [1]Obihiro University of Agriculture and Veterinary Medicine, Obihiro, Hokkaido, Japan; [2]Embryo Transfer Center, Zen-noh, Kamishihoro, Hokkaido, Japan; [3]The University of Tokyo, Bunkyo-ku, Tokyo, Japan*

59 Post-thaw developmental dynamics of IVF and conventional bovine embryos
J. Gibbons and J. Looman, School of Veterinary Medicine, Texas Tech University, Amarillo, TX, USA*

60 Fetal bovine serum supplementation enhances developmental competence and viability during extended *in vitro* culture of porcine blastocysts
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61 Cytokine profile in bovine follicular fluid: Association with oocyte developmental competence
R. Esposito[1], F. Piscopo[1], L. Masiello[1], C. Del Prete[1], M. A. Kosior[1], M. Hoelker[2], and B. Gasparrini[1], [1]Dipartimento di Medicina Veterinaria e Produzioni Animali, Università degli Studi di Napoli Federico II, Naples, Italy; [2]Department of Animal Science, Biotechnology and Reproduction of farm animals, University of Goettingen, Goettingen, Germany*

62 Acetate enhances zygotic genome activation and blastocyst development in porcine IVF embryos
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63 Effects of post-thaw exposure to ethylene glycol on bovine embryo stage and grade
J. Looman, L. Ochoa, and J. Gibbons, Texas Tech School of Veterinary Medicine, Amarillo, TX, USA*

64 Alterations in bovine COC due to LPS and/or *Lactobacillus*-conditioned medium supplementation during IVM are not transferred to the resulting embryos
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65 miR-133b influences bovine early embryogenesis through targeted gene regulation
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66 Comparison of two Percoll gradients for selection of frozen-thawed semen for *in vitro* production of bovine embryos
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67 Comparison of egg yolk and soybean lecithin in frozen semen on the *in vitro* production of bovine embryos

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68 Impact of heat stress during maturation on morphokinetics of bovine preimplantation embryos

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69 Peroxisome proliferator-activated receptor delta-PPARδ agonist (L-165041) decreases oxidative stress, increases blastocyst rate in bovine embryo

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70 MiRNA delivery during *in vitro* embryo culture regulates key genes in Rap1 and pluripotency-related signaling pathways

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71 *In vitro* embryo production using yeast extract to replace fetal calf serum: Effects on embryo quality and pregnancy rates

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72 Isolation method-dependent effects of follicular fluid extracellular vesicles on bovine oocyte maturation and embryo quality

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73 Effect of limiting antioxidant-related amino acids on redox status and early embryo development *in vitro*

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74 Proteomic and functional analysis of extracellular vesicles from *in vitro* bovine blastocysts reveals IFN-t-independent mechanisms of embryo-maternal communication

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75 MiRNA expression profiles in extracellular vesicles from *in vitro*–produced bovine embryos reveal stage-specific roles in embryo–maternal communication

I. Martinez-Hormaza[1], Y. S. Wong[1], M. A. Gutiérrez-Reinoso[1,2], D. Camaaño[1], C. Aguilera[1], J. Cabezas[3], F. O. Castro[1], and L. Rodriguez-Álvarez[1], [1]Laboratory of Animal Biotechnology, Department of Animal Science, Faculty of Veterinary Sciences, Universidad de Concepción, Chillán, Ñuble, Chile; [2]Faculty of Agricultural Sciences and Natural Resources, Technical University of Cotopaxi, Latacunga, Ecuador; [3]School of Veterinary Medicine, San Sebastián University, Concepción, Bio Bio, Chile*

76 Effect of fertilization time on *in vitro* production of bison embryos

S. X. Yang, E. Bletsky, J. Singh, and G. P. Adams, Veterinary Biomedical Sciences, Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada*

77 Effects of the mitochondria-targeted antioxidant SkQ1 during *in vitro* maturation on porcine oocyte quality and embryo development

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78 Effect of pre-IVM oocyte holding on developmental morphokinetics of equine ICSI embryos

M. Scaglia, M. Barandalla, S. Colleoni, C. Galli, and G. Lazzari, Avantea, Cremona, Italy*

79 Effects of serum and commercial serum-free medium on development of *in vitro*-produced (IVP) embryos in cattle

K. Miller, J. Hanson, T. Patrick, Y. Liu, A. Thomas, I. V. Perisse, R. Stott, C. Marriott, R. Blocher, V. Trowbridge, I. A. Polejaeva, and K. L. White, Utah State University, Logan, UT, USA*

80 Embryo splitting at the 8-cell and morula stages following zona pellucida removal does not affect bovine blastocyst development

O. Calderon and E. Mellisho, Centro de Investigación en Tecnología de Embriones, Universidad Nacional Agraria la Molina, Lima, Peru*

81 Interruption of interleukin-6 receptor (IL6R) activity reduces bovine blastocyst development and cellular composition

A. B. Pollock, M. A. Oliver, H. C. O'Neill, and A. D. Ealy, Virginia Tech, Blacksburg, VA, USA*

82 Optimizing embryo culture conditions in bovine *in vitro* embryo production: Assessing the effect of fetal bovine serum in an in-house-developed media suite

S. Doultani[1,2], S. S. Layek[1], K. B. Raval[1], S. P. Patil[1], K. Karuppanasamy[1], R. Sudharson[3], and L. B. George[2], [1]National Dairy Development Board, Anand, Gujarat, India; [2]Department of Zoology, Biomedical Technology, Human Genetics and Wildlife Biology and Conservation, Gujarat University, Navrangpura, Ahmedabad, Gujarat, India; [3]NDDB Dairy Services, NDDB House, Safdarjung Enclave, New Delhi, Southwest Delhi, Delhi, India*

83 Effect of nicotinamide mononucleotide supplementation during *in vitro* maturation on embryonic development of heat-stressed bovine oocytes

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84 Paternal influence on bovine embryo morphokinetics: Insights from time-lapse analysis of high- and low-fertility bulls
H. E. Braun and J. P. Barfield, Colorado State University, Fort Collins, CO, USA*

Embryo Manipulation

85 Effect of zygotic ablation of progesterone receptor membrane component-1 on development and differentiation of bovine embryos produced *in vitro*
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86 CRISPR/Cas9-mediated generation of transgenic goat embryos carrying human erythropoietin gene for potential therapeutic applications in humans
D. Sethi[1], A. Thakur[1], A. Kumar[1], S. K. Sahani[1], S. Chopra[1], P. Kumar[1], P. Pilania[1], S. Kumar[1], S. Kumar[1], H. N. Malik[2], and D. Malakar[1], [1]Animal Biotechnology Centre, National Dairy Research Institute, Karnal, Haryana, India; [2]UMKC School of Medicine, University of Missouri, Kansas City, MO, USA*

87 Effect of cytoplasmic maturation and CPEB1 mRNA injection on DNA methylation patterns in bovine IVF embryos
V. Trowbridge, R. Blocher, T. Patrick, I. V. Perisse, C. Marriott, Y. Mustafa, K. Miller, I. Polejaeva, and Y. Liu, Utah State University, Logan, UT, USA*

88 Successful nanoparticle-mediated delivery of transgenes and ribonucleoproteins to the preimplantation bovine embryo
V. A. Rubio-Santillanes[1], M. S. McGraw[1], B. N. Davenport[3], J. de Agostini Losano[1], M. S. Siddique[1], H. N. Jones[3], and B. W. Daigneault[1,2], [1]Department of Animal Sciences, University of Florida, Gainesville, FL, USA; [2]Department of Large Animal and Clinical Sciences, Gainesville, FL, USA; [3]Department of Physiology and Aging, University of Florida, Gainesville, FL, USA*

89 CRISPR/Cas9-based editing of the prostaglandin F synthase in endometrial epithelial cells and embryos in mice
P. Devi[1], S. Saini[1], A. Kumar[1], S. Chopra[1], D. Sethi[1], S. Kumar Sahani[1], P. Kumar[1], S. Kumar[1], S. Sumar[1], H. N. Malik[2], and D. Malakar[1], [1]Animal Biotechnology Centre, National Dairy Research Institute, Karnal, Haryana, India; [2]UMKC School of Medicine, University of Missouri, Kansas City, MO, USA*

Embryo Transfer

90 Forever chemical: Industrial contaminant detection across US bovine embryos
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91 Forever chemical: Industrial contaminant detection between *in vitro*- and *in vivo*-produced embryos
L. Zimmerman[1], A. T. De Oliveira[1], M. Rubessa[1], A. Ulanov[1], B. Scott[2], and M. B. Wheeler[1], [1]University of Illinois, Urbana–Champaign, Urbana, IL, USA; [2]Smart Reproduction, Jonesboro, AR, USA*

92 Strategy to improve pregnancy rates with *in vitro*-produced embryos in the tropics
R. De Armas and E. E. Arauz, Animal Science Department, Faculty of Agricultural Sciences, Universidad de Panamá, David, Chiriquí, Panamá*

93 Laparoscopic embryo transfer in swine: A novel and effective alternative to traditional open surgery
H. Baldassarre, L. Currin, M. Priotto de Macedo, V. Guay, F. Facioli, R. Duffy, A. Ojeiro, L. Socransky, Z. da Silva, K. Gutierrez, W. Glanzner, and V. Bordignon, McGill University, Ste. Anne de Bellevue, Quebec, Canada*

94 Improving bovine embryo transfer outcomes through precise alignment of embryo development with recipient estrous cycles
E. A. Bangert[*1], B. R. Lindsey[2], M. Rubessa[1], J. K. Newman[1], L. M. Naves[1], P. V. Marchioretto[1], and M. B. Wheeler[1], [1]University of Illinois Urbana–Champaign, Urbana, IL, USA; [2]Ovitra Biotechnology, Midway, TX, USA*

95 Perinatal and preweaning outcomes in calves born to high-producing dairy cows following artificial insemination or embryo transfer with *in vitro*-produced embryos
I. Cuevas Gómez[1], J. Jiménez Bejarano[2], P. Beltrán Breña[1], J. Lozano[3], A. I. de Prado Taranilla[2], D. Rizos[1], and J. M. Sánchez[4], [1]Department of Animal Reproduction, National Institute for Agricultural and Food Research and Technology (INIA-CSIC), Madrid, Spain; [2]Calier S.A., Barcelona, Spain; [3]Las Rozuelas del Valle S.L., Torrecampo, Córdoba, Spain; [4]Andalusian Institute of Agricultural and Fisheries Research and Training (IFAPA), Hinojosa del Duque, Córdoba, Spain*

96 Using recombinant FSH to enhance *in vitro* embryo production efficiency in *Bos indicus* donors
A. C. dos Santos Oliveira[1], C. Martins[2], E. Almeida Gricio[1], A. Souza[3], F. Randi[3], A. V. Gretter[*1], and P. Sampaio Baruselli[1], [1]Department of Animal Reproduction, University of São Paulo, São Paulo, SP, Brazil; [2]Fertiliza Fertilização In Vitro, Cuiabá, MT, Brazil; [3]Ceva Saúde Animal, Paulínia, SP, Brazil*

97 Smart surveillance: Estrus detection in Indian dairy cattle and buffaloes using AI/ML-based indigenous neck tags
M. Patre[2], S. P. Patil[*1], S. S. Layek[1], M. T. Panchal[2], N. P. Sarvaiya[2], and K. Karuppanasamy[1], [1]National Dairy Development Board, Anand, Gujarat, India; [2]College of Veterinary Sciences and Animal Husbandry, Kamdhenu University, Anand, Gujarat, India*

98 Using recombinant eCG to enhance *in vitro* embryo production efficiency in pregnant Holstein heifer donors
A. V. Gretter[*1], T. Carneiro[2], S. Albertini[1], A. Souza[3], F. Randi[3], and P. Sampaio Baruselli[1], [1]Department of Animal Reproduction, University of São Paulo, São Paulo, SP, Brazil; [2]Fazenda Bela Vista, Tapiratiba, SP, Brazil; [3]Ceva Saúde Animal, Paulínia, SP, Brazil*

99 Superovulation in Dorper sheep donor: Comparing the effectiveness of a single dose of recombinant FSH versus conventional multiple doses
W. Braga[1], A. V. Gretter[*2], S. Albertini[2], E. Almeida Gricio[2], V. Guidi Zardo[2], F. Randi[3], A. Souza[3], and P. Sampaio Baruselli[2], [1]Grupo Master Genética, São Paulo, SP, Brazil; [2]Department of Animal Reproduction, University of São Paulo, São Paulo, SP, Brazil; [3]Ceva Saúde Animal, Paulínia, SP, Brazil*

100 Induction of puberty prior to the synchronization of estrus in *Bos indicus* (crossbred Gyr) heifers transferred with *in vitro*-produced embryos
A. V. Cedeno[*1,2], L. Loor[1], V. Meza[1], J. Garzon[1], and G. Bó[2,3], [1]IRAE, Instituto de Reproducción Animal Ecuador, Guayaquil, Ecuador; [2]UNVM, Instituto A.P. de Ciencias Básicas y Aplicadas, Universidad Nacional de Villa María, Córdoba, Argentina; [3]IRAC, Instituto de Reproducción Animal Córdoba (IRAC), Córdoba, Argentina*

Epidemiology/Diseases

102 Spatial localization of avian and human influenza A virus receptors in male and female bovine reproductive tissues
B. Poliakiwski[*1], T. Minela[1], D. Smith[1], Z. Seekford[1], J. Cain[2], O. Polanco[1], G. Johnson[2], P. Ross[3], K. Dimitrov[4], C. Lamb[1,5], and K. Pohler[1], [1]Department of Animal Science, College of Agriculture and Life Sciences, Texas A&M University, College Station, TX, USA; [2]Department of Veterinary Integrative Biosciences, School of Veterinary Medicine and Biomedical Sciences, Texas A&M University, College Station, TX, USA; [3]ST Genetics, Navasota, TX, USA; [4]Texas A&M Veterinary Medical Diagnostic Laboratory, College Station, TX, USA; [5]Texas A&M AgriLife Research, College Station, TX, USA*

Fertilization/ICSI/Activation

103 A new sperm preparation improves blastocyst development in bovine IVF
O. Briski[1], F. Fagali Franchi[2], E. Piga[1], F. Franciosi[2], C. Baro Graf[1], M. G. Buffone[1], M. Gomez Elias[1], V. Lodde[2], A. M. Luciano[2], and D. Krapf[1], [1]Embreed Lab, Rosario, Santa Fe, Argentina; [2]Reproductive and Developmental Biology Laboratory, Department of Veterinary Medicine and Animal Sciences, University of Milan, Milan, Italy*

104 Comparative analysis of semen separation methods for *in vitro* fertilization in goats
A. T. De Oliveria[1], C. Braz[1], L. Zimmerman[1], K. Stewart[1], B. Scott[2], and M. B. Wheeler[1], [1]University of Illinois Urbana–Champaign, Urbana, IL, USA; [2]Smart Reproduction, Jonesboro, AR, USA*

105 TLR2 activation in Japanese Black nonsexed and Y-sorted sperm improves crossbred embryo development *in vitro*
A. Miyamoto[1], T. Hashimoto[1], R. Uchiyama[1], K. Kusama[2], K. Imakawa[3], M. Shimada[4], and I. Akthar[1], [1]Global Agromedicine Research Center (GAMRC), Obihiro University of Agriculture and Veterinary Medicine, Obihiro, Japan; [2]Department of Endocrine Pharmacology, Tokyo University of Pharmacy and Life Sciences, Tokyo, Japan; [3]Research Institute of Agriculture, Tokai University, Kumamoto, Japan; [4]Graduate School of Integrated Sciences for Life, Hiroshima University, Higashi-Hiroshima, Japan*

106 TRPV3 channels are functionally expressed in domestic cat oocytes (*Felis catus*)
I. Carvacho[1], S. Vergara[1], C. Suárez-Suárez[1,2], J. Duarte[1,2], F. Hinostroza[1,3], M. Piesche[4], R. A. Fissore[5], and D. Veraguas[6], [1]Laboratorio de Canales Iónicos y Reproducción, Departamento de Medicina Traslacional, Facultad de Medicina, Universidad Católica del Maule, Talca, Chile; [2]Escuela de Ingeniería en Biotecnología, Facultad de Ciencias Agrarias y Forestales, Universidad Católica del Maule, Talca, Chile; [3]Centro de Investigación de Estudios Avanzados del Maule, CIEAM, Vicerrectoría de Investigación y Postgrado, Universidad Católica del Maule, Talca, Chile; [4]Departamento de Ciencias Preclínicas, Facultad de Medicina, Universidad Católica del Maule, Talca, Chile; [5]Department of Veterinary and Animal Sciences, University of Massachusetts Amherst, Amherst, MA, USA; [6]Departamento de Ciencia Animal, Facultad de Ciencias Veterinarias y Pecuarias, Universidad de Chile, Santiago, Chile*

107 Evaluation of different sperm selection methods on the viability and functional integrity of frozen/thawed equine sperm prepared for *in vitro* fertilization
J. A. Savoie, A. R. Alvarado, S. A. Aguirre, and F. A. Diaz, Louisiana State University Agricultural Center, Baton Rouge, LA, USA*

108 Exposure of *in vitro*-matured cat oocytes to zinc chelation supports parthenogenetic embryo development to the blastocyst stage
A. Gambini[1,2], P. Lee[3], Y. Yang[3], and P. Comizzoli[3], [1]School of Agriculture and Food Sustainability, The University of Queensland, Brisbane, Queensland, Australia; [2]School of Veterinary Science, The University of Queensland, Brisbane, Queensland, Australia; [3]Smithsonian's National Zoo and Conservation Biology Institute, Washington, DC, USA*

109 Metabolomic profiling of bull seminal plasma: Implications for IVF success
A. Viljaste-Seera, E. Tsopp, M. Nõmm, P. Pärn, and Ü. Jaakma, Estonian University of Life Sciences, Tartu, Tartumaa, Estonia*

110 Storage of frozen-thawed equine sperm for 72 hours at 4°C, 22°C, and 37°C using two sperm processing protocols and evaluated by flow cytometry and computer-assisted sperm analysis
S. A. Aguirre and F. A. Diaz, Louisiana State University Agricultural Center, Baton Rouge, LA, USA*

111 The effect of oxygen tension on *in vitro* maturation and fertilization of swine oocytes
L. G. Currin, H. Baldassarre, Z. Da Silva, M. Priotto de Macedo, F. Facioli, W. G. Glanzner, K. Gutierrez, V. Guay, and V. Bordignon, McGill University, Ste. Anne de Bellevue, Quebec, Canada*

113 Effect of follicular fluid, FSH, and progesterone on motility, plasma membrane quality, and mitochondrial activity of stallion sperm preincubated for IVF
R. Gonzalez-Castro, C. Porfldt, A. Ash, and E. Carnevale, Colorado State University, Fort Collins, CO, USA*

114 Development potential of domestic cat oocytes stored at room temperature for 18 hours before *in vitro* fertilization
V. Medina[1], S. Cousseau[1], F. Diaz[1], A. Johnson[2], K. Bondioli[1], M. Mitchell[1], and C. Pinto[3], [1]Louisiana State University, Baton Rouge, LA, USA; [2]Auburn University, Auburn, AL, USA; [3]Tufts University, Woodstock, CT, USA*

Folliculogenesis/Oogenesis

115 Heat stress alters the miRNA cargo of preovulatory follicular fluid extracellular vesicles and reduces fertility in dairy cattle
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116 Lipid profile of bovine oocytes: Development throughout the ovarian cycle
F. A. M. Oliveira[1], P. M. C. Soares[2], G. R. Paula[2], A. C. Santos[3], C. B. Costa[2], A. K. Souza[2], A. F. Zangirolamo[2], F. A. Melo-Sterza[4], C. R. Ferreira[5], and M. M. Seneda[2], [1]Instituto Federal de Educação, Ciência e Tecnologia do Amazonas, Tabatinga, Amazonas, Brazil; [2]Universidade Estadual de Londrina, Londrina, Paraná, Brazil; [3]Universidade Federal de São Carlos, São Carlos, São Paulo, Brazil; [4]Universidade Estadual de Mato Grosso do Sul, Aquidauana, Mato Grosso do Sul, Brazil; [5]Purdue University, West Lafayette, IN, USA*

117 The study of the transcriptomic and functional profile of bovine oocytes throughout the ovarian cycle
F. A. M. Oliveira[1,2], P. M. C. Soares[2], G. R. Paula[2], A. C. Santos[3], M. B. Souza-Caceres[3], A. F. Zangirolamo[3], A. K. Souza[2], F. A. Melo-Sterza[4], M. R. Chiaratti[3], and M. M. Seneda[2], [1]IFAM, Tabatinga, Amazonia, Brazil; [2]Universidade Estadual de Londrina, Londrina, Parana, Brazil; [3]Universidade Federal de Sao Carlos, Sao Carlos, Sao Paulo, Brazil; [4]UEMS, Aquidauana, MS, Brazil*

118 Association of catecholaminergic innervation and ovarian follicles in cattle
R. A. Carrasco[1], C. E. P. Leonardi[2], J. Singh[1], and G. P. A. Adams[1], [1]Department of Veterinary Biomedical Sciences, University of Saskatchewan, Saskatoon, Saskatchewan, Canada; [2]Department of Large Animal Clinics, Universidade Federal de Santa Maria, Santa Maria, Rio Grande do Sul, Brazil*

120 Evaluation of mechanical isolation techniques for efficient harvesting of bovine preantral follicles
K. A. Hyde[1], A. N. P. Morais[1,2], A. L. Conceição-Santos[1,2], L. Engelman[1], M. O. Gastal[1], J. B. Graceli[1,3], A. C. Denicol[4], and E. L. Gastal[1], [1]Animal Science, School of Agricultural Sciences, Southern Illinois University, Carbondale, IL, USA; [2]Laboratory of Manipulation of Oocytes and Preantral Follicles, Faculty of Veterinary Medicine, State University of Ceará, Fortaleza, Ceará, Brazil; [3]Laboratory of Cellular Toxicology and Endocrinology, Department of Morphology, Federal University of Espírito Santo, Vitoria, Espírito Santo, Brazil; [4]Department of Animal Science, University of California Davis, Davis, CA, USA*

Genetic Engineering

121 CRISPR-Cas9–mediated β-lactoglobulin gene-editing in goat skin fibroblasts for somatic cell nuclear transfer
M. Singh, A. Moawad, and X. Ma, Fort Valley State University, Fort Valley, GA, USA*

122 Beef donor age and embryo quality affect aneuploidy frequency in IVP bovine embryos
D. Le Bourhis[*1], *V. Costes*[1], *M. C. Deloche*[1], *A. Bonnet*[1], *A. Bonnet-Garnier*[2], *D. Boichard*[3], *and C. Escouflaire*[1], [1]*ELIANCE, Paris, France;* [2]*Université Paris-Saclay, INRAE, BREED, UVSQ, Jouy en Josas, France;* [3]*Université Paris-Saclay, INRAE, AgroParisTech, GABI, Jouy en Josas, France*

123 Optimization of CRISPR-Cas9 RNP electroporation in bovine zygotes from overnight-stored ovaries
C. Benedetti[*1], *M. Rahimi*[1], *M. Schreiber*[1], *H. Habermann*[1], *L. Haake*[1], *D. Miskel*[2], *D. Tesfaye*[3], *B. Brenig*[4], *E. Held-Hoelker*[1,2], *and H. Hoelker*[1], [1]*Department of Animal Science, Biotechnology and Reproduction of farm animals, Georg-August University Göttingen, Göttingen, Germany;* [2]*Institute of Animal Sciences, Animal Breeding, University of Bonn, Bonn, Germany;* [3]*Department of Biomedical Sciences, Animal Reproduction and Biotechnology Laboratory, Colorado State University, Fort Collins, CO, USA;* [4]*Department of Molecular Biology of Livestock, Georg-August University Göttingen, Göttingen, Germany*

124 CRISPR electroporation of bovine zygotes for beta-lactoglobulin gene editing: Embryo viability following handmade biopsy and impact on gene analysis
C. D. Vieira[1], *H. P. Pereira*[2], *E. D. Souza*[2], *L. C. Brandt Jesus*[1], *N. Z. Saraiva*[2], *C. S. Oliveira*[2], *and L. S. A. Camargo*[*2], [1]*Federal University of Juiz de Fora, Juiz de Fora, Minas Gerais, Brazil;* [2]*Embrapa Dairy Cattle, Juiz de Fora, Minas Gerais, Brazil*

125 Sequential CRISPR/Cas9 editing enhances generation of triple knockout porcine fibroblasts for xenotransplantation
M. Navarro[*1,2], *C. Alvarez*[2], *M.* Perez *Pepe*[2], *B. E. Devia*[2], *Y. Sezgin*[3], *G. Snyder*[3], *A. Abalovich*[2], *M.* Naeimi *Kararoudi*[3], *and A. Mutto*[1,2], [1]*Laboratorio de Biotecnologías Aplicadas a la Reproducción Animal, Instituto de Investigaciones Biotecnológicas "Dr. Rodolfo Ugalde," Buenos Aires, Argentina;* [2]*CrofaBiotech SA, Buenos Aires, Argentina;* [3]*Center for Childhood Cancer and Blood Disease, Abigail Wexner Research Institute, Nationwide Children's Hospital, Columbus, OH, USA*

126 Optimization of CRISPR-HDR electroporation delivery in pig embryos to generate *Escherichia coli* resistance
S. Lobo and E. A. Maga, University of California–Davis, Davis, CA, USA*

127 Targeted RUNX2 repression via dCas9-KRAB restores matrix homeostasis in inflamed murine primary chondrocytes
S. Park[*1], *E. Kim*[1], *S. Lee*[1], *S. Lee*[2], *H. Park*[3], *and Y. Jeon*[2], [1]*Department of Theriogenology and Reproductive Biotechnology, College of Veterinary Medicine, Jeonbuk National University, Iksan, Jeonbuk, Republic of Korea;* [2]*Laboratory of Theriogenology, College of Veterinary Medicine, Chungnam National University, Daejeon, Daejeon, Republic of Korea;* [3]*Laboratory of Molecular Genetics, College of Pharmacy, Chungbuk National University, Cheongju, Chungbuk, Republic of Korea*

Male Physiology

129 Effect of a 60-day supplementation with a commercial antioxidant on stallion sperm morphology
C. Del Prete, V. Longobardi, A. Vastolo, F. Piscopo, F. Giacobbe, M. Cuccurullo, B. Gasparrini, and M. P. Pasolini, Department of Veterinary Medicine and Animal Production, University of Naples Federico II, Naples, Italy*

130 Decellularized testicular bio-scaffolds provide an optimal microenvironment for *in vitro* differentiation of chemically reprogrammed fibroblasts
G. Pennarossa[*1], *S. Arcuri*[2], *F. Di Filippo*[3], *F. Gandolfi*[3], *and T. A. L. Brevini*[1], [1]*Laboratory of Biomedical Embryology and Tissue Engineering, Department of Veterinary Medicine and Animal Science, Center for Stem Cell Research, Università degli Studi di Milano, Milan, Italy;* [2]*Department of Veterinary Medicine, Università degli Studi di Sassari, Sassari, Italy;*

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131 Supplementing omega-3 fatty acids counteracts the influence of the non-breeding season on the semen quality of South African indigenous rams
*J. N. Ngcobo**[1], *F. V. Ramukhithi*[2], *and K. A. Nephawe*[1], [1]*Tshwane University of Technology;* [2]*Agricultural Research Council, Animal Production Institute*

132 Prediction of fertility in Tankwa bucks using semen and body morphometric traits
*M. Nkadimeng**[1], *C. T. Chokoe*[2], *T. Raphulu*[3], *J. P. Sebei*[3], *and F. V. Ramukhithi*[1], [1]*Agricultural Research Council, Department of Germplasm Conservation and Reproductive Biotechnologies, Pretoria, South Africa;* [2]*Gauteng Provincial Legislature, Agriculture Land Reform, Rural Development and Environment, Johannesburg, South Africa;* [3]*Limpopo Department of Agriculture, Land Reform and Rural Development, Mara Research Station, Polokwane, South Africa*

133 Predicting bull fertility based on *in vitro* sperm function assays
A. Damor[2], *K. Hadiya*[2], *S. S. Layek**[1], *A. Kumaresan*[3], *K. B. Raval*[1], *E. S. King*[1], *and K. Karuppanasamy*[1], [1]*National Dairy Development Board, Anand, Gujarat, India;* [2]*College of Veterinary Sciences and Animal Husbandry, Kamdhenu University, Anand, Gujarat, India;* [3]*SRS of ICAR—National Dairy Research Institute, Bengaluru, Karnataka, India*

134 Assessing interobserver reproducibility of sperm motility analysis in bulls using the CASA AndroVision® system
G. Palomino, C. Chavez, H. Horellana, A. Bartolo, and E. Mellisho, Banco Nacional de Semen, Universidad Nacional Agraria La Molina, Lima, Peru*

135 Effect of a density gradient washing procedure on bison semen
*S. E. Pezo**[1], *S. X. Yang*[1], *M. Anzar*[2], *K. Rajapaksha*[2], *D. R. Farmer*[1], *J. Singh*[1], *and G. P. Adams*[1], [1]*Veterinary Biomedical Sciences, Wester College of Veterinary Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada;* [2]*Agriculture and Agri-Food Canada, Saskatoon, Saskatchewan, Canada*

136 From genes to sperm: The consequences of equine genomic inbreeding
M. Y. Arjona-Delgado, M. A. Varga-Perez, and S. Demyda-Peyrás, Department of Genetics, University of Córdoba, Cordoba, Spain*

Estrus Synchronization/Artificial Insemination

137 Reproductive outcomes in late parturition–low body condition score beef cows after GnRH-based estrus synchronization for natural service, including a novel equine chorionic gonadotropin administration timing strategy
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138 Development and field evaluation of "Heat Switch": A wearable standing heat detection system for pasture-based Japanese black cows
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139 The supplementation of toll-like receptor 2 antagonist to the semen extender of ram sperm maintains their motility during chilled storage
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140 Peripheral concentration of estradiol-17β affects ovine vaginal microbiome during intravaginal progesterone treatment for induced estrus in nonbreeding season

M. Nagano[1,2], *N. Saito*[1], *S. Sagawa*[1], *K. Momozawa*[1,2], *C. Kanno*[1], *Y. Suzuki*[3], *and H. Kubota*[4], [1]*School of Veterinary Medicine, Kitasato University, Towada, Aomori, Japan;* [2]*Center for Assisted Reproductive Technology, Kitasato University, Towada, Aomori, Japan;* [3]*Laboratory of Veterinary Hygiene, Institute of Agriculture, Tokyo University of Agriculture and Technology, Tokyo, Japan;* [4]*Department of Microbiology, Tokyo Metropolitan Institute of Public Health, Tokyo, Japan*

141 Effect of administering a single or double dose of buserelin acetate at the start of an estradiol/progesterone-based timed artificial insemination protocol in lactating Holstein cows

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142 Effect of eCG administration on Day 8 postpartum on ovarian characteristics and uterine health in high-yielding lactating dairy cows

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143 Effects of assisted calving on the reproductive efficiency of dairy cows without retained placenta

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144 Effect of estrus detection by an automated activity monitoring system at the end of timed artificial insemination protocol on conception rate of crossbred dairy cows

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145 The influence of timing in fixed-time artificial insemination on the conception risk of suckled beef cows

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146 Relationship between ovarian activity at the time of estrus synchronization and pregnancy rates in beef cattle in Northern Sonora, Mexico

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147 Ovarian structure in response to melatonin treatment duration following estrous synchronization protocols during spring mating season in South African Merino ewes

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148 Synthesis of reproductive hormones and immunological response during the estrous cycle in Zulu ewes following selenium supplementation

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149 Calving rate and paternity bias in lactating dairy cows inseminated with heterospermic and homospermic bull semen from split ejaculates

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150 Effect of systemic administration of β-NGF reconstituted before use as an ovulation inducer in llamas

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151 Effect of a double dose of PGF2α at device removal in a 5-day GnRH/P4 protocol on luteolysis and the preovulatory follicle

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Oocyte Collection

152 Quercetin supplementation modulates the transcriptome of oocytes and cumulus cells during early reproductive life in rabbits

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153 Genomic selection for embryo production: Associations with AMH, and *in vitro* embryo production in superstimulated Holstein heifers

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154 How many is too many? Impact of repeated OPU-IVP sessions on embryo production efficiency in dairy and beef cattle

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155 Effect of repeated ovum pickup sessions on oocyte recovery rate and oocyte quality in alpacas (*Vicugna pacos*)

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156 Ovum pickup in tropical environments: Oocyte recovery rates and *in vitro* embryo production in Nelore and Brahman cattle breeds

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157 The impact of ovum pickup repetition and interval duration on equine oocyte yield and quality

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158 Relationship between oocyte diameter and cumulus-oocyte complex quality following ovum pickup in alpacas (*Vicugna pacos*)
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159 Effects of vaccination against reproductive diseases at synchronization of ovulation on ovum pickup and *in vitro* embryo production in beef cows
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Oocyte Maturation

160 Insulin-like growth factor mitigates age-related changes in bovine oocytes during *in vitro* maturation
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161 Does cortisol alter developmental competence of *in vitro*–matured bovine cumulus-oocyte complexes?
A.-S. Fries, C. Polzin, F. Kotarski, G. Schuler, and C. Wrenzycki, Chair for Molecular Reproductive Medicine, Veterinary Clinic for Reproductive Medicine & Neonatalogy, Giessen, Germany*

162 Embryo development from oocytes of crossbred *Bos indicus* heifers and calves matured *in vitro* or *in vivo*
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163 Follicular fluid extracellular vesicles and their effects on bovine oocyte maturation and quality
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164 Comparison of meiotic arrest modulators during a long pre-IVM: Effects of butyrolactone I and dbcAMP-sildenafil on bovine oocytes
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165 Free fatty acids affect the steroid production and the interaction between cumulus cells and the oocyte
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166 Feasibility of JC-1-based live imaging during bovine oocyte maturation and its impact on developmental outcomes
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167 Impact of the hormonal environment during *in vitro* maturation on bovine embryo development
V. A. P. Alfradique, L. N. Cajaiba, G. R. Leal, T. A. Oliveira, M. P. P. Guimarães, L. N. Marçal, and J. M. G. Souza-Fabjan, Universidade Federal Fluminense*

168 Characterization of transcripts related to mitochondria-nuclear communication during *in vitro* maturation of bovine oocytes
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169 EGFR signaling and pyruvate availability coordinate cumulus cell and oocyte metabolism
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170 Nicotinamide mononucleotide supplementation during *in vitro* maturation partially mitigates heat stress–induced damage in bovine oocytes
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171 Obtaining and *in vitro* maturation of domestic cat oocytes at different times
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172 Equine cumulus-oocyte complex maturation under different follicle stimulating hormone concentrations in time-lapse incubator
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173 Extracellular vesicles from heat and oxidative stressed granulosa cells modulate bovine *in vitro* embryo development and quality
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174 Investigating the impact of albumin on porcine oocyte competence
C. E. Grote, I. C. Rodriguez, E. R. Nold-Schoelerman, M. E. Brockman, K. C. Kerns, and A. F. Keating, Iowa State University, Ames, IA, USA*

175 Epigenetic upregulation of MTNR1A signaling via CRISPR/dCas9-Tet1 enhances porcine oocyte competence by promoting NRF2-mediated antioxidant transfer
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176 Evaluating FGF2, LIF, and IGF1 supplementation during *in vitro* maturation to enhance equine ICSI embryo development
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177 Effect of zinc-enriched maturation on parthenogenetic development and DNA stability in bovine embryos following zinc chelation
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178 Cumulus cells regulate oocyte gene expression to support *in vitro* developmental competence in pigs
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Periconceptional/Fetal Programming

179 Rumen-protected methionine supplementation during the periconceptional period to beef cows induces persistent changes in DNA methylation in the whole blood of female offspring
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180 DNA methylation dynamics in nuclear-encoded mitochondrial genes during bovine preimplantation development
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Stem Cells

182 Mesenchymal stem cells as a regenerative medicine therapy: A therapeutic and prophylactic for hoof wounds in livestock
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183 Transition of embryonic stem cells to low oxygen conditions reveals changes associated with energetic metabolism without altering the pluripotency core
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184 Effects of modifying preculture conditions on differentiation of bovine embryonic stem cells toward a primordial germ cell-like lineage
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Superstimulation

185 Dose-dependent effects of FSH on ovarian response and embryo production in young heifers
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186 Effect of uterine stimulation on embryo recovery from superovulated donor cows
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187 Superstimulation with a single injection of a porcine pituitary extract prior to OPU and *in vitro* embryo production in beef cows
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Developmental Biology

188 Multipolar mitosis as a self-correction mechanism for polyploidy in preimplantation mouse embryos
K. Bielski, R. Zhao, A. Bakhtari, J. Liu, X. Tian, and Z. Guan, University of Connecticut, Storrs, CT, USA*

189 Mapping transcript distribution in *in vitro* bovine embryos using spatial transcriptomics
A. T. De Oliveira, B. Bangert, M. Rubessa, D. Milner, J. Okonkwo, N. Ponnuraj, M. Sivaguru, and M. B. Wheeler, University of Illinois Urbana–Champaign, Urbana, IL, USA*

190 Spatial transcriptomics of *in vivo*–produced bovine embryos: Transcript density in three distinct embryonic cell lineages
A. T. De Oliveira, M. Rubessa, D. Milner, A. M. Berbel, N. Ponnuraj, M. Sivaguru, and M. B. Wheeler, University of Illinois Urbana-Champaign, Urbana, IL, USA*

191 Expression patterns of growth factors (*IGFBP3-VEGFA-EGFR*) and apoptosis (*BCL2L2-APAF1*)–related genes in oviductal epithelial cells of bovine creole (BON) and introduced breeds in Colombia
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192 Metabolomics uncovers early predictors of blastocyst formation in equine ICSI embryos
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193 Volatolomic profiles of *in vitro*–produced bovine embryos
M. Nõmm[1], P. Gómez[2], C. Ossa[3], D. P. Barajas[4], J. Carrasco[5], E. Villaroel[3], S. F. Sim[6], L. Dines[6], X. Vilanova[7], E. Llobet[7], Ü. Jaakma[1], and R. Ionescu[1], [1]Institute of Veterinary Medicine and Animal Sciences Estonian University of Life Sciences, Tartu, Estonia; [2]University of Pamplona, Pamplona, Colombia; [3]University of Caldas, Manizales, Colombia; [4]Cooperative University*

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194 Ultrastructural characterization of the zona pellucida during bovine *in vitro* embryo development

A. L. Reyes[1,2]*, B. Barcelona*[3]*, N. Rodríguez-Osorio*[4]*, and F. Báez**[3]*,* [1]*Unidad de Microscopía Electrónica de Barrido, Universidad de la República (UdelaR), Facultad de Ciencias, Montevideo, Uruguay;* [2]*Plataforma de Citometría de Flujo y Clasificación celular del Instituto de Investigaciones Biológicas Clemente Estable—Ministerio de Educación (IIBCE-MEC), Montevideo, Uruguay;* [3]*Instituto Superior de la Carne, Centro Universitario Regional Noreste, Universidad de la República, Tacuarembó, Uruguay;* [4]*Unidad de Genómica y Bioinformática, Departamento de Ciencias Biológicas, Centro Universitario Regional Litoral Norte, Universidad de la República, Salto, Uruguay*

195 Proteomic profile of oviductal fluid in alpacas at different times postinsemination: Keys to understanding sperm transport

*K. Sánchez-Caycho**[1]*, E. Callegari*[2]*, J. Pacheco*[3]*, W. García*[3]*, and E. Mellisho*[1]*,* [1]*Centro de Investigación en Tecnología de Embriones, Universidad Nacional Agraria La Molina, Lima, Lima, Peru;* [2]*Division of Basic Biomedical Sciences Sanford School of Medicine, University of South Dakota, Vermillon, SD, USA;* [3]*Estación Maranganí del Instituto Veterinario de Investigaciones Tropicales y de Altura, Universidad Nacional Mayor de San Marcos, Marangani, Cusco, Peru*

196 Antioxidant overload triggers mitochondrial hydrogen peroxide accumulation in bovine zygotes: Application of HyPer7 imaging

*V. Lodde**[1,2]*, S. K. N. Bonumallu*[1]*, M. Plevridi*[1]*, N. Katsakoglou*[3]*, M. Barragan*[4]*, I. Ezquer*[5]*, F. Franciosi*[1,2]*, and A. M. Luciano*[1,2]*,* [1]*Reproductive and Developmental Biology Laboratory (ReDBioLab), Department of Veterinary Medicine and Animal Sciences, University of Milan, Milan, Italy;* [2]*Center for Reproductive Biotechnology and Cryobanking (CRBC), Department of Veterinary Medicine and Animal Sciences, University of Milan, Milan, Italy;* [3]*Department of Molecular Biology and Genetics of the Democritus University of Thrace (DUTH), Alexandroupoli, Greece;* [4]*Eugin Group, Research and Development, Barcelona, Spain;* [5]*Department of Biosciences, University of Milan, Milan, Italy*

197 Effect of extracellular vesicles from fetal bovine serum on lipolytic activity during *in vitro* maturation of bovine oocytes

*P. A. Ferraz**[1]*, F. Schneberger*[1]*, A. Bridi*[2]*, J. R. Quirino de Oliveira*[1]*, L. Calixto Munhoz*[1]*, L. Cardoso Zoccal Janini*[1]*, J. Coelho da Silveira*[1]*, and C. Lima Verde Leal*[1]*,* [1]*Faculdade de Zootecnia e Engenharia de Alimentos da Universidade de São Paulo, FZEA USP, Pirassununga, SP, Brazil;* [2]*Universidade do Oeste de Santa Catarina, UNOESC, Xanxerê, SC, Brazil*

198 Oviductal extracellular vesicle-associated bta-miR-483-3p from pregnant cows modulates gene expression in preimplantation embryo

*R. Mazzarella**[1]*, G. Santos*[1]*, C. A. Martinez-Serrano*[2]*, Y. N. Cajas*[3]*, K. Cañón-Beltrán*[4,5]*, L. V. S. Ñaupas*[1]*, L. Arévalo*[1]*, H. Rodriguez-Martinez*[6]*, E. González*[7]*, and D. Rizos*[1]*,* [1]*Department of Animal Reproduction, INIA-CSIC, Madrid, Spain;* [2]*Department of Animal Biotechnology, INIA-CSIC, Madrid, Spain;* [3]*Department of Agrarian Production, Technical University of Madrid (UPM), Madrid, Spain;* [4]*Department of Biochemistry and Molecular Biology, Veterinary Faculty, Complutense University of Madrid (UCM), Madrid, Spain;* [5]*Programa de Medicina Veterinaria y Zootecnia, Grupo Kyron, Corporación Universitaria del Huila (CORHUILA), Huila, Colombia;* [6]*Department of Biomedical & Clinical Sciences (BKV), BKH/Obst & Gyn, Linköping University, Linköping, Sweden;* [7]*Department of Anatomy and Embryology, Veterinary Faculty, Complutense University of Madrid (UCM), Madrid, Spain*

199 Paternal aging affects histone acetylation and preimplantation embryo development in mice

L. A. Stábile, L. S. Cotrin, E. C. S. Santos, C. A. P. Nagaki, C. M. Mendes, M. D. Goissis, and M.

E. O. A. Assumpção, Department of Animal Reproduction, School of Veterinary Medicine and Animal Science, University of Sao Paulo, Sao Paulo, Sao Paulo, Brazil*

200 Isolation of Asturiana de los Valles preantral follicles

P. Nieto[1], P. Romero[1], A. del Cerro[1], A. García[1], S. Carrocera[1], C. Díez[1], and M. Muñoz[1], [1]Área de Genética y Reproducción, SERIDA, Centro de Biotecnología Animal, Gijón, Asturias, Spain; [2]Scientific-Technical Services, University of Oviedo, Asturias, Spain*

201 Establishment of endometrial organoids from cross-species mammalian models: Toward a comparative platform for uterine biology

D.-H. Kwon[1], S. Y. Lee[1], G. M. Gim[1,2], K. H. Eom[1,2], B. H. Lim[3], S. Y. Yum[2], J. Choi[1], Y. C. Kim[1], J. Ye[1], H. Jang[1], J. S. Kim[4], C. W. Park[5], S. I. Kim[5], K. R. Hwang[5,6], G. Jang[1,2], [1]Department of Theriogenology, College of Veterinary Medicine and the Research Institute for Veterinary Science, Seoul National University, Republic of Korea; [2]LARTBio Inc., Seoul, Republic of Korea; [3]Department of Animal Science and Technology, Chung-Ang University, Anseong, Republic of Korea; [4]Primate Resources Center (PRC), Korea Research Institute of Bioscience and Biotechnology (KRIBB), Jeongeup-si, Republic of Korea; [5]Department of Obstetrics and Gynecology, Seoul National University College of Medicine, Seoul, Republic of Korea; [6]Department of Obstetrics and Gynecology, Seoul Metropolitan Government Seoul National University Boramae Medical Center, Seoul, Republic of Korea*

202 Exploring the histone epigenome of bovine sperm and preimplantation embryos

S. C. Stephens, A. R. Dodd, and L. J. Luense, Texas A&M University, Department of Animal Science, College Station, TX, USA*

205 Hormonal modulation of bovine oviductal organoids derived from distinct anatomical regions

M. G. Millán de la Blanca[1,2], G. dos Santos[1], C. Núñez *Puente[1], B. Fernandez-Fuertes[1], M. E. González[2], and D. Rizos*[1], [1]Department of Animal Reproduction, National Institute for Agriculture and Food Research and Technology (INIA-CSIC), Madrid, Spain; [2]Department of Anatomy and Embryology, Faculty of Veterinary, Complutense University of Madrid (UCM), Madrid, Spain*

206 Embryonic genome transcription in cattle occurs as early as the 4-cell stage and involves mRNA processing factors, epigenetic regulators, and conserved transcription factors

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208 Influence of estradiol on the preovulatory oviductal ampulla microenvironment in dairy Holstein cows

F. Cuadro[1,2], G. D. A. Gastal[2], V. de Brun[3], E. Jara[3], B. G. Gasperin[4], M. T. Rovani[5], and A. Menchaca[1,2], [1]Fundación IRAUy, Uruguay; [2]Plataforma de Investigación en Salud Animal, Instituto Nacional de Investigación Agropecuaria (INIA), Uruguay; [3]Facultad de Veterinaria, Universidad de la República, Uruguay; [4]Universidade Federal de Pelotas, Brazil; [5]Universidade Federal do Rio Grande do Sul, Brazil*

209 Interleukin-6 restores embryonic disc development in bovine blastocysts placed into extended culture

M. A. Oliver[1], A. B. Pollock[1], A. T. Thornton[1], V. R. G. Mercadante[1,2], and A. D. Ealy[1], [1]School of Animal Sciences, Virginia Tech, Blacksburg, VA, USA; [2]School of Agriculture and Food Sustainability, University of Queensland, Brisbane, QLD, Australia*

Undergraduate Student Competition Finalists

211 The effects of antibiotics on *Mycoplasma bovis* in bison semen

E. Bletsky, S. Pezo, S. X. Yang, J. Singh, and G. P. Adams, Department of Veterinary Biomedical Sciences, Western College of Veterinary Medicine, University of Saskatchewan, Saskatoon, Saskatchewan, Canada*

212 Effect of nicotinamide mononucleotide supplementation on post-thaw sperm function and *in vitro* embryo development in cattle

*R. Ochoa Restrepo**[1], *F. Correa Monsalve*[1,2], *J. D. Montoya*[2], *O. Velasquez Arboleda*[2], *M. Duque Rodríguez*[1,2], *and R. Urrego*[1], [1]*Grupo INCA-CES, Facultad de Medicina Veterinaria y Zootecnia, Universidad CES, Medellín, Antioquia, Colombia;* [2]*Grupo de Investigación en Biotecnología Animal (GIBA), Politécnico Jaime Isaza Cadavid, Medellín, Antioquia, Colombia*

213 *In vitro* spermatogenesis in porcine testicular organoids: Effects of media and supplementation

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Exhibit Schedule

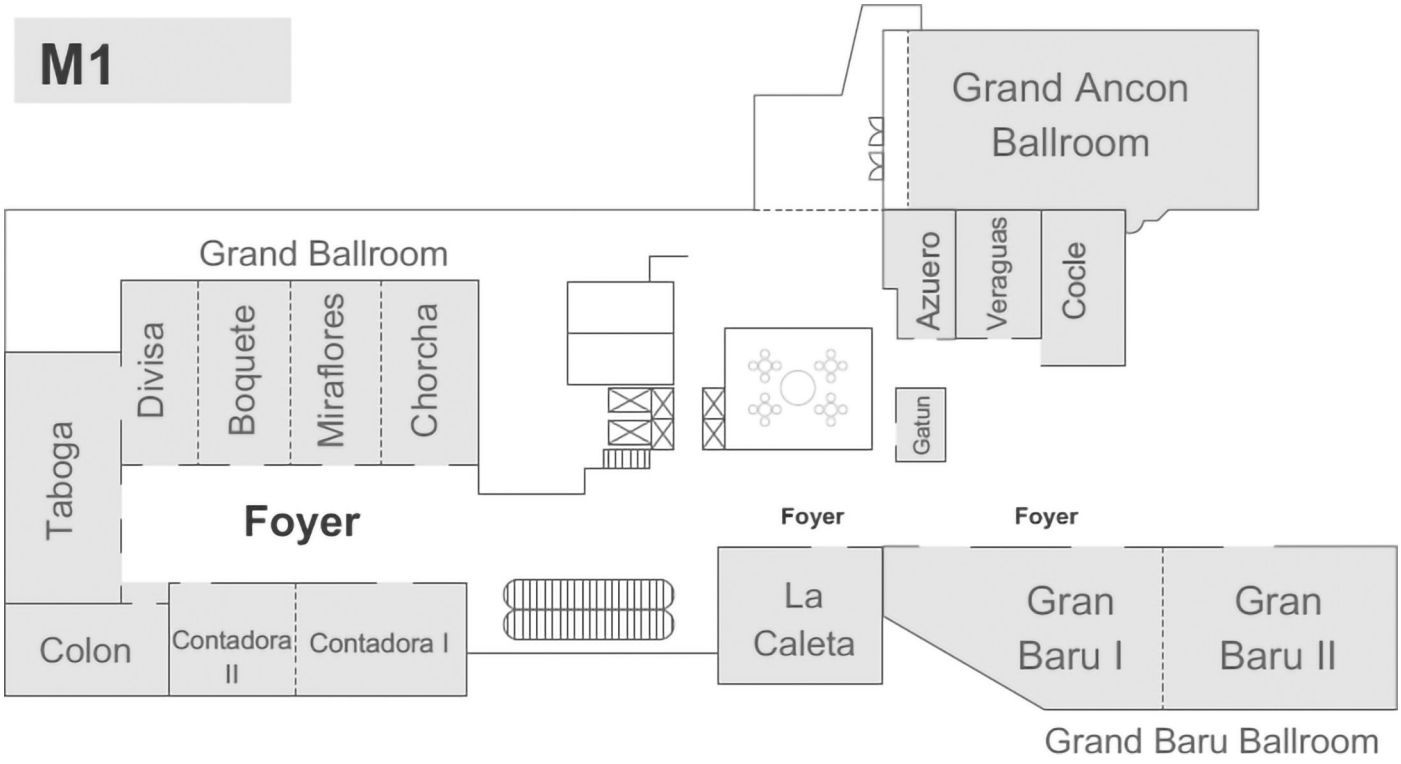
Saturday, January 17
Set Up Exhibits 13:00–17:00

Sunday, January 18
Exhibits Open 08:00–20:00

Monday, January 19
Exhibits Open 08:00–17:30

Tuesday, January 20
Exhibits Open 9:00–13:30

Hotel Floor Plan



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IVF Bioscience
Booth 13

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Partnar Animal Health
Booth 27

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 embryo.

+1-866-690-4998
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Professional Embryo Transfer Supply Inc. (PETS)
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Booth 3

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 E.T. supplies from ICPbio, MAI, Vetoquinol, ABT360, SPI, IMV, Wesco, and more. Come visit with us for more details.

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Stroebech Media
Booth 16

With 40+ years of media manufacturing in an ISO-certified facility for veterinary and human IVF, we provide an optimized range for IVF embryo production in bovine, equine, small ruminants, and wildlife. We provide step-by-step protocols, quality control tests, and transport stability test, demonstrating media maintain performance and 18 months shelf life when stored at 37 degrees for 14 days. Additionally we offer personalized technical support by professionals with actual IVF experience.

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Toronto Zoo
Friend Sponsor

The Toronto Zoo is a leader in cryopreservation of living cells (sperm, eggs, embryos and cell cultures) across the animal kingdom, the utilization of biobanked samples for assisted reproduction, the collaboration with Indegnous communities on conservation action and education, research with academic, government and non-government partners and the knowledge translation and dissemination. Since 2009, all wood bison calves born at the Toronto Zoo have been the product of assisted reproductive technologies. In 2015, a wood bison calf was born using sperm that had been cryopreserved for 35 years, demonstrating the long-term viability of stored genetic material. The Toronto Zoo aims to expand the Cryobank, collaborating with government and Indigenous conservation organizations, to enhance cryobanking efforts nationwide. This initiative aligns with global biodiversity goals and reinforces the Zoo's commitment to protecting wildlife for future generations.

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Trans Ova Genetics
Silver Sponsor

Trans Ova Genetics is a leader in advanced reproductive technologies, offering services such as in vitro fertilization (IVF), embryo transfer, and genetic preservation for livestock producers. With a commitment to innovation and client success, Trans Ova empowers producers to enhance herd genetics, improve efficiency, and build a lasting legacy in the agricultural industry.

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VetMotl, Inc.
Booth 24

VetMotl, Inc., a Delaware corporation established in December 2022, is commercializing worldwide the VetMotl™ Sperm Separation Devices, first-of-their-kind devices for use in veterinary assisted reproductive technology (ART) procedures. We are a Maryland, USA-based and globally recognized company who pioneered this innovative, game-changing laboratory tool for

preparing high-quality, high-motility sperm samples for assisted reproduction.

Devices based on our technology have been commercialized worldwide for over 10 years for use in human fertility clinics as ZyMōt® Sperm Separation Devices. VetMotl devices for veterinary application provide the cleanest, highest quality samples of optimally functional sperm in equine and bovine ART procedures, with demonstrated effectiveness in other animal species, as well (e.g., small ruminants (ovine, caprine), porcine, canine).

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Vetoquinol USA Inc.
Diamond Sponsor

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.

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WTA Technologies LLC
Booths 25 and 26

WTA – Watanabe Tecnologia Aplicada is a Brazilian technology company specialized in the development and production of equipment and consumables used in all animal reproduction processes. With over 20 years of international operations and a branch in College Station TX, the company exports to over 62 countries.

Using its own technology, WTA offers the best solutions for egg collection (OPU), in vitro fertilization (IVF), embryo transfer (ET) and artificial insemination (AI) for cattle, horses and small ruminants, as well as meeting the needs of laboratories specialized in animal reproduction. WTA's equipment and products are durable, reliable and developed especially for breeders, veterinarians and professionals who provide the most diverse reproductive services – all at highly competitive prices.

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

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