



# Program Book

IETS 49th Annual Conference  
Lima, Peru  
January 16–19, 2023



# Program Book

**49th Annual Conference of the  
International Embryo Technology Society**

**Walking the Line Between  
Science and Industry**



**Westin Lima Hotel & Convention Center  
San Isidro, Lima, Peru  
January 16–19, 2023**

**Scientific Program Co-Chairs:  
Hanna Grothmann and Felipe Perecin**

# Pluset

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## 2022 IETS Board of Governors

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SCAN ME

# Preface

The IETS Annual Meeting goes to South America!

With Lima, Peru, as the host for the 49th Annual Meeting of the IETS, a beautiful city was chosen. Lima, the fourth-largest city on the continent, is a showcase of the country's vast cultural, historical, and natural treasures. Peru offers more than 10 natural and cultural sites listed by the UNESCO World Heritage Convention, including the Manú National Park, Machu Picchu, and the old town of Lima itself.

The theme of this year's conference, "Walking the Line Between Science and Industry," addresses practitioners and scientists alike, as it points toward the challenges that have arisen with the global number of embryos produced increasing almost exponentially over the last decade. Concurrently, ever-growing knowledge of molecular processes within germ cells, embryos, and their surroundings is available.

The program's theme complements the needs of scientists and industry alike. As produced embryos will result in the next generation of donors (and recipients), the program's aim is to pursue the course of embryo development from germ cells to offspring. Understanding and transcribing the processes underlying healthy embryo development is essential for scientists and practitioners. Ideal conditions result in healthy offspring, whereas suboptimal starting conditions may occur during any phase of early embryonic and fetal development and may affect the next generation. The sessions are designed to illustrate this connection.

The speakers come from well-established groups, as well as from rising groups. All were selected to share the newest scientific results and their implications in the field with the audience of the IETS.

With no less than three preconference opportunities, the needs of both scientists and practitioners are addressed. Both DABE and HASAC put together programs for their Preconference Workshops that reflect current topics. The Workshop on Advances in Reproductive Technologies in Camelids is thematically closely connected to the location of this year's annual conference.

In the concurrent sessions, the CANDES group will share novel findings in new world camelids and other non-domestic species. The Practitioner's Forum, as the second of the Concurrent Sessions, focuses on the reduction of pregnancy losses in OPU-IVP programs and promises lively discussions among participants.

Finally, an increased number of short oral presentations chosen from the submitted abstracts will give both young and established scientists the opportunity to present their work in front of the IETS audience.

Hanna Grothmann and Felipe Perecin, Co-Chairs

# Acknowledgments

We would like to express our gratitude to the many people who make this meeting possible.

We thank all the speakers for accepting our invitation and for the effort and kind willingness to comply with the deadlines in preparing the review articles. We are also thankful for the dedicated team of reviewers who carefully revised the manuscripts.

A team of abstract session chairs and reviewers worked intensively to evaluate and make decisions on the abstracts submitted for this meeting. We thank them all!

We also appreciate and recognize the effort that our colleagues have put in place to make the annual meeting possible and organized brilliantly. The list is extensive, and we hope not to forget anyone. We thank the Peruvian Local Organizing Committee—Manuel Palomino, Wilfredo Huanca, William Huanca, and Aida Cordero—for all the local arrangements and the coordination of the workshop on camelid reproduction; Gabriel Bo and Carolina Herrera, for accepting the task to co-chair the practitioners' forum; Marcia Ferraz, for organizing the DABE preconference on synthetic embryos; George Perry and Marc-André Sirard, for the HASAC preconference symposium; Dragos Scarlet, for organizing the CANDES session; the members of the IETS Foundation, represented by João Vianna and Paula Tribulo; and the “next gen” of IETS, the Morulas, represented by Krishna Pavani. Thank you all for your enthusiasm and continued support for the meeting and the society!

We started the long preparation for this meeting in mid-2020. We sincerely thank former IETS President Pascale Chavatte-Palmer and the previous Board of Governors for the privilege of choosing us as co-chairs. We are also thankful to the current BOG, led by Cesare Galli, for the input and for being supportive during this journey.

We acknowledge the dedication and support of Debi Seymour. Debi, you made our mission much easier! Thanks so much!

Finally, we thank you all for attending the 2023 IETS Annual Meeting!

Hanna Grothmann and Felipe Perecin, Co-Chairs

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## Recipient of the 2023 IETS Pioneer Award

**Enoch Borges de Oliveira Filho, DMV, MSc, PhD**



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

**Award Presentation: Thursday, January 19, at 13:45**

### Previous Recipients

C. Keefer (2022)	S. P. Leibo (2009)	N. W. Moore (1994)
Not awarded (2021)	G. Seidel Jr. (2008)	R. G. Edwards (1993)
E. Palmer (2020)	A. Iritani (2007)	R. L. Brinster (1992)
B. Bavister (2019)	D. Kraemer (2006)	A. K. Tarkowski (1991)
M.-A. Sirard (2018)	S. Willadsen (2005)	J. D. Biggers (1990)
D. T. Armstrong (2018)	B. Brackett (2004)	C. Thibault (1989)
H. Niemann (2017)	K. Betteridge (2003)	A. L. McLaren and D. Michie (1988)
C. E. Pope (2016)	R. H. Foote (2002)	E. J. C. Polge (1987)
K. H. S. Campbell (2015)	P. J. Dziuk (2001)	T. M. Sugie (1986)
J.-P. Renard (2015)	R. Yanagimachi (2000)	L. E. A. Rowson (1985)
W. W. Thatcher (2014)	R. M. Moor (1999)	L. E. Casida (1984)
J. Hahn (2013)	I. Gordon (1998)	M. C. Chang (1983)
O. J. Ginther (2012)	S. Wintenberger-Torres (1997)	R. O. Berry (1982)
I. Wilmut (2011)	W. K. Whitten (1996)	
R. J. Mapletoft (2010)	C. R. Austin (1995)	

Dr. Enoch Borges de Oliveira Filho was born on June 6, 1944, in a small city called Monte Azul Paulista, which in English means Blue Mountain, in the countryside of São Paulo State in Brazil. He very early showed an agricultural and animal science vocation. His first activities in these areas started in 1960 to 1962, during his studies at agricultural and animal industry internal college in Pirassununga City, also in São Paulo state. From 1965 to 1968, mostly during the military government in Brazil, he studied Veterinarian Medicine at Rural Federal University of Rio de Janeiro (UFRJ) in a city called Seropédica, not far away from the marvelous city and built in an old farm where they produced silkworm during the Empire.

Dr. Oliveira's first appointment in 1972 was in the Universidade Federal Fluminense, also in Rio de Janeiro, where he was dedicated to dairy production. His master's degree focused on cattle reproduction and was supervised by Dr. Megale, one of the most recognized researchers at the time in Brazil, at the Universidade Federal de Minas Gerais. He then changed his appointment to the University of São Paulo, again in Pirassununga, where he taught genetic selection and in 1977 had his PhD supervised by Dr. Moura Duarte, a human geneticist interested in cattle. In his PhD, he developed quantitative genetics expertise and delivered the first EPD on reproduction (average reproductive value at the time) in the Nellore cattle Breed (Oliveira-Filho et al., 1975a, b).

It is worth mentioning that by the mid-1960s the Zebu cattle breeds were somehow "rediscovered" in Brazil and experienced a new round of importations from India, with a new offer of genetics, distinct from those previously bred in Brazil. From studies in many institutions like ABCZ (Brazilian Association of Zebu Breeders) and USP (Universidade de São Paulo), for example, many *Bos indicus* breeds started to grow in number and importance for tropical production.

Dr. Oliveira finally decided to internationalize his career and moved to Gainesville, Florida, where he did a sabbatical training at the University of Florida, financed by the American States Organization, and supervised by Dr. Marvin Koger, working with beef cattle genetics (Oliveira-Filho et al., 1979, 1983).

Back in Brazil in 1982, Dr. Oliveira moved again from Pirassununga to UNESP Jaboticabal, a city very close to his natal city. There he was engaged in the reproduction department and had his first contact with a COC and an oocyte presented by Dr. Parvati Basur, of Guelph University, in one of her visits to Brazil organized by Dr. Pinheiro. At that time, Brazilian Society of Embryo Transfer was founded, and later renamed as Brazilian Society of Embryo Technology.

"That was my first experience with this gamete, and it was love at first sight," said Dr. Oliveira.

However, life is never easy with pioneers. Dr. Oliveira's application to become a member of the Sociedade Brasileira de Tecnologia de Embriões (SBTE) was denied twice until he showed he was able to collect and transfer embryos accordingly.

He then went on another sabbatical in 1987 to the University of Cambridge, financed by the British Council and supervised by Dr. Christopher Polge, to work on embryo transfer and IVF, and soon after in 1988 to the "Laboratoire Pour Le Controle Des Reproducteurs" in Maisons-Alfort, France, to work with embryo production and micromanipulation.

By this time, IVF was an obsession, and fortunately, the pioneer could get the first funding from the São Paulo Research Foundation (FAPESP), which enabled the production of the first *B. indicus* embryo in 1991. "We were happy to have a great number of international collaborators, that came to Brazil to give talks but also stayed for short periods in many Brazilian laboratories, not only showing high-quality science but also generosity," Dr. Oliveira said. This behavior was propagated to the SBTE, with a higher dose of heparin, taught to be essential for zebu IVF, and an even greater dose of dedication by many technicians, graduate students, and collaborators. IVF and other embryo technologies, including cloning and PGDs, started to be discussed in the SBTE meetings, especially by 1992/93 under Dr. Oliveira's presidency. In 1993, our pioneer predicted that IVF would become commercially viable and perhaps would be as useful as MOET technology.

The last activity in his university position was a sabbatical leave in 1995 to the Hôpital Saint-Louis, in Paris, on genetic markers. Back in Brazil, he retired and started a new life as a farmer in the north of the country, where he applied all the embryo technology in his purebred Nellore herd.

Meanwhile, OPU methodologies, ultrasound, and other equipment had an impressive technological evolution, allowing large-scale collection of gametes, especially in zebu, which, for a reason not completely understood, offer a greater pool of antral follicles to recover by OPU. Hence, the synchronization studies and fixed-time embryo transfer reached very successful rates, allowing larger scale embryo transfer.

Altogether, these advances conspired to make the very small city of Jaboticabal one of the most important sites for cattle IVF in Latin America; many people received their training at UNESP and a few started commercial laboratories, which spread out until Dr. Oliveira's prediction became a reality in Brazil (Watanabe et al., 2000).

In 2022, Dr. Oliveira received the first Pioneer Award granted by the SBTE (created by inspiration of the IETS Award), due to his work in establishing and stimulating studies in IVP. This effort reached an international level, and the IETS, in recognition of good services to embryo technologies development and dissemination, congratulates Dr. Enoch Borges de Oliveira Filho, one well-deserved recipient of the 2023 IETS Pioneer Award.

## References

Lobo R. B., E. B. Oliveira Filho, F. A. M. Duarte, A. A. M. Goncalves, A. A. Ramos, 1983. Effects of age at first calving, gestation length and dry period on milk yield in a Gyr herd. *Rev. Bras. Genet.* 6:307–318.

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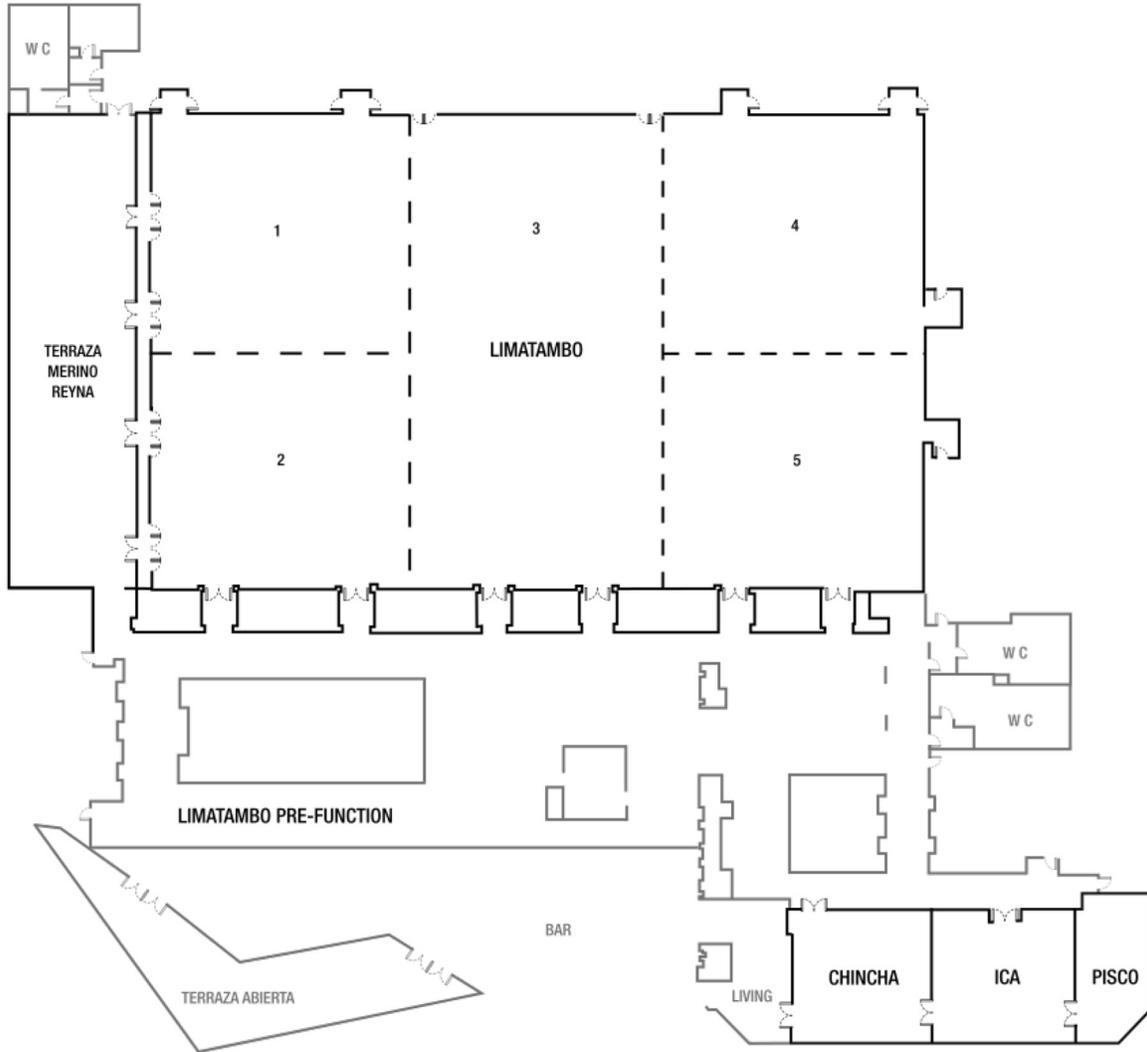
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# Map of the Venue

Westin Lima Hotel & Convention Center

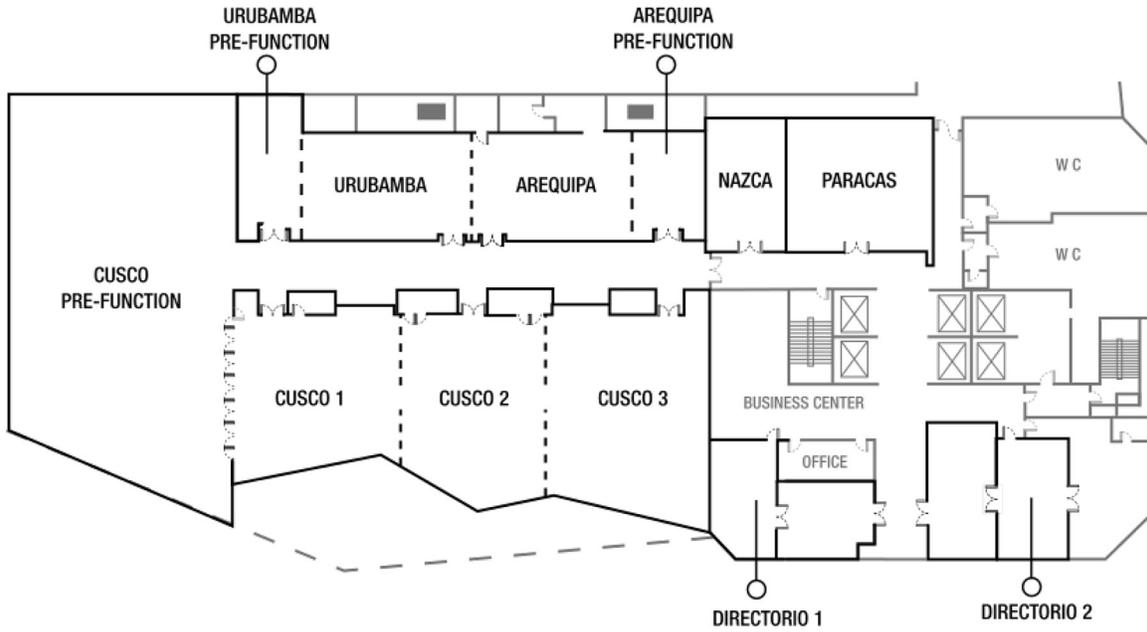
## Meeting Space (Third Floor)



# Map of the Venue

Westin Lima Hotel & Convention Center

## Meeting Space (Fourth Floor)



# General Information

## Meeting Room Directory

Main conference sessions	Limatambo 4, 5
Exhibits	Limatambo 1, 2, 3
Poster displays	Limatambo 1, 2, 3

Please see the Scientific Program for additional room assignments.

## Registration Desk Hours

The registration desk is located on the third floor, Limatambo Pre-function.

## Pickup of Preregistration Packets

Sunday, January 15	16:00–19:00
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## Onsite Registration Hours

Monday, January 16	07:00–18:00
Tuesday, January 17	07:00–18:00
Wednesday, January 18	07:30–16:00
Thursday, January 19	08:00–14:00

## Exhibit Information

Exhibits will be located in Limatambo 1, 2, 3.

## Exhibit Setup

Monday, January 16	13:00–18:00
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## Exhibits Open

Tuesday, January 17	09:00–18:00 17:00–18:30 (Reception)
Wednesday, January 18	08:00–17:00
Thursday, January 19	08:30–13:00

## Exhibit Teardown

Thursday, January 19	13:00–16:00
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All registrants of the 49th IETS Annual Conference will find a game board in their registration bags. Take time to meet the exhibitors and fill your game boards. All completed game boards will be eligible for a drawing for one of four prizes on Thursday, January 19, immediately before the George E. Seidel Keynote Lecture.

Details on the exhibitors can be found in the Exhibit Directory on page 56.

## Badges

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

## Certificates of Attendance

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

## Currency

The Sol is the legal tender in Lima, Peru. Should you need to exchange the local currency, you will be able to do so at the larger airports and at ATMs. Credit cards are also widely accepted in Lima.

## Passport and Visa Information

As with all IETS meetings, we expect attendees from all over the world. Check if you need a visa to enter Peru. **Citizens of Argentina, Brazil, Paraguay, Uruguay, Ecuador, Colombia, Bolivia, and Chile may enter Peru with their national identity document. Most countries from Europe, Latin America, and North America do not need visas. For a list of visa-free countries that only need a passport to travel to Peru, go to: <https://visaindex.com/visa-requirement/peru-passport-visa-free-countries-list>.**

## Climate

In January, daytime high temperatures tend to be mostly in the high 70s (°F; ~26°C), and overnight lows tend to average in the mid to upper 60s (°F; ~23°C).

Dressing in layers and natural fabrics that breathe will help you cope with the temperature changes. You may need a light sweater or jacket for cooler mornings and evenings. If you will be trekking in the mountains or jungle, bring a waterproof raincoat. Business casual may be worn for the meeting.

Lima is a city that rewards patient exploration. Beyond the magnificent colonial architecture of its central plaza and the treasures of its archaeological museums, the subtle charms of Lima are found in its bustling seafood markets, the thrilling drumbeats of its Afro-Peruvian music, and the tranquil seaside plazas where friends gather in the late afternoon. Wear comfortable, warm shoes or boots when sightseeing.

## Registration Fees

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

## Messages

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

## Refreshments

Morning and afternoon refreshments are included in your registration fee and are provided during the scheduled break times in the exhibit area, located in Limatambo 1, 2, and 3 on the third floor of the Westin Lima Hotel.

## Dining and Entertainment

Choose from one of several unique dining establishments at The Westin Lima Hotel & Convention Center. Invigorate your senses with original Peruvian dishes at Maras, a sleek, upscale restaurant. You'll find wholesome, seasonal offerings in a more casual setting at Market 770. El Salar, a vibrant bar at Maras, serves up an array of tantalizing gins and hand-crafted cocktails. Relax, drink in hand, on plush leather sofas at Insitu Bar, decorated to look and feel like a British pub. Located on the first floor of the hotel, Lobby Lounge serves delicious small plates and a wide selection of Pisco, the national brand of Peru. Revitalize yourself with a variety of nutritious on-the-go drinks and snacks from Takeat, the coffee house on the first floor.

## Services and Amenities

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

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# Program

## Saturday, January 14

09:00 – 17:00 IETS Board of Governors meeting (Chincha)

## Sunday, January 15

09:00 – 17:00 IETS Board of Governors meeting (Chincha)

09:00 – 13:00 HASAC Research Subcommittee Meeting (ICA)

13:50 – 18:45 Preconference Virtual Workshop – Advances in Reproductive Technologies in Camelids

14:00 – 19:00 HASAC Regulatory Subcommittee Meeting (ICA)

19:00 – 20:00 HASAC Forms and Certificates Subcommittee Meeting (ICA)

## Monday, January 16

07:30 – 18:15 Preconference Workshop, Module 2 – Reproductive Technologies in Alpaca

08:50 – 17:00 HASAC Preconference – Media news or new media – How safe are *in vitro*-produced embryos for international trade? (Limatambo 4, 5)

09:00 – 18:30 DABE Preconference – Modeling embryo function *in vitro*: the era of synthetic embryos (Cusco 1, 2)

13:00 – 18:00 Exhibitor Setup (Limatambo 1, 2, 3)

13:00 – 18:00 Poster Setup (Limatambo 1, 2, 3)

17:00 – 20:30 IETS Foundation Board of Trustees meeting (Chincha)

19:00 – 20:00 HASAC Emerging Technologies Subcommittee Meeting (ICA)

## Tuesday, January 17

07:00 – 08:30 Poster Setup (Limatambo 1, 2, 3)

07:00 – 08:30 Past Presidents' Breakfast (Chincha)

07:00 – 08:30 Graduate and Undergraduate Student Competition Presenters' Breakfast, with IETS Foundation Education Chair (ICA)

09:00 – 18:00 Commercial Exhibits (Limatambo 1, 2, 3)

08:30 – 08:45 Opening and Welcome (Limatambo 4, 5)

### Session I: Getting a head start – Requirements for generating healthy offspring (Limatambo 4, 5)

*Session co-chairs: Marc-André Sirard, Université Laval, and Osvaldo Bogado Pascottini, Ghent University*

08:45 – 09:30 Maternal metabolic health and fertility: We should not only care about but also for the oocyte!  
*Jo Leroy, University of Antwerp, Belgium*

09:30 – 10:15 Maternal nutrition and developmental programming of offspring  
*Lawrence Reynolds, North Dakota State University, USA*

10:15 – 11:00 Refreshment Break/Poster Viewing and Exhibits (Limatambo 1, 2, 3)

### IETS Foundation Student Competition Presentations (Limatambo 4, 5)

*Session chair: Paula Tribulo, Instituto de Reproduccion Animal Cordoba (IRAC)*

11:00 – 11:15 Culture with choline chloride programs development of the *in vitro*-produced bovine embryo to increase postnatal body weight, growth rate and testis size  
*M. L. J. Haimon\*, E. Estrada-Cortés, T. F. Amaral, S. Jeensuk, J. Block, D. Heredia, M. Venturini, C. Santos Rojas, A. Gonella-Diaza, N. DiLorenzo, and P. J. Hansen (Abstract 1)*

- 11:15 – 11:30 Inhibition of mitochondrial ATP-production during *in vitro* maturation of bovine oocytes alters DNA methylation patterns in mature oocytes and resulting embryos  
*B. Meulders\**, *J. L. M. R. Leroy*, *L. De Keersmaecker*, *P. E. J. Bols*, and *W. F. A. Marei* (Abstract 2)
- 11:30 – 11:45 Effect of feeding rumen-protected choline around the peri-conceptual period on plasma choline metabolites and pregnancy rate in beef cows  
*M. Sagheer\**, *M. L. Haimon*, *D. Heredia*, *F. Tarnonsky*, *M. Venturini*, *A. Gonella-Diaza*, *N. DiLorenzo*, *J. W. McFadden*, and *P. J. Hansen* (Abstract 3)
- 11:45 – 12:00 Oxygen concentrations alter histone lactylation levels in bovine pre-implantation embryos  
*J. V. A. Silva\**, *J. Ispada*, *A. M. Fonseca, Jr.*, *E. C. Dos Santos*, *P. K. Fontes*, *H. C. Rocha*, and *M. P. Milazzotto* (Abstract 4)
- 12:00 – 12:15 Extracellular vesicles miRNAs from the oviduct and uterus modulate signaling pathways related to bovine early embryo development  
*R. Mazzarella\**, *C. L. V. Leal*, *K. Cañón-Beltrán*, *Y. N. Cajas*, *A. Gutiérrez-Adán*, *E. M. González*, *J. C. da Silveira*, and *D. Rizos* (Abstract 5)
- 12:15 – 12:30 Development of a new method to label pig oocytes with nanoparticles to be applied in assisted reproductive techniques  
*G. Garrappa\**, *G. Yarza-Muñoz*, *C. Luongo*, *F. A. García-Vázquez*, and *M. Jiménez-Movilla* (Abstract 6)
- 12:30 – 13:30 HASAC IETS Manual Subcommittee Meeting (ICA)
- 12:30 – 14:00 Lunch Break
- 12:30 – 14:00 IETS Committee Luncheon with Partner Society (Chincha)
- 12:30 – 14:00 Morulas and Mentor Lunch (Cusco 3)

## Session II: Great things start small – Building competent gametes (Limatambo 4, 5)

*Session co-chairs: Dimitrios Rizos, Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria, and Daniel Angel-Vélez, Ghent University*

- 14:00 – 14:45 Intra and intercellular signals governing sperm maturation  
*Clémence Belleannée, Université Laval, Canada*
- 14:45 – 15:30 Non-invasive assessment of oocyte developmental competence  
*Kylie Dunning, University of Adelaide, Australia*
- 15:30 – 16:00 Refreshment Break/Poster Viewing and Exhibits (Limatambo 1, 2, 3)
- 16:00 – 16:45 Selected short presentations
- Co-incubation with extracellular vesicles from follicular fluid of the breeding season improves the developmental competence of buffalo oocytes collected during the non-breeding season  
*M. Kosior*, *M. Benitez Mora*, *R. Esposito*, *F. Piscopo*, *M. Alfano*, *G. Albero*, *E. Capra*, *A. Lange Consiglio*, and *B. Gasparrini\** (Abstract 225)
- Delivery of exogenous sperm microRNAs increases cleavage rates and change gene expression in embryos leading an increment on blastocyst and development rates in low IVP fertility bulls  
*T. Hamilton*, *C. Mendes*, *J. Silveira*, *M. Goissis*, and *M. Assumpcao\** (Abstract 59)
- Efficacy of eCG-like on follicular dynamics and pregnancy rate in Nelore cows submitted to FTAI  
*L. Angelo de Abreu\**, *L. Cutaia*, *S. Perez Wallace*, *T. Santos Resende*, *A. Luiz Mancini Carreira*, *B. de Sa Cunha*, *A. Victoria Goncalves de Sousa*, *L. Alves da Silva*, *B. Lima Chechin Catussi*, and *P. Sampaio Baruselli* (Abstract 189)
- 16:45 – 17:15 **Distinguished Service Award** (Limatambo 4, 5)
- 17:15 – 18:30 Welcome Reception (Limatambo 1, 2, 3)

18:45 – 20:00 Student Mixer (Cusco 3)

## Wednesday, January 18

07:00 – 08:00 Organizational Breakfast Meeting of the IETS Foundation (Chincha)

08:00 – 17:00 Exhibits (Limatambo 1, 2, 3)

### Session III: Settled in for the long run – Pregnancies and where they take the wrong turn (Limatambo 4, 5)

*Session co-chairs: Katrin Hinrichs, University of Pennsylvania, and Renata Blocher, Utah State University*

08:00 – 08:45 Lethal variants of equine pregnancy: Is it the placenta or fetus leading the conceptus in the wrong direction?

*Amanda de Mestre, Royal Veterinary College, University of London, United Kingdom*

08:45 – 09:30 Decisive points for pregnancy losses in beef cattle

*Ky Pohler, Texas A&M University, USA*

09:30 – 10:00 **IETS Business Meeting** (Limatambo 4, 5)

10:00 – 12:00 **Poster Session I** (Limatambo 1, 2, 3)

10:00 – 12:00 Exhibits (Limatambo 1, 2, 3)

12:00 – 13:30 Lunch Break

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

12:00 – 13:30 Data Retrieval Committee Meeting Luncheon (ICA)

12:00 – 13:30 Morulas Career Luncheon (Cusco 3)

### Session IV: All in the details – Molecular prerequisites for the future (Limatambo 4, 5)

*Session co-chairs: Flavio Meirelles, University of São Paulo, and Isabel Gimeno Miquel, SERIDA*

13:30 – 14:15 Metabolism-epigenetic interactions on *in vitro*-produced embryos

*Marcella Pecora Milazzotto, Federal University of ABC–Brazil*

14:15 – 15:00 Genomic selection in beef cattle creates additional opportunities for embryo technologies to meet industry needs

*Stephen Miller, AGBU, a joint venture of NSW Department of Primary Industries and University of New England, Australia*

15:00 – 15:30 **Peter Farin Trainee Award Winners Presentations** (Limatambo 4, 5)

*Chair: Nisar A. Wani, Reproductive Biotechnology Centre*

Saurav Ranjekar, University of Connecticut

Patricia Fontes, Federal University of ABC

Alejandro de la Fuente, University of California, Davis

Miruna Munteanu, University of Saskatchewan

Shilpa Doultani, Gujarat University

15:30 – 16:00 Refreshment Break/Poster Viewing and Exhibits (Limatambo 1, 2, 3)

### Concurrent Forum

16:00 – 18:00 Practitioners' Forum (Limatambo 4, 5)

*Co-chairs: Carolina Herrera, Clinic for Reproductive Medicine, Vetsuisse, University of Zurich, and Gabriel Bo, Instituto De Reproducción Animal Córdoba*

Reducing pregnancy losses in an OPU-IVP program

16:00 – 16:20 Influence of oocyte quality on pregnancy losses

*Daniela Demetrio, RuAnn Genetics, USA*

16:20 – 16:40 How does an IVF laboratory management affect pregnancy loss?  
*Hanna Grothmann, Masterrind GmbH, Germany*

16:40 – 17:00 Recipient management in an OPU-IVF program  
*Alvaro García-Guerra, The Ohio State University, USA*

17:00 – 18:00 Questions and Discussion

### Concurrent Forum

16:00 – 18:00 Companion Animals, Non-Domestic and Endangered Species (CANDES) (Cusco 1, 2)  
*Chair: Dragos Scarlet, Vetsuisse Faculty Zürich, Switzerland*

16:00 – 16:45 Neuroendocrine control of ovulation in South American camelids  
*Rodrigo Carrasco, University of Saskatchewan, Canada*

16:45 – 17:00 Isolation and *in vitro* induction into pluripotency of adult camelid (*Lama glama*) fibroblasts  
*Nayanne Sant Clair Cardoso da Silva, University of São Paulo, Brazil*

17:00 – 17:15 Machine learning-aided ultrasonography for assessing follicular status in an endangered Anuran  
*Li-Dunn Chen, Mississippi State University, USA*

17:15 – 17:30 A transcriptomic quest to untangle equine oocyte maturation  
*Alejandro de la Fuente -Lara, University of California, Davis, USA*

17:30 – 17:45 Regions of the oviduct of creole turkeys hen, with and without sperm storage tubules, secrete extracellular vesicles, according to tissue, reproductive status and origin of collection (*in vivo-in vitro*)  
*Makarena Aurora Rubilar Quezada, Universidad de Concepción, Columbia*

17:45 – 18:00 Closing Remarks

18:00 – 19:30 HASAC Open Meeting (Limatambo 4, 5)

18:00 – 19:30 Morulas Forum (Cusco 1,2)

## Thursday, January 19

07:00 – 08:00 Organizational Meeting of the IETS Board of Governors (Chincha)

08:30 – 13:00 Commercial Exhibits (Limatambo 1, 2, 3)

### Session V: Where ends meet – R(a)ising of the next generation (Limatambo 4, 5)

*Session co-chairs: Daniela Demetrio, RuAnn Genetics, and Alejandro de la Fuente, University of California, Davis*

08:00 – 08:15 Morulas Presentation  
*Morgan Orsolini, University of California, Davis, USA*

08:15 – 09:30 Selected Oral Presentations

Does the impact of obesity on murine oocyte metabolic activity depend on the diet of the previous generation?  
*I. Xhonneux\*, W. F. A. Marei, P. E. J. Bols, and J. L. M. R. Leroy (Abstract 67)*

Extracellular vesicles secreted by bovine embryos during the hatching period induce the expression of nonclassical interferon-stimulated genes in endometrial cells  
*C. Aguilera\*, V. Alejandra, W. Yat, G.-R. Miguel, M. B. Bárbara, C. Diego, C. Fidel Ovidio, and R.-A. Lleretny (Abstract 85)*

A single cell atlas of bovine peri-implantation embryo development  
*G. Scatolin\*, Y. Wang, L. Zhu, E. Gutierrez-Castillo, and Z. Jiang (Abstract 92)*

Laser-assisted bovine embryo biopsy: Efficiency of the whole genome amplification and embryo development of *in vivo* bovine embryos in a selected breeding program

*G. Gamarra\*, N. Picard-Hagen, and S. Lacaze (Abstract 120)*

Effect of circulating progesterone concentration on the day of embryo transfer on fetal development and calf birth weight

*M. B. Rabaglino, J. M. Sánchez, A. D. Crowe, M. McDonald, E. O'Callaghan, S. G. Moore, S. T. Butler, and P. Lonergan (Abstract 231)*

09:30 – 10:15 Programming effects of late gestation heat stress in dairy cattle  
*Geoffrey Dahl, University of Florida, USA*

10:15 – 12:15 **Poster Session II** (Limatambo 1, 2, 3)

12:15 – 13:30 Lunch Break

12:15 – 13:30 2023, 2024, 2025 IETS Program Committee Lunch (Chincha)

13:30 – 16:00 Commercial Exhibit and Poster Takedown (Limatambo 1, 2, 3)

13:45 – 14:15 **Pioneer Award** (Limatambo 4, 5)

### **Session VI: George E. Seidel, Jr. Keynote Lecture (Limatambo 4, 5)**

14:15 – 15:00 Sperm RNA-mediated epigenetic inheritance in mammals: Challenges and opportunities  
*Qi Chen, University of California, Riverside, USA*

### **Awards Presentation and Updates (Limatambo 4, 5)**

#### **IETS Foundation Awards**

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

15:00 – 15:25 Early Career Achievement Award (Scientist)  
*Zongliang Jiang, University of Florida, Gainesville, USA*

15:25 – 15:50 Early Career Achievement Award (Practicing Professional)  
*Siddhartha Shankar Layek, National Dairy Development Board (NDDB), Anand, India*

15:50 – 16:05 IETS Foundation Student Competition Awards  
CSIRO Publishing Poster Competition  
*Chair: Jennifer Kelly, University of Adelaide*

Undergraduate Student Poster Competition  
*Chair: Paula Tribulo, CONICET-IRAC-UNC*

Graduate Student Research Competition  
*Chair: Paula Tribulo, CONICET-IRAC-UNC*

16:05 – 16:20 CANDES, DABE, and HASAC updates

16:20 – 16:30 Closing Ceremony (Limatambo 4, 5)

20:00 – 02:00 Closing Party, La Candelaria

# The Program Co-Chairs Acknowledge and Thank the Following People

## Section Editors

Paula Tribulo, *Graduate Student Competition*  
Pierre Comizzoli, *Bioethics, Welfare, and Sustainability*  
Alvaro Garcia-Guerra, *Case Reports and Field Data*  
Daniel Salamone, *Cloning/Nuclear Transfer*  
Barbara Durrant, *Companion CANDES*  
Matthew Wheeler, *Cryopreservation /Cryobiology*  
Kun Zhang, *Developmental Biology*  
Pat Lonergan, *Early Pregnancy*  
Jeremy Block, *Embryo Culture*  
Bradford Daigneault, *Embryo Manipulation*  
Peter Hansen, *Embryo Transfer*  
John Bromfield, *Epidemiology/ Diseases*  
Fulvio Gandolfi, *Fertilization/ICSI/Activation*

Marc-André Sirard, *Folliculogenesis/Oogenesis*  
Pablo Ross, *Genetic Engineering*  
Jane Morrell, *Male Physiology*  
Charles Rosenkrans, *Oestrus Synchronization/Artificial Insemination*  
Dimitrios Rizos, *Oocyte Collection*  
Anna Denicol, *Oocyte Maturation*  
Pascale Chavatte-Palmer, *Periconceptual/Fetal Programming*  
Tiziana Brevini, *Stem Cells*  
George Perry, *Superovulation*  
Paula Tribulo, *Undergraduate Poster Competition*

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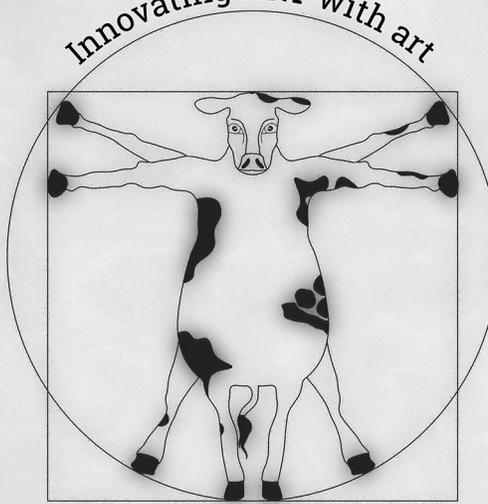
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# Poster Session Information

The size of your poster should be 36 inches (92 centimeters) wide and 48 inches (122 centimeters) tall. **The posters cannot be any wider than 36 inches. The posters can be taller if you need to expand, up to 60 inches tall.** We have different boards this year and you will not be able to have posters wider than 36 inches.

The poster materials may be affixed with tape. You must stay within these poster parameters.

## Location

Posters are located in the Limatambo 1, 2, 3 of the Westin Lima Hotel & Convention Center on the third floor (see map on page 6).

## Setup

Please check your poster number before posting. Odd-numbered posters will include a designation of S1 for Poster Session I, and even-numbered posters will include a designation of S2 for Poster Session II.

**Odd-numbered posters** and the student competition finalist and the undergraduate finalist poster presentations can be put up from 13:00 to 17:00 on Monday, January 16, and from 06:30 to 08:00 on Tuesday, January 17.

**Even-numbered posters** can be put up after 13:00 on Wednesday, January 18.

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

## Poster Session I

**Presentations by authors of odd-numbered abstracts** (e.g., 7, 9, 11) in *Reproduction, Fertility and Development* 2023; 35(1-2), as well as the student competition finalist and undergraduate finalist poster presentations will take place from 10:00 to 12:00 on Wednesday, January 18. Odd-numbered posters will be judged for the poster competition from 10:00 to 12:00 on January 18.

## Poster Session II

**Presentations by authors of even-numbered abstracts** (e.g., 8, 10, 12) in *Reproduction, Fertility and Development* 2023; 35(1-2) will take place from 10:00 to 12:00 on Thursday, January 19. Even-numbered posters will be judged from 10:00 to 12:00 on January 19.

## Teardown

Odd-numbered posters must be removed between 12:00 and 13:00 on Wednesday, January 18. Posters that are not taken down by 13:00 will be discarded. Poster teardown for the even-numbered posters will take place from 13:00 to 16:00, Thursday, January 19. Posters that are not taken down by 16:00 will be taken down and discarded.

# Poster Session Order by Topic

Poster number = abstract number in *Reproduction, Fertility and Development* 2023; 35(1-2)

## Graduate Student Competition Finalists

- 1 Culture with choline chloride programs development of the *in vitro*-produced bovine embryo to increase postnatal bodyweight, growth rate, and testes size  
*M. L. J. Haimon, E. Estrada-Cortés, T. F. Amaral, S. Jeensuk, J. Block, D. Heredia, M. Venturini, C. Santos Rojas, A. Gonella-Diaza, N. DiLorenzo, and P. J. Hansen*
- 2 Inhibition of mitochondrial ATP production during *in vitro* maturation of bovine oocytes alters DNA methylation patterns in mature oocytes and resulting embryos  
*B. Meulders, J. L. M. R. Leroy, L. De Keersmaecker, P. E. J. Bols, and W. F. A. Marei*
- 3 Effect of feeding rumen-protected choline around the periconceptual period on plasma choline metabolites and pregnancy rate in beef cows  
*M. Sagheer, M. L. Haimon, D. Heredia, F. Tarnonsky, M. Venturini, A. Gonella-Diaza, N. DiLorenzo, J. W. McFadden, and P. J. Hansen*
- 4 Oxygen concentrations alter histone lactylation levels in bovine preimplantation embryos  
*J. V. A. Silva, J. Ispada, A. M. F. Junior, E. C. Dos Santos, P. K. Fontes, H. C. Rocha, and M. P. Milazzotto*
- 5 Extracellular vesicles' miRNAs from the oviduct and uterus modulate signalling pathways related to bovine early embryo development  
*R. Mazzarella, C. L. V. Leal, K. Cañón-Beltrán, Y. N. Cajas, A. Gutiérrez-Adán, E. M. González, J. C. da Silveira, and D. Rizos*
- 6 Development of a new method to label pig oocytes with nanoparticles to be applied in assisted reproductive techniques  
*G. Garrappa, G. Yarza-Muñoz, C. Luongo, F. A. García-Vázquez, and M. Jiménez-Movilla*

## Case Reports and Field Data

- 7 First alpaca offspring produced from a demi-embryo  
*D. Ponce-Salazar, M. Miguel-Gonzales, M. Asparrin-Tapia, C. R. Youngs, and H. W. Vivanco-Mackie*
- 8 First twin lambs produced from demi-embryos in the high Andes of Peru  
*C. Pantoja Aliaga, D. Ponce-Salazar, M. Miguel-Gonzales, W. Bermúdez, E. Morales, D. Pariona, and H. W. Vivanco-Mackie*
- 9 *In vitro* production of Charolais cattle embryos in the south-central Amazonian region of Ecuador  
*D. E. Argudo, J. C. Durán, C. A. Soria, H. Hernández-Fonseca, and F. P. Perea*
- 10 Effect of lunar cycle on oocyte quality, rate of cleavage, and *in vitro* blastocyst production in cows  
*H. J. Hernandez-Fonseca, H. Zerpa-Gonzalez, R. Rezende, F. Machado, C. Nogueira, and F. P. Perea*
- 11 The impact of multiple ovum pickups on reproductive and productive performance of Holstein heifers  
*M. Oliveira, R. Reis Silva, J. Fonseca, R. Santos, and D. Demetrio*
- 12 Relationship between Angus oocyte quality and embryo production  
*D. Demetrio, M. Oliveira, R. Reis Silva, D. Amorim, C. Demetrio, and R. Santos*
- 13 Is pregnancy failure still a major concern for bovine *in vitro*-produced embryos?  
*R. Reis Silva, D. Demetrio, C. Walhof, M. Oliveira, J. Spricigo, and R. Santos*

- 14 Effect of breed on oocyte recovery and embryo production following ovum pickup and fertility outcomes after transferring fresh *in vitro*-produced embryos  
*G. Lamberti, H. Sadeghi, M. Fernandes, S. Filho, J. Marchizeli, R. Knychala, M. Lucy, and J. Moraes*
- 15 Pregnancy loss until 120 days of Nellore clone pregnancy  
*L. A. Bock, R. Rumpf, G. P. Cadima, and R. M. Santos*
- 16 Sperm morphology in frozen-thawed bull semen: Dairy versus beef and the effect of sire's genotype  
*L. Navarro, B. Vargas, and J. Chacón*
- 17 Comparison of two methods to evaluate sperm morphology in bulls and their effect on the breeding soundness classification  
*E. Chavarría, B. Vargas, and J. Chacón*

## Cloning/Nuclear Transfer

- 18 Hybrid lamb of domestic sheep and argali produced by somatic cell nuclear transfer  
*G. N. Singina, E. N. Shedov, R. Y. Chinarov, V. A. Lukanina, S. V. Pozyabin, N. I. Shumakov, O. V. Cherkasova, V. A. Bagirov, I. V. Gucev, G. Brem, and N. A. Zinovieva*
- 19 Exploring the expression of protamine 1 as a “xeroprotectant” in somatic cell nuclear transfer using sheep freeze-dried adult fibroblast  
*L. Palazzese, P. Loi, and M. Czernik*
- 20 Birth of myostatin-edited calf generated by cloning using CRISPR-Cas9 protein technology  
*M. Suvá, J. Bastón, V. Arnold, E. Wiedenmann, R. Jordan, L. Moro, and G. Vichera*
- 21 Quantification of mitochondrial DNA copy number in interspecies somatic cell nuclear transfer embryos  
*L. Adams, Y. Liu, B. Durrant, C. Young, E. Ruggeri, R. Krisher, T. Patrick, and I. Polejaeva*
- 22 Establishment, characterisation, and validation of novel porcine embryonic fibroblasts as a potential source for genetic modification  
*C.-H. Park, Y.-H. Jeoung, L. Zhang, S. G. R. Yeddula, K.-E. Park, J. Waters, and B. Telugu*

## Companion CANDES

- 23 Nuclear and cytoskeletal analysis of southern white rhinoceros (*Ceratotherium simum simum*) arrested presumptive zygotes following intracytoplasmic sperm injection  
*E. Ruggeri, C. Young, N. Ravida, and B. Durrant*
- 24 Cross-species transcriptomic analysis of mural granulosa cells between the southern white rhinoceros, human, and cattle  
*E. Ruggeri, K. Klohonatz, M. Korody, M. Sirard, and S. Coleman*
- 25 Biobanking the veiled chameleon (*Chamaeleo calypttratus*); investigation of sperm cryopreservation protocols  
*C. Young, N. Ravida, E. Gati, F. Mazzotti, and B. Durrant*
- 26 Influence of reproductive status on oocyte collection and *in vitro* embryo production in bison  
*M. Zwiefelhofer, E. Zwiefelhofer, E. Macquisten, J. Singh, G. Mastromonaco, and G. Adams*
- 27 Timing of physiological and behavioural oestrous following gonadotrophin treatment in polar bears  
*E. Curry, E. Donelan, D. Sabo, N. Smith, and T. Roth*

- 28 Limited availability of L-carnitine in the preovulatory follicle promoted by obesity can be restored by diet supplementation in mares  
*G. Catandi, K. Fresa, A. Chicco, and E. Carnevale*
- 29 The *in vitro* culture of domestic cat embryos without zona pellucida increases the expression of *YAPI* and *EOMES* at the blastocyst stage  
*D. Veraguas-Dávila, D. Saéz-Ruiz, M. C. Álvarez, F. Saravia, F. O. Castro, and L. Rodríguez-Alvarez*
- 30 Effects of exogenous oxytocin on semen characteristics in banteng (*Bos javanicus*) and lowland anoa (*Bubalus depressicornis*)  
*J. D. Gillis, L. Yon, and L. M. Penfold*
- 31 Chytridiomycosis reduces sperm production in young southern corroboree frogs  
*P. Frias-Álvarez, R. Webb, L. Brannelly, K. R. Woodley, L. F. Skerratt, L. Berger, and D. B. B. P. Paris*
- 32 Challenges and considerations for biobanking for zoos and aquaria: A mammoth undertaking  
*L. Penfold, B. Pukazhenthii, and S. Lavin*
- 33 Cryopreservation of Jamaican fruit bat (*Artibeus jamaicensis*) spermatozoa  
*E. Xiao-Kim, T. Shountz, J. Graham, and J. Barfield*
- 34 Sperm kinetic subpopulations in samples from Angus and Holstein bulls vary differentially in a longitudinal assay  
*E. Teran, Y. Pirosanto, P. Tribulo, M. Ramon, A. Antonini, A. Molina, and S. Demyda-Peyrás*
- 35 Inter- and intra-stallion analysis of the kinematic sperm subpopulations in fresh ejaculates of Pura Raza Española horses  
*Y. Pirosanto, E. Teran, A. Molina, J. Lavitola, and S. Demyda-Peyrás*
- 36 Evaluating the toxicity of several sperm diluents over time and at varying osmolalities in an internally fertilising salamander species  
*D. Chen, C. Kouba, and A. Kouba*

## Cryopreservation/Cryobiology

- 37 Survival rate of immature oocytes postcryopreservation by solid surface vitrification, conventional straw vitrification, or conventional slow-freezing method  
*M. L. Mphaphathi, S. M. Sithole, M. D. Sebopela, M. R. Ledwaba, M. A. Thema, T. L. Magopa, H. A. O'Neill, and T. L. Nedambale*
- 38 Protective effect of glutathione concentrations on cryopreserved Kolbroek boar sperm  
*L. D. Sehlabela, M. L. Mphaphathi, T. R. Netshirovha, and T. L. Nedambale*
- 39 The effect of supplementation of different concentrations of dithiothreitol and glutathione on post-thawed semen from Large White boars  
*M. R. Ledwaba, M. L. Mphaphathi, M. A. Thema, C. M. Pilane, and T. L. Nedambale*
- 40 L-carnitine protects membrane functionality of boar spermatozoa  
*M. Lagares, F. Anselmo, M. Oliveira, R. Wenceslau, and R. Stahlberg*
- 41 Vitrification of bovine *in vitro*-produced embryos: Can it replace slow freezing in bovines?  
*A. V. Bharti, S. S. Layek, S. Raj, S. Gorani, and S. Doultani*
- 42 Differential effects of vitrification and slow freezing on mitochondrial respiratory properties after thawing of expanded bovine blastocysts  
*M. Hoelker, D. Salilew-Wondim, F. Rings, D. Miskel, E. Tholen, C. Blaschka, and J. Kurzella*

- 43 Resveratrol during the warming process improves the quality of *in vitro*-produced vitrified embryos of Hartón del Valle cattle  
*J. C. Escobar, D. Maturana, R. Campos, R. Urrego, and V. Torres*
- 44 Assessment of quality and fertilising ability of dog epididymal spermatozoa frozen or vitrified with L-carnitine by heterologous IVF  
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## Recipient of the 2023 IETS Distinguished Service Award



### Sudharma (Sue) Leelawardana

#### Early Career in Sri Lanka

Dr. Sudharma (Sue) Leelawardana was born in Sri Lanka, where she completed her veterinary degree from the University of Peradeniya. She commenced her veterinary career as a government veterinarian in the Sri Lankan Department of Animal Production and Health. It was a mixed bag of veterinary work, which included veterinary care for production and pet animals, as well as implementation of animal sector government policy (specifically in animal reproduction and nutrition). Her work was based in rural Sri Lanka. Working in this environment helped Dr. Leelawardana to realize the importance of animal reproduction to improve the local livestock breeds, which had to survive and reproduce on low-quality animal feed available to rural farmers.

In 1984, she married her husband, Don, who was also a veterinarian.

#### A Big Move to Australia

In 1988, Dr. Leelawardana completed a master's degree, sponsored by the Food and Agriculture Organization, at the Asian Institute of Technology in Bangkok, Thailand. On her return to Sri Lanka, she undertook the role of adviser to policy makers. In this role, she continued her work to improve the native cattle breeds through selective reproduction.

In December 1988, Dr. Leelawardana and her husband moved to Australia on a skilled migration program. Soon after that, she had her only child, Suellan, in Perth, Western Australia. While caring for the baby, she successfully undertook the daunting process of getting her veterinary qualifications recognized in Australia. This helped her commence her career as a veterinarian in Australia in the Australian Quarantine and Inspection Service (AQIS) in 1996. During her time with AQIS, she completed her membership in the Australian and New Zealand College of Veterinary Scientists (ANZCVS) in 1998. Recently she was made a "life member" of ANZCVS.

#### Specialization in Animal Health Risk Analysis

Over the years, Dr. Leelawardana developed an interest in Animal Health and Food Safety Risk Analysis and in 2000, she completed her training at the Royal Veterinary and Agriculture University in Copenhagen, Denmark, in qualitative risk analysis (animal health and food safety).

In 2001, Dr. Leelawardana and the family moved to Canberra head office of the Australian Department of Agriculture and Water Resources. This is where she became heavily involved in animal health risk assessments, particularly import risk assessments of animal reproduction material. In 2003, she gained competency in quantitative risk analysis for animal health and food safety in France, under Dr. David Vose. Soon after that, she completed a post graduate program in Veterinary Epidemiology and Public Health at Royal Veterinary College of London.

#### Further Work in Reproduction with IETS and a Move to New Zealand

Dr. Leelawardana's risk assessment work with the Australian Department of Agriculture and Water Resources paved the way for the importation of bovine *in-vitro* embryos into Australia, from the United States and Canada. During this process she visited embryo collection and production facilities in the United States and Canada. At that time, she attended her first-ever IETS conference and Health and Safety Advisory Committee (HASAC) meeting in 2016 in Kentucky.

Dr. Leelawardana also helped reopen the Australian market for the exportation of semen and *in vivo* embryos to the United States and Canada by negotiating animal health conditions for Australian ruminant reproductive material, which opened new markets for these products from Australia to various countries, including some in South America and the European Union.

During this time, she started attending the HASAC Committee meetings and the IETS conferences in the United States annually. In 2017, she joined the Ministry of Primary Industries in New Zealand as the Manager of the Animal Risk Assessment team. Although she did not attend the conference in Thailand in 2017, she took over the duties of Dr. Francis Fieni as the Chair of the IETS Manual Subcommittee in 2018. She worked with IETS members and Board of Governors to update the 4th edition of IETS Manual. She maintains this position to date.

### **A Happy Retirement in Australia**

Sue moved back to Australia in November 2022, due to family commitments. She is now retired and lives with her husband in Melbourne, Australia. She has continued to work on the IETS Manual with various specialists in the embryo technology. She hopes to continue her work in veterinary epidemiology, qualitative and quantitative animal health and food safety risk assessments, and reproduction in the future.



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# Special Events

## Preconference Virtual Workshop, Module 1

Sunday, January 15

13:50 – 18:45

Virtual Meeting

Advances in Reproductive Technologies in Camelids

This virtual event will comprise five lectures that will describe topics related to recent advances in the study of reproductive technologies in the South American camelids and the old-world camelids. The speakers that will be given the lectures are Dr. Julian Skidmore, Dr. Wilfredo Huanca, Dr. Jane Vaughan, Dr. Alexei Santiani, and Dr. Gregg Adams. The talks will be given in English with simultaneous translation to Spanish. **Additional registration fee required.**

## Preconference Workshop, Module 2

Monday, January 16

Facultad de Medicina Veterinaria (FMV)

Universidad Nacional Mayor de San Marcos (UNMSM)

07:30 – 18:15

Advances in Reproductive Technologies in Camelids

This event will comprise four concurrent wet lab sessions of around two hours each. Each session will consist in the demonstration of one reproductive technology in alpaca which will include two or three specific activities. Each attendee will participate in all of the sessions throughout the day. This event will be held at the Facultad de Medicina Veterinaria, Universidad Nacional Mayor de San Marcos, Lima (six kilometers from the Westin Lima Hotel). Transportation will be provided by the FMV to all participants from the Westin Hotel to the venue. The bus will bring back the participants to the Westin Hotel after finishing the wet lab. **Additional registration fee required.**

## DABE Preconference

Modeling embryo function in vitro: the era of synthetic embryos

Monday, January 16

09:00 – 18:30

Cusco 1, 2

The workshop will start with a talk from Dr. Yun Wu about his incredible work, “The use of blastoids for studying embryo development.” Dr. Wu’s talk will be followed by another great talk from Dr. Jakob Hanna, titled “Extended embryo culture: from pre-gastrulation to late organogenesis.” To finish our workshop, we will have a lively roundtable on “The perspectives of using synthetic/in vitro modelled embryos in practice,” which will be moderated by Dr. Paula Rodriguez and Dr. Cody Kime. We encourage our practitioner members to attend our pre-conference, as we would like to hear your perspectives on the use of synthetic embryos in practice and together with our researchers’ perspectives, have a discussion that will be interesting for all IETS members. **Additional registration fee required.**

## IETS Health and Safety Advisory Committee Preconference Symposium

Monday, January 16

08:50 – 17:00

Limatambo 4, 5

***Media news or new media—How safe are in vitro-produced embryos for international trade?***

It was a little over 40 years ago when a cow gave birth to the first calf produced from *in vitro* fertilization. Since then, research has resulted in enormous advances in the production of *in vitro*-produced (IVP) embryos, more so in recent years in North and South America and in Europe with the advent of sexed semen and genomic selection. Fine tuning of nutrition and environment of the *in vitro* oocyte maturation and embryo culture processes has significantly reduced the risks of physiological and anatomical defects and has thus created opportunities for safe domestic and international

trade in IVP embryos of livestock. Already, global production and transfer of bovine IVP embryos far exceed the collection and transfer of bovine *in vivo*-derived embryos. However, very little research has been done in managing the sanitary status of IVP embryos, in ensuring the negligible risks of disease/pathogen transmission via embryo transfer. Much of the early research is no longer applicable. New research is unlikely. Consequently, there has been relatively little progress in developing international trade, and consequently, less opportunities to develop advanced livestock breeding programs using the latest tested and proven technologies offered by IVP embryos.

**It is now time to explore alternatives to the conventional approach to assessing disease transmission risks in IVP embryos**, especially as, for livestock, co-culture cells and serum are no longer used for most commercial IVP embryo production. This symposium will highlight the recent advances in the sanitary processes involved in producing IVP embryos, and the experiences of IVP laboratory personnel, researchers and ET practitioners in managing possible disease transmission risks and explore the use of available ET datasets to assess these transmission risks. Experts will then propose recommendations for the safe, efficient, and effective trade in livestock IVP embryos. There will be opportunities for discussions and questions and answers. **Additional registration fee required.**

### **Morulas and Mentors Luncheon**

Tuesday, January 17

12:30 – 14:00

Cusco 3

*Sponsored by CSIRO Publishing*

One of the main goals of the Morulas is to provide trainees the opportunity to interact with the senior members of the IETS. The Morulas and Mentors Luncheon is designed to give trainees an opportunity to sit down with mentors in small groups, providing a chance to interact and develop a connection with leaders in our field. Trainees will have an opportunity to choose a mentor they would like to sit with, seating will be first come, first served. Three amazing mentors will join the lunch and share their wisdom with the Morulas, including Dr. Islam M. Saadeldin, South Korea. Dr. Saadeldin obtained his DVM and master's degree from Zagazig University, Egypt, and PhD degree from Seoul National University, South Korea. After his PhD, he worked as a postdoctoral researcher at Seoul National University. He was a visiting scholar at Niigata University, Japan, and an associate professor at King Saud University, Saudi Arabia. Currently, he is a research professor at Chungnam National University, South Korea, in addition to his tenured faculty position at Zagazig University. He has a patent of invention (The Korean Intellectual Property Office) regarding bovine embryo transgenesis through *piggybac* transposons and he authored more than 120 research papers, reviews, and book chapters covering the fields of advanced reproductive biotechnology such as somatic cell nuclear transfer, transgenesis, adult and embryonic stem cells, as well as elucidating the roles of extracellular vesicles in embryo communication and the embryonic-maternal crosstalk. In addition, he investigated the comparative cellular defense against extreme hyperthermia, and the relation with cellular anastasis, and cellular resilience. He current research focuses on developing CRISPR/Cas9 engineered extracellular vesicles for improving embryo implantation and pregnancy of cloned and transgenic animals. He has been awarded several national and international prizes, such as the Egyptian State Prize, Shoman Prize, Almarai Prize, Misr Elkheir Prize, and the Asian Universities Alliance Scholar Award. He served as an editorial board member for some journals and an ad-hoc reviewer, as well as a university teacher and science communicator. Dr. Amanda de Mestre, United Kingdom, will also speak. In 2008, Dr. de Mestre was appointed to faculty at the Royal Veterinary College, where she established her research program in the immunobiology of equine pregnancy and underlying mechanisms of pregnancy failure. As the principal investigator of the Equine Pregnancy Laboratory, her team currently works closely with epidemiologists, geneticists, and pathologists to take an interdisciplinary approach to identify and characterize novel causes of pregnancy loss both in early and late gestation. This has included the identification and characterization of autosomal aneuploidy in spontaneously occurring pregnancy loss in mares, characterization of microdeletions and duplications during placentation and definition of abortions that arise due to umbilical cord torsion. Dr. de Mestre was the recipient of the 2015 Society of Reproduction and Fertility New Investigator Award. She is the treasurer for International Society for Equine Reproduction, Associate Editor for Reproduction and Fertility, and recently completed her position as Council Member for the Society of Reproduction and Fertility. Dr. de Mestre is moving her laboratory to Baker Institute for Animal Health, Cornell University, in early 2023 to take up a professorship in the Department of Biomedical Sciences. **(Ticket required.)**

## Welcome Reception

Tuesday, January 17

17:00 – 18:30

Limatambo 1, 2, 3

*Sponsored by Professional Embryo Transfer Supply Inc. (PETS)*

A welcome reception will be held in the Limatambo 1, 2, 3 of the Westin Lima Hotel and Convention Center, from 17:00 – 18:30. Meet the exhibitors and renew old friendships. Light hors d'oeuvres will be served with a cash bar. This event is open to all registrants and guests. **(Don't forget to bring your drink tickets.)**

## Morulas' Student Mixer

Tuesday, January 17

18:30 – 20:00

Cusco 3

After business comes the fun! Shortly after the IETS Welcome Reception, all trainees are invited to gather with friends and drinks for a social event. Hosted by IETS, this annual event is a fun time for all trainees to relax and enjoy the atmosphere. Take advantage of meeting new people and establishing connections that last a lifetime. It is our pleasure to invite you all to the upcoming annual social event, the Morulas Mixer. We will all be gathering on Tuesday, January 17, at 18:30. We are excited to have an exclusive time set aside for trainee interaction. Some drinks will be provided. **(Registration and tickets are NOT required.)**

## IETS Business Meeting

Wednesday, January 18

09:30 – 10:00

Limatambo 4, 5

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

## Morulas Career Luncheon

Wednesday, January 18

12:00 – 13:30

Cusco 3

*Sponsored by CSIRO Publishing*

Trainees will have the opportunity to meet and interact with two fantastic speakers who will talk about their experiences, career paths, and decisions that have led them to their current position, either within the industry or academia. This year's career luncheon will feature a talk by two speakers who will share unique perspectives from their own professional journeys. We look forward to hearing the presentations from Dr. Lotte Bjørg Strøbech, of Stroebech Media, Denmark. Dr. Stroebech has been at the forefront of many significant advances within in vitro production of embryos with more than 20 years of experience in media development and protocol optimization. Having consulted and trained more than 300 laboratories worldwide to get established or improve their results, she is a true expert within the field. She is often invited speaker to breeder organization meetings throughout the world. Dr. Stroebech is a veterinarian with a PhD in veterinary physiology. She developed the media for IVF Bioscience UK, and she was their previous scientific advisor. Dr. Stroebech has in her capacity of associate professor at University of Copenhagen, supervised PhD and postdocs in IVP of embryos. She is a member of the Steering Group Committee of EliteOva, and partner in the research projects EliteSemen, Searmet, GIFT Brazil, was chairman of the board of the Danish Society of Reproduction and Fetal Development (DSRF) previous board member of AETE and currently board member at IETS. Dr. Jo Leroy, University of Antwerp, Belgium will present. Dr. Leroy is a ruminant veterinarian (2001) and did his PhD about the impact of the negative energy balance in dairy cows on reproductive physiology and on oocyte and embryo quality (Faculty of Veterinary Medicine, Ugent, Belgium). He collaborated in the ambulatory large animal clinic as a PhD and postdoctoral student. In fall 2006, Dr. Leroy moved to the University of Antwerp teaching veterinary physiology, pathophysiology, and husbandry. Furthermore, he has built his own research line focusing on the effect of maternal metabolic health on oocyte and embryo quality and on offspring's health. Dr. Leroy is president of the European Society of Embryo Technologies and advisor of industrial partners. He is the author of more than 150 peer-reviewed

scientific papers and supervised 15 PhD theses. Since January 2018, he is full professor at the University of Antwerp. **(Ticket required.)**

### **Practitioners' Forum**

Wednesday, January 18

16:00 – 18:00

Limatambo 4, 5

*Sponsored by Calier*

Ovum pick up and *in vitro* production (OPU-IVP) of bovine embryos are increasingly being used by different breeding programs around the world, with a steady growth in the number of embryos produced every year. Although progress in the efficiency of OPU-IVP has allowed the worldwide application of the technique, a correct management of the conditions at every stage is necessary to ensure a successful outcome. Embryo/fetal losses in an OPU-IVP program have a negative economic impact and are affected by several factors along the production pipeline. Among these factors, oocyte quality and developmental competence, quality control and laboratory conditions, and recipient synchronization and management are particularly relevant. The forum will concentrate on the discussions of these conditions and the objective is to come up with new ideas and potential ways to make significant improvements if the number of offspring produced per donor involved in OPU-IVP programs.

### **CANDES Forum**

Wednesday, January 18

16:00 – 18:00

Cusco 1, 2

CANDES will host a concurrent forum with a talk from Rodrigo Carrasco, University of Saskatchewan, on an update regarding neuroendocrine control of ovulation in South American camelids.

His talk will be followed by short presentations on llamas, anurans, horses and turkey.

### **Open Meeting of the Health and Safety Advisory Committee (HASAC)**

Wednesday, January 18

18:00 – 19:30

Limatambo 4, 5

### **Morulas Trainee Forum**

Wednesday, January 18

18:00 – 19:30

Cusco 1, 2

All trainees are invited to attend the Morulas Trainee Forum. The Morulas Board of Governors will welcome new members and explain our activities, encouraging active participation in the IETS. A summary of Morulas activities during 2022 will be presented, together with plans and perspectives for the future. All members have the opportunity to participate and express opinions or ideas. In addition, we will say goodbye to Governors Morgan Orsolini and Carolina Okada, who served on the Morulas Board of Governors for two years to grow and strengthen the trainee association. We will then officially welcome the newly elected governors to their two-year terms. This is a great time to get involved and discuss important events and opportunities for all trainees. **(Everyone is welcome.)**

### **IETS Awards Presentations and Updates**

Thursday, January 19

15:00 – 16:30

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

## IETS Closing Party

Thursday, January 19

20:00 – 02:00

La Candelaria

Put on your dancing shoes and join us for an evening filled with dancers, live music, good food and old and new friends. Bus transportation will be available for all attendees. Bus service will start at 19:15, departing from the Westin Hotel. Return bus service will begin at 22:00 and run until the last bus at 01:30. (Don't forget your drink tickets.) **Additional registration fee required.**

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## IETS Foundation 2023 Early Career Achievement Award (Scientist)



### Zongliang (Carl) Jiang

Carl Jiang received his PhD from University of Connecticut in 2015, was a Postdoctoral Associate at Yale School of Medicine, and then from 2017-2022, he worked as Assistant Professor, Associate Professor, and Doyle Chambers Distinguished Professor at Louisiana State University. Currently, he is an Associate Professor at the University of Florida and Member of UF Genetics Institute. His research interests are focused on understanding epigenetic mechanisms regulating pre- and peri-implantation development when most pregnancy losses occur. He was among the first to use RNA-seq, whole genome bisulfite sequencing, ATAC-seq and ribosome profiling methodologies to analyze the transcriptome, DNA methylome, chromatin accessibility and translome of gametes and preimplantation embryos from livestock species. Recently, he has reported success in establishing bovine trophoblast stem cells, and developing bovine blastocyst-like structures (blastoids) from cultured stem cells. Dr. Jiang's research has been supported by major funding sources including NIH R01 and USDA-NIFA awards. He has two patents regarding bovine blastoids and bovine trophoblast stem cells technologies. He has published 42 peer-reviewed papers including those published in *Development*, *PNAS*, and *Nature*. He is an Associate Editor of *Frontiers in Veterinary Science*, and has served as

three separate NIH review panels, one standing study section and two special emphasis panels.

### Previous Recipients

Islam M. Saadeldin (Scientist), 2022

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

Alejo Menchaca (Scientist), 2019

Kiho Lee (Scientist), 2018

Pablo J. Ross (Scientist), 2017

Todd Stroud (Practitioner), 2017

# IETS Foundation 2023 Early Career Achievement Award (Practicing Professional)

## Siddhartha Shankar Layek



Dr. Siddhartha Shankar Layek is presently working as Manager (Animal Breeding), National Dairy Development Board, Anand, India (NDDB, Anand) and largely responsible for operations of OPU-IVEP-ET facility and field ET. He is a veterinarian and completed master's degree and PhD in the field of livestock production and management with major focus on animal reproduction from National Dairy Research Institute, Karnal, India. He also received Fulbright Nehru Doctoral and Professional Research Fellowship and pursued his PhD research in Department of Animal Science, Cornell University, Ithaca, New York, USA. Apart from his tenure at Cornell, he was trained in OPU-IVEP-ET at EMBRAPA, Brazil, and Transova, USA.

NDDB established its laboratory to standardize the technology in cattle and buffaloes and to create a large trained manpower pool to drive the technology in India. Dr. Siddhartha played a pivotal role in establishing this laboratory and standardizing the procedures in the facility. The facility has lately craved "hub and spoke" model to popularize ET in marginal smallholder system of dairying in India. In this model, dairy cooperatives are playing the role of the spoke.

They are identifying recipients, synchronizing, detecting estrus, and finally, transferring the embryos, after obtaining training from NDDB. OPUs and production of embryos is happening at NDDB, which is acting as hub. They are presently working with the five biggest dairy cooperatives of India, including Amul, and expecting to create some impact within a few years.

Dr. Siddhartha acts as training manager for OPU-IVEP-ET trainings conducted by the facility. He is also supervising master's and PhD dissertation work in collaboration with neighboring universities, focusing on the challenges in implementation of the embryo transfer technology. Few of their works are getting presented in the 49th IETS Meeting.

He has been selected as a member of the central monitoring unit for IVF laboratories in India by the government of India. In this capacity, he is helping other IVF facilities funded by government to establish and grow through continuous guidance.

Presently Dr. Siddhartha is working on developing in-house media to reduce the cost of embryo production and an artificial intelligence-based embryo-grading software, which may help new practitioners. Apart from embryo biology, he also holds interest in bovine semen biology and is pursuing that interest by providing technical support to commercial semen production centers in India.

## Session Speakers and Keynote Biographies

### Jo Leroy



Jo Leroy is a ruminant veterinarian (2001) and did his PhD about the impact of the negative energy balance in dairy cows on reproductive physiology and on oocyte and embryo quality (Faculty of Veterinary Medicine, Ugent, Belgium). He collaborated in the ambulatory large animal clinic as a PhD and post-doctoral student.

In fall 2006, Leroy moved to the University of Antwerp to teach veterinary physiology, pathophysiology and husbandry. Furthermore, he has built his own research line focusing on the effect of maternal metabolic health on oocyte and embryo quality and on offspring's health. Leroy is president of the European Society of Embryo Technologies ([www.aete.eu](http://www.aete.eu)) and advisor of industrial partners. He is the author of more than 150 peer-reviewed scientific papers and has supervised 15 PhD theses. He has been a full professor since January 2018 (UAntwerp).

### Lawrence Reynolds



For his entire 44-year research career, Dr. Lawrence Reynolds has focused on “problems of pregnancy,” which have major socioeconomic and health implications for livestock and for humans as well. These problems of pregnancy include infertility (the inability to conceive and establish a pregnancy), poor pregnancy outcome (primarily reflected by low birthweight), and premature birth in livestock. Dr. Reynolds is a founding Director of the Center for Nutrition and Pregnancy and a University Distinguished Professor at NDSU. He has received the Animal Physiology and Endocrinology Award and the Animal Growth and Development Award, and he also is a Research Fellow of the American Society of Animal

Science. He is ranked in the upper 2.4% overall of top-cited researchers in the world (all STEM fields) and in the upper 0.3% of top-cited researchers in his primary field (dairy and animal sciences).

### Clémence Belleannée



Clémence Belleannée is an Associate Professor at Université Laval, Canada, researcher in reproductive biology at the CHU de Québec Research Center (CRCHUQ) since 2014 and the co-Director of the Center for Research in Reproduction, Development and Intergenerational Health (CRDSI). Her research focuses on the study of key intercellular interplays that sustain male reproductive physiopathology and fertility. The primary cilia cilium is an ubiquitous and conserved cellular organelle that controls cell proliferation, apoptosis and differentiation. While impairment of primary ciliary function is associated with multisystemic disorders and carcinogenesis, its contribution to male reproductive

health is being explored in only few laboratories worldwide, including ours. Over the past few years, her research group has been investigating the role of this cellular antennae in the homeostasis of hormone-responsive organs from the male reproductive system, including the efferent ductules, the epididymis, and more recently, the prostate. She secured funds and developed *in vitro/in vivo* models to unravel the role of sensory primary cilia in the control of epididymis functions and male fertility. Thanks to these achievements, they published 38 articles (total of 2,674 citations) and she has been awarded the Matthew P. Hardy Young Andrologist Award by the American Society of Andrology in 2021.

### Kylie Dunning



Dr. Kylie Dunning heads the Reproductive Success Group within the Robinson Research Institute at the University of Adelaide, Australia. She has made seminal and internationally renowned contributions to reproductive biology that have advanced fundamental knowledge in ovarian follicle development, oocyte maturation, and preimplantation embryo development. She is an emerging leader and trailblazer in transdisciplinary research, expanding her expertise to incorporate novel biophotonic tools, imaging platforms, and artificial intelligence to better understand the mechanisms underpinning healthy oocyte and early embryo development. Dr. Dunning's transdisciplinary expertise is best

illustrated by her multifaceted studies of embryo development and metabolism, in which she has uniquely capitalized on the use of advanced optical analyses to develop a non-invasive technology to diagnose the presence and location of aneuploid cells within the inner cell mass of the developing embryo. In recognition of research excellence, she has received numerous prestigious awards including the Newcastle Emerging Leader Award 2019 (Society for Reproductive Biology, AU/NZ), the 2020 South Australian Tall Poppy of the Year, and a 2022 Rising Star Award (Society for the Study of Reproduction, USA).

## Amanda De Mestre



Reader Reproductive Immunology, The Royal Veterinary College, University of London, United Kingdom

Dr. Mandi de Mestre is a Reader in the Department of Comparative Biomedical Sciences, at the Royal Veterinary College, London. She completed her clinical training [BVSc(hons)] at the University of Sydney, Australia, after which she worked as a clinician in the field of equine reproductive and neonatal medicine. She received a PhD in biomedical sciences in 2006 from the Australian National University.

Her postdoctoral training that followed was at Cornell University where she consolidated her research interests in equine pregnancy and genetics. In 2008, she was appointed to faculty at the Royal Veterinary College, where she established her research program in the immunobiology of equine pregnancy and underlying mechanisms of pregnancy failure. As the principal investigator of the Equine Pregnancy Laboratory, her team currently works closely with epidemiologists, geneticists, and pathologists to take an interdisciplinary approach to identify and characterize novel causes of pregnancy loss both in early and late gestation. This has included the identification and characterization of autosomal aneuploidy in spontaneously occurring pregnancy loss in mares, characterization of microdeletions, and duplications during placentation and definition of abortions that arise due to umbilical cord torsion. Dr. de Mestre was the recipient of the 2015 Society of Reproduction and Fertility New Investigator Award. She is the treasurer for International Society for Equine Reproduction and Associate Editor for *Reproduction and Fertility*, and she recently completed her position as Council Member for the Society of Reproduction and Fertility. Mandi is moving her laboratory to Baker Institute for Animal Health, Cornell University, in early 2023 to take up a professorship in the Department of Biomedical Sciences.

## Ky Pohler



Dr. Ky Pohler is an Associate Professor and Chair of the Pregnancy and Developmental Programming Area of Excellence in the Department of Animal Science. He grew up in Shiner, Texas, and received a BS in animal science from Texas A&M University. He then received a MS and PhD from the University of Missouri. Prior to returning to Texas A&M, Dr. Pohler was on faculty at the University of Tennessee in the Department of Animal Science. Dr. Pohler's research interest focus on understanding the physiological and molecular mechanisms that control reproductive efficiency in cattle. More specifically, his lab is interested in the mechanisms that lead to embryonic and fetal mortality in cattle and development

of management strategies to overcome these losses.

## Marcella Pecora Milazzotto



For over 15 years, Marcella Milazzotto has been a professor at the Federal University of ABC. Her research is focused on the network between metabolism and epigenetics during pre-implantation embryonic development, but she can also be credited with contributions to the creation of graduation and post-graduation programs in the field of biotechnology and the coordination of the Research Core in Sustainability in Agrobusiness. In 2020, she was honored with the award Researcher of the Year by the Brazilian Society of Embryo Technology for her contributions to the field of basic science in reproduction. She holds a master's in genetics and a PhD in biotechnology and currently lives in São Paulo, Brazil.

## Stephen Miller



Dr. Stephen Miller is Director of the Animal Genetics and Breeding Unit (AGBU), at the University of New England in Armidale, Australia. The AGBU is well known as a leading institute globally delivering practical genetic improvement tools to industry. Prior to this Dr. Miller was the Director of Genetic Research for Angus Genetics Inc. (AGI) in Saint Joseph, Mo. where he furthered the evaluation methods for the Association's weekly National Cattle Evaluation and AGI clients. Prior to joining AGI, Dr. Miller was a principal scientist with the animal genomics team at AgResearch Ltd. in New Zealand. Originally from Canada, Dr. Miller was on faculty at the University of Guelph for 14 years, where he finished as the Director of the Centre for Genetic Improvement of Livestock. The University of Guelph is also Dr. Miller's alma mater, where he completed his PhD in animal breeding and genetics in 1996 and his BSc (Agr.) in animal science in 1992. Dr. Miller has experience in genetic improvement across a range of species but is best known for his work in beef cattle and has 25 years of experience with livestock genetics, genomics, and technology.

## Geoffrey Dahl

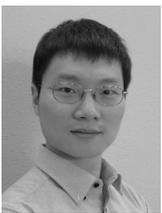


Geoffrey E. Dahl is the Harriet B. Weeks Professor in the Department of Animal Sciences at the University of Florida, Gainesville. He previously served as Chair of the department for 12 years, serving as liaison between the university, livestock producers, and allied industries in Florida. During his time as Chair, the department grew in faculty from 25 to 40 tenure track lines, increased from the bottom quartile to the top quartile in research funding, and increased undergraduate enrollment from 500 to over 600 students. In the most recent Center for World University Rankings, the University of Florida was ranked ninth in the world for dairy and animal science ([www.cwur.org/2017/s](http://www.cwur.org/2017/s)). Dr. Dahl has been invited to serve on a number of external programmatic and grant evaluation panels in the United States and abroad. He was active in development of the proposal that brought the USAID Livestock Systems Innovation Laboratory, a \$49 million project, to the Department of Animal Sciences at the University of Florida.

Dr. Dahl conducts applied and basic research with direct impact on dairy production. Specific research interests include effects of photoperiod manipulation on production and health, the impact of frequent milking in early lactation on milk production, and heat stress abatement during the dry period on cow and calf productivity and health. Those research efforts are disseminated through his Extension programming in the United States and abroad. Indeed, Dr. Dahl has been invited to present his research findings in 20 countries and has active Extension program efforts in a variety of developing countries including Sri Lanka, Nepal, Rwanda, and Ethiopia. Dr. Dahl has authored over 150 peer-reviewed papers and numerous symposium and popular press articles. He has trained 27 graduate students and post-doctoral fellows.

Dr. Dahl is a member of several professional and honorary societies including the American Dairy Science Association (ADSA), the American Society of Animal Science, the Society for the Study of Reproduction, American Association for the Advancement of Science (AAAS), and the Endocrine Society. He served as President of ADSA from 2018 to 2019. Geoff has received numerous awards including the Award of Honor from ADSA and is a Fellow in AAAS.

## Qi Chen



Dr. Chen was trained as a reproductive and developmental biologist, applying physiological and genetic approaches to study spermatogenesis, sperm behavior, embryo development, and implantation using mouse models. Dr. Chen's current research focused on the hereditary information carried by sperm beyond DNA sequence. His team showed that paternally acquired phenotypes (e.g. metabolic disorders) from environmental stressors can be encoded in the form of sperm RNAs and RNA modifications as a "sperm RNA code," which confer paternal phenotypes to the offspring via shaping early embryo development. His ongoing research focused on addressing how the tRNA-derived small RNAs (tsRNAs) and rRNA-derived small RNAs (rsRNAs) in the sperm respond to environmental stimuli and how tsRNAs/rsRNAs regulate the trajectory of early embryonic development. His group also developed novel analytical tools to facilitate the study of emerging small RNAs such as tsRNAs/rsRNAs and their RNA modifications, and have begun to harness these information for intergenerational prevention of diseases susceptibilities and to develop novel biomarkers such as the non-invasive diagnosis of diseases.

Lab website: <http://qichen-lab.info/>.

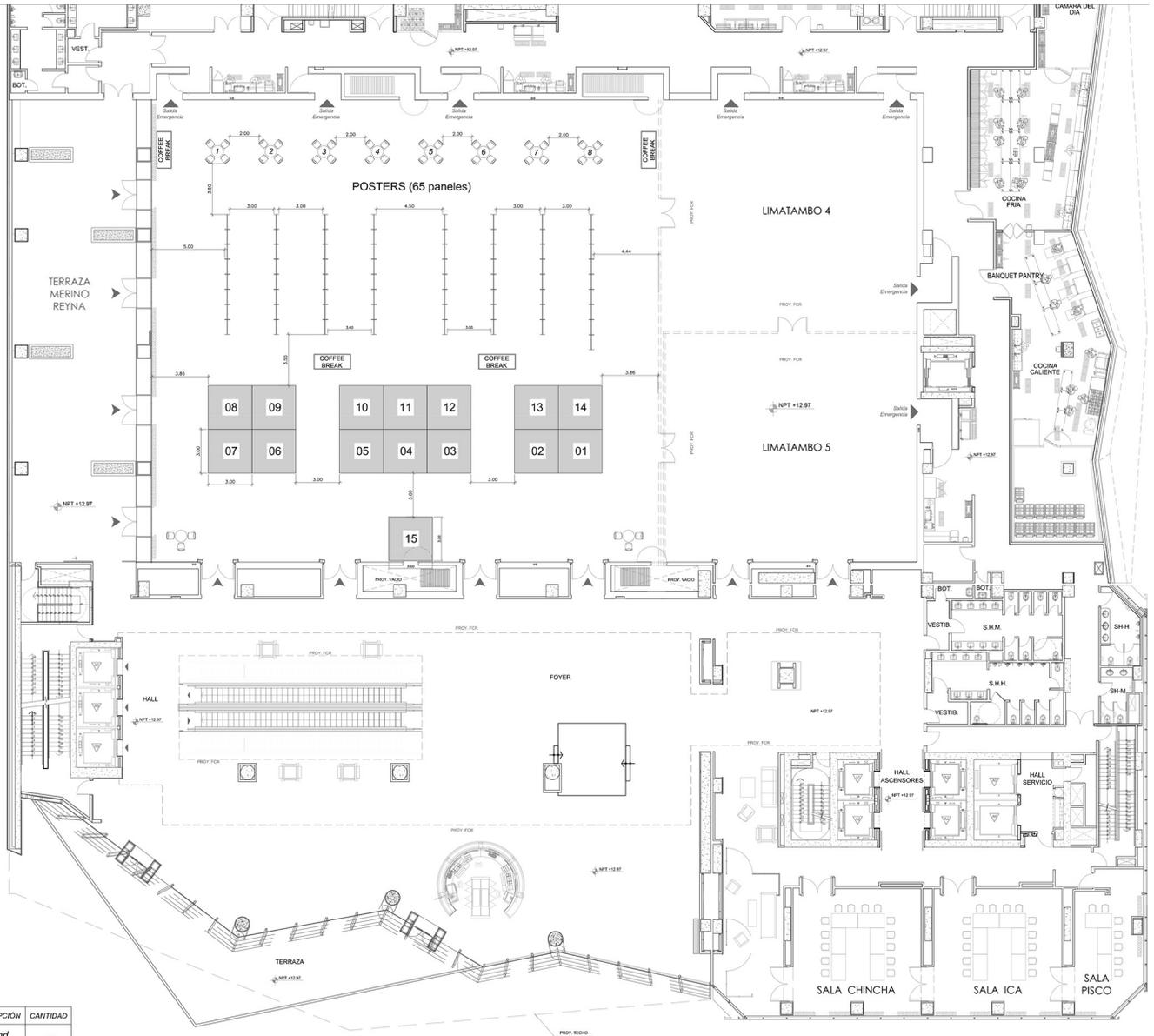
# Exhibit Directory

## Booth Listing by Number:

<b>Booth Number</b>	<b>Company</b>
1.....	Ourofino Salud Animal
2.....	Calier
3.....	IVF Bioscience
4.....	Agtech Inc.
5.....	DRAMINSKI S.A.
6.....	Professional Embryo Transfer Supply Inc. (PETS)
7.....	Stroebech Media
8, 9.....	WTA Technologies LLC
10.....	ART Lab Solutions Pty
11.....	Hamilton Thorne/IVFtech ApS
12.....	IMV Technologies/IMV Imaging
13.....	In Vitro Life
14 .....	MASED Representaciones SAC
15.....	Esco Medical

# Exhibit Hall Layout

ALUBÖRG



SIMBOLOGÍA	DESCRIPCIÓN	CANTIDAD
	Stand 3m x 3m	15

# Exhibitor Directory

## Agtech Inc.

Livestock embryo and semen technologies: since 1990, we have been formulating and designing field-tested liquid media and devices for livestock assisted reproductive technologies (ART), specifically ovum pick-up, in vitro fertilization, and multiple-ovulation embryo transfer technologies. Many products are designed by and manufactured exclusively for Agtech.

The company inventories more than 300 ART items including oocyte and embryo collection and transfer devices by WTA company, semen collection-evaluation-packaging and insemination equipment, veterinary pharmaceuticals, ICP Bioscience media for in-vitro fertilization-incubation-transfer, multi-well culture dishes, and controlled-rate portable biological freezers and incubators. We appreciate the challenges you face with your reproduction program and work hard to create and source effective, high-value solutions that positively influence your success.

Customers outside the United States find it convenient to order ART products through Agtech's e-commerce store <https://store.agtechinc.com> which enables you to select products, determine fees for transportation and duty, and pay for everything online at your convenience. Your package moves seamlessly, from Agtech's office to your destination outside the United States.

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

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

Agtech Inc.  
8801 Anderson Ave.  
Manhattan, KS 66503- USA  
Phone : +1 (785) 776-3863  
Fax : +1 (785) 776-4295  
[www.agtechinc.com](http://www.agtechinc.com)  
Booth: 4

## ART Lab Solutions Pty Ltd

ART Lab Solutions is proud to be one of the world leaders in reproductive technologies that accelerate the improvement of livestock quality. We offer a complete serum-free in vitro embryo production media suite, which is a result of over 30 years research by Professor Jeremy Thompson, the company's founder. As leaders in IVF technology for cattle breeding, we're fostering rapid

genetic improvement through the use of the best bull and the best cow genetics, improving the efficiency of cattle breeding programs worldwide.

ThincLab, 10 Pulteney Street  
University of Adelaide  
South Australia 5005  
Australia  
[www.artlabsolutions.com](http://www.artlabsolutions.com)  
Booth: 10

## Calier

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

C/ Barcelones 26  
Las Franqueses del Valles  
Barcelona 08520  
Spain  
Phone:  
[www.calier.com/en](http://www.calier.com/en)  
Booth: 2

## DRAMINSKI S.A.

Draminski is a world-leading manufacturer of veterinary ultrasound scanners for large and small animals and the systems for embryo transfer. Since 1987, the company has been designing and manufacturing specialized portable equipment for veterinary medicine. Light and rugged became the signature characteristics of Draminski products intended for the most demanding users and the toughest of conditions.

We are present on all continents with a network of over 60 certified distributors all over the world. As a global player on the market we care about the high quality of the products we offer and strong after-sales service. Innovation is in our blood adding to the company's portfolio innovative products all the time.

Ongoing cooperation with prestigious research centers and scientists throughout the world provides the understanding, use and implementation of our instruments ahead of the expectations of our customers.

Szabruk, W. Steffena 21  
11-036 Gietrzwałd  
Poland  
Phone: +48 89 675 26 00  
[www.draminski.com](http://www.draminski.com)  
Booth: 5

### **Esco Medical**

Esco Medical is a leading manufacturer and innovator of high-quality equipment such as long-term embryo incubators, ART workstations, anti-vibration tables, and time-lapse incubators. We are continuously developing technologies to meet the increasing demand of the IVF industry. Our products are designed to assist embryo development with the “Silent Embryo Hypothesis” as a guiding principle. The Silent Embryo Hypothesis states that the less disturbed an embryo can remain, the better its developmental potential will be. Most of our products are designed in Denmark and made in the EU. Our primary focus is to increase pregnancy success rates and patient satisfaction.

903 Sheehy Drive, Suite F  
Horsham, PA 19044  
[www.esco-medical.com/](http://www.esco-medical.com/)  
Booth: 15

### **Hamilton Thorne**

Hamilton Thorne Inc. (HTI) produces precision laser and imaging systems for biological markets. Over 30 years ago, HTI became a leader in the field of animal breeding. The company then embarked on a mission to bring new technologies to the ART medical market. Since then, HTI has expanded in the fertility industry and has created breakthrough products that support IVF professionals worldwide. The company remains committed to bringing industry knowledge and dedication to its full range of ART products and services. HTI believes in collaborating with diverse points of view to create customer-focused products that bring innovations to life.

100 Cummings Center, Suite 465E  
Beverly, MA 01915 USA  
Phone: 1-800-323-0503  
[www.hamiltonthorne.com/](http://www.hamiltonthorne.com/)  
Booth: 11

### **IMV Imaging**

Part of the IMV Technologies group, IMV imaging are leaders in veterinary imaging. Previously known as BCF Technology and ECM, we have been committed to helping our customers improve animal care for over 35 years. We are global leaders and specialists in veterinary imaging ultrasound.

Our current range includes but not limited to the EXAPAD full touchscreen system with high end image quality, the EXAPAD Mini with various probes and accessories

for ET and OPU technique and the wireless colour flow doppler equipped Easi-Scan:Go which is wearable and rugged with high image quality headset display.

We believe in helping our customers improve animal care and ensuring them gain the most from their diagnostic imaging technology. All our equipment is designed and manufactured in-house in Scotland and France. We provide technology that is rugged, reliable, and built to cope with the demanding environment of the farm and veterinary practice. Fast and efficient after-sales service and expertise are one of our major focuses.

### **IMV Technologies**

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

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

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

IMV Imaging  
2900 43rd Street NW, #600  
Rochester, MN 55901 USA  
[www.imv-imaging.com/](http://www.imv-imaging.com/)  
Booth: 12

IMV Technologies  
9501 Louisiana Avenue, Ste 300  
Brooklyn Park, MN 55445  
[contact@imv-technologies.com](mailto:contact@imv-technologies.com)  
[www.imv-technologies.com](http://www.imv-technologies.com)  
Booth: 12

### **In Vitro Life**

In Vitro Life SAC, is a Peruvian company. It is dedicated to the import and distribution of supplies and equipment for the application of reproductive biotechnologies in animals. We have international advisors which allows us to provide accessibility to the best brands and the most recent developments on the subject. We distribute brands such as ASTEC incubators, OKOLAB warm plates, BIRR embryotested plates, BOTUPHARMA, medium STROEBECHMEDIA, WTA, pipettes HUNTERSCIENTIFIC, micropipettes SYNGA and CRYOTECH.

We also provide professional advice on the application of the in vitro technique in species such as bovine and equine, fertilization through ICSI and embryo vitrification.

Calle Gamma 266  
Of. 302 Parque Industrial- Comercial Callao  
Lima, Peru  
Phone: +51 945 995 805  
[Invitro.life.peru2@gmail.com](mailto:Invitro.life.peru2@gmail.com)  
<https://invitrolife.pe/>  
Booth: 13

### **IVF Bioscience**

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

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

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

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

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

Falmouth, Cornwall  
United Kingdom  
Phone: +44 1326 332461  
[www.ivfbioscience.com](http://www.ivfbioscience.com)  
Booth: 3

### **IVFtech ApS**

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

for the company's entire existence to keep on creating innovative equipment to improve the everyday work life of clients and enhance the overall chances of success in fertility treatment.

Klintehøj Vænge 3-5  
3460 Birkerød  
Denmark  
+(45) 39 40 25 65  
[info@ivftech.com](mailto:info@ivftech.com)  
[www.ivftech.dk](http://www.ivftech.dk)  
Booth :11

### **MASED Representaciones SAC**

Since our creation in the city of Lima in 2007, our objective is to offer a wide variety of products, solutions and technologies for the main needs of our clients. We represent the most prestigious brands of equipment and supplies in the area of reproductive biotechnology, which has allowed us to position ourselves as one of the most important companies in the field in our country. In addition, we have different brands and equipment, according to the requirements of our customers who develop their activities in laboratories in different areas such as education, research, animal production, health, quality control, pharmaceutical, food industry, mining, etc.

RUC: 20516809524  
Av. Universitaria Sur 1091  
(antes Ramon Herrera 499)  
Cercado de Lima  
Peru  
[www.masedperu.com](http://www.masedperu.com)  
Booth: 14

### **Ourofino Salud Animal**

Ourofino Animal Health is the largest veterinary pharmaceutical with Brazilian origin. Founded in 1987, it aims to reimagine the animal health and operates in the segments of livestock and pet animals in Brazil, Mexico, and Colombia. Besides that, the company also maintains strategic partnerships that take the brand's products to several countries. As values, Ourofino Saúde Animal prizes for Take Care of People, Play to Win and Connect with the World. In 2021, received the "A melhor empresa das Américas Latina e do Sul" [The best company of Latin and South America] award, initiative of IHS Markit.

OUROFINO SAUDE ANIMAL  
Rodovia Anhanguera SP 330 – Km 298  
Distrito Industrial, Cravinhos  
Estate of São Paulo, Brazil

OUROFINO SALUD ANIMAL  
CALLE 4 SUR 43 A 195 222  
BLOQ B - Medellin, Colombia  
[www.ourofinosaudeanimal.com/](http://www.ourofinosaudeanimal.com/)  
Booth: 1

### **Professional Embryo Transfer Supply Inc. (PETS)**

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

285 FM 16  
Canton, TX 75103 USA  
Phone: 800-735-9215  
[www.pets-inc.com](http://www.pets-inc.com)  
Booth: 6

### **Stroebech Media**

Stroebech Media is a company providing IVF media for assisted reproduction techniques in animals. Three scientists, Dr. Lotte Stroebech, Dr. Birthe Avery, and Dr. Claus Yding Andersen, are behind the media formulations and protocols.

Combined they have more than 40 years of experience in media manufacturing and assisted reproductive technologies. They offer a new and optimized media product line for in vitro production. Protocols are simple and easy to follow. We have numerous solutions for immediate offers to individual customer support, as well as training and zoom sessions.

#### Quality Control:

Each new batch of media comes with a certificate specifying

- Sterility
- Fungal
- Endotoxin tests

#### Factory

- ISO9001 and ISO13485 certified and only delivering in glass bottles
- Up to 2 years shelf-life and large batch sizes

### Research and Development

- Patents for growth factors and peptides are being explored
- Continuous monitoring of stability for guaranteed shelf-life

Bovine embryo assay (BEA) test is the most important QC release parameter.

[www.stroebech-media.com](http://www.stroebech-media.com)  
[info@stroebech-media.com](mailto:info@stroebech-media.com)  
Copenhagen, Denmark  
Booth: 7

### **WTA Technologies LLC**

WTA (Watanabe Tecnologia Aplicada) is a Brazilian technology company with a branch in College Station, Texas. We specialize in producing tools for livestock and equine assisted reproduction, offering high value equipment and products for ovum pick-up (OPU), in vitro fertilization (IVF), embryo transfer (ET), and artificial insemination (AI). In addition to the products and supplies for reproduction in cattle, horses, and small ruminants, we also produce innovative laboratory equipment for every aspect of embryo production and transport. Our equipment is designed to be elegant, durable and provide precise control of conditions at an economical price.

WTA is recognized as one of the leading companies in the animal assisted reproduction market and distributes products extensively throughout the Americas, Asia, and Europe, with additional distribution to nearly all parts of the world. WTA continues to lead the industry providing innovative solutions to common problems through research and development of new products and equipment.

WTA Brazil: + 55 16 3951 8161  
Sales USA: + 979-324-6168  
[www.wtavet.com.br](http://www.wtavet.com.br)  
[www.wta.vet](http://www.wta.vet)  
Booth(s): 8, 9

Thank You to Our Exhibitors



Solutions for Cattle Breeding

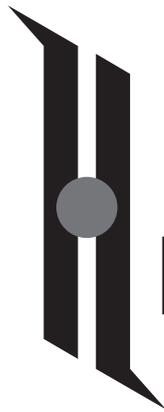


**CALIER**  
SUSTAINABILITY  
IN ANIMAL HEALTH



**ESCO**  
MEDICAL

Life has  
begun



**HAMILTON THORNE**



**IN VITRO LIFE**

*International Embryo Technology Society*

**ivf**

B I O S C I E N C E

**IVFtech**



**MASED**

REPRESENTACIONES SAC.



**ourofino**

salud animal

*49th Annual Conference*

# PETS



Professional Embryo Transfer Supply, Inc.

# S troebech media



# 2023 Preconference Workshop

## Advances in Reproductive Technologies in Camelids

The objective of the IETS 2023 preconference symposium is to provide updates and state-of-the-art training on several reproductive technologies used in research and clinical practice in alpacas and other camelids.

### Dates

January 15 and 16, 2023

### Format

The preconference symposium will consist in two modules. Module 1: Seminars (virtual format) and Module 2: Workshop (live demonstrations).

### Module 1: Seminars (Virtual Format)

This virtual event will comprise 5 lectures that will describe topics related to recent advances in the study of reproductive technologies in the South American camelids and the old-world camelids.

Date: Sunday, January 15, 2023

### Program Schedule

*Chair: J. Manuel Palomino, Universidad Científica del Sur, Lima, Peru.*

13:20 – 13:40 Introduction

13:40 – 14:30 Advances in reproductive technologies in the old-world camelids

*Julian Skidmore, Camel Reproduction Centre, Dubai, United Arab Emirates*

14:30 – 15:20 Advances in reproductive technologies in the South American camelids

*Wilfredo Huanca, Universidad Nacional Mayor de San Marcos, Lima, Peru*

15:20 – 16:00 Break

16:00 – 16:50 Embryo transfer in alpacas

*Jane Vaughan, Criagenesis, Melbourne, Australia*

16:50 – 17:40 Advances in semen cryopreservation in camelids

*Alexei Santiani, Universidad Nacional Mayor de San Marcos, Lima, Peru*

17:40 – 18:30 Advances in the study of ovulation inducing factor

*Gregg Adams, University of Saskatchewan, Saskatoon, Canada*

18:30 – 18:45 Concluding remarks

Seminars will be given in English with simultaneous translation to Spanish.

### Module 2: Workshop (Live Demonstrations)

This event will comprise four concurrent wet lab sessions of around two hours each. Each session will consist in the demonstration of one reproductive technology in alpacas and will include two or three specific activities. Each attendee will participate in all of the sessions throughout the day.

Location: Facultad de Medicina Veterinaria (FMV), Universidad Nacional Mayor de San Marcos (UNMSM), San Borja, Lima, Peru (6 km from the Westin Lima Hotel).

Date: Monday, January 16, 2023

## Transportation

The FMV will provide a bus to transport the participants from the Westin Hotel to the venue. The bus will also bring back the participants to the Westin Hotel after finishing the wet lab.

## Description of Each Session

The participants will gain experience on how reproductive technologies in South American camelids are performed at the FMV lab. They will be allocated to one of the four groups that will comprise the wet lab session. We will have four stations with one experienced demonstrator on each. Each station will have two collaborators.

### Station A: *In Vitro* Embryo Production (IVP)

Leader: Dr. Wilfredo Huanca

Activities: Oocyte retrieval from Alpaca ovaries, COCs search, and alpaca embryo evaluation

### Station B: Ultrasound-Guided Follicle Aspiration (OPU)

Leader: Dr. J. Manuel Palomino

Activities: Setting up OPU system, demonstration of OPU in alpacas, oocyte search

### Station C: Alpaca Male Handling

Leader: Dr. Willian F. Huanca

Activities: Setting up artificial vagina, male restraint, semen collection

### Station D: Semen Handling in the Lab

Leader: Dr. Alexei Santiani

Activities: Conventional and advanced evaluation in fresh and frozen alpaca semen

## Lab Schedule

Time	Activity	Participants	Location
07:30	Departure from Westin Hotel to the FMV	Everybody	Westin Lima Hotel
08:00	Introduction and guidelines	Everybody	Auditorium FMV
08:30	Simultaneous sessions	Group 1 Group 2 Group 3 Group 4	Station A Station B Station C Station D
10:30	Coffee break	Everybody	Outside station A and C
10:45	Simultaneous sessions	Group 1 Group 2 Group 3 Group 4	Station B Station A Station D Station C
12:45	Lunch	Everybody	Cafeteria FMV
14:00	Simultaneous sessions	Group 1 Group 2 Group 3 Group 4	Station C Station D Station A Station B
16:00	Coffee break	Everybody	Outside station A and C
16:15	Simultaneous sessions	Group 1 Group 2 Group 3 Group 4	Station D Station C Station B Station A
18:15	Return to Westin Lima Hotel	Everybody	FMV

## **Sponsors**

- 1) FMV, UNMSM
- 2) In Vitro Life, <https://invitrolife.pe/>
- 3) MASED, <https://www.masedperu.com/>
- 4) WTA Technologies, <https://www.wtavet.com.br/>
- 5) FORTTE SAC

# Domestic Animal Biomedical Embryology (DABE) Preconference Workshop Modeling Embryo Function *In Vitro*: The Era of Synthetic Embryos

## Monday, January 16

- 09:00 – 09:15 Introduction  
*Beatriz Fernandez-Fuertes, National Institute for Agricultural and Food Research and Technology (INIA) and Paula Rodriguez-Villamil, Recombinetics, Inc.*
- 09:15 – 10:45 The use of blastoids for studying embryo development  
*Jun Wu, University of Texas Southwestern Medical Center, USA*
- 10:45 – 11:00 Coffee break
- 11:00 – 12:30 Extended embryo culture: From pre-gastrulation to late organogenesis  
*Jacob Hanna, Weizmann Institute of Science, Israel*
- 12:30 – 13:30 Lunch (on your own)
- 13:30 – 14:00 Science SLAM presentations
- 14:00 – 14:30 Bovine blastocyst-like structures derived from pluripotent stem cell cultures  
*Carlos Pinzón-Artega, University of Texas Southwestern Medical Center, USA*
- 14:30 – 15:00 Germline transmission of MSTN knockout cattle via CRISPR-Cas9  
*Gyeong-Min Kim, Seoul National University, South Korea*
- 15:00 – 15:30 Genome-wide association study to identify candidate genomic regions for cow fertility in Retinta cattle breed  
*Nora Laseca García, University of Cordoba, Spain*
- 15:30 – 17:00 Round table on the perspectives of using synthetic/*in vitro* modelling embryos in practice  
*Moderated by Cody Kime, Trans Ova Genetics, USA, and Paula Rodriguez-Villamil, Recombinetics, USA*
- 17:00 – 17:15 Closing remarks and Science SLAM award
- 17:15 – 18:30 Social

To make it more interesting for all IETS members, we have included a roundtable on the perspectives of using synthetic/*in vitro* modelling embryos in practice. We hope to generate a lively discussion that is interesting for all IETS community and attract practitioners to the workshop.

# IETS Health and Safety Advisory Committee Preconference Symposium Media News or New Media—How Safe are *In Vitro*-Produced Embryos for International Trade?

Monday, January 16

Co-Chairs: George Perry and Marc-André Sirard

It was a little over 40 years ago when a cow gave birth to the first calf produced from *in vitro* fertilization. Since then, research has resulted in enormous advances in the production of *in vitro*-produced (IVP) embryos, more so in recent years in North and South America and in Europe with the advent of sexed semen and genomic selection. Fine tuning of nutrition and environment of the *in vitro* oocyte maturation and embryo culture processes has significantly reduced the risks of physiological and anatomical defects and has thus created opportunities for safe domestic and international trade in IVP embryos of livestock. Already, global production and transfer of bovine IVP embryos far exceed the collection and transfer of bovine *in vivo* derived embryos.

However, very little research has been done in managing the sanitary status of IVP embryos, in ensuring the negligible risks of disease/pathogen transmission via embryo transfer. Much of the early research is no longer applicable. New research is unlikely. There has been relatively little progress in developing international trade, and consequently, fewer opportunities to develop advanced livestock breeding programs using the latest tested and proven technologies offered by IVP embryos.

It is now time to explore alternatives to the conventional approach to assessing disease transmission risks in IVP embryos, especially as, for livestock, co-culture cells and serum are no longer used for most commercial IVP embryo production.

This symposium will highlight the recent advances in the sanitary processes involved in producing IVP embryos, and the experiences of IVP laboratory personnel, researchers and ET practitioners in managing possible disease transmission risks and explore the use of available ET datasets to assess these transmission risks. Experts will then propose recommendations for the safe, efficient, and effective trade in livestock IVP embryos.

There will be opportunities for discussions and questions and answers after afternoon tea.

We look forward to your attendance at this very important symposium. For those who cannot travel to Lima, Peru, there will be provision for a virtual conference. Accommodations can be booked at the Westin Lima Hotel and Convention Center, where the symposium will be held.

## Session 1: Developments in IVP Embryos in the Past Decade

08:50 – 09:00 Introduction

*Marc-André Sirard, Université Laval*

09:00 – 09:15 Global production of IVP embryos vs. IVD embryos

*João Viana, Embrapa*

09:15 – 09:40 Recent advances in bovine IVP embryos toward cell-free and serum-free media

*Luciano Bonilla, Vytelle*

09:40 – 10:05 Recent advances in ovine and caprine IVP embryos

*Alejo Menchaca, Instituto Nacional de Investigación Agropecuaria (INIA)*

10:05 – 10:30 Recent advances in equine IVP embryos  
*Giovanna Lazzari, AVANTEA*

10:30 – 10:50 Break

## **Session 2: Sanitary Controls During Collection and Processing of IVP Embryos for International Trade**

10:50 – 11:15 Introduction  
*George Perry, Consultant*

11:15 – 11:40 The researcher's perspective  
*Jennifer Barfield, Colorado State University*

11:40 – 12:05 The practitioner's perspective  
*Kyle Clymer, Trans Ova Genetics*

12:05 – 12:30 The regulator's perspective  
*Laszlo Kuster, EU Commission*

12:30 – 13:30 Lunch (on your own)

## **Session 3: Certification—Developing an International Veterinary Certificate for IVP Embryos**

13:30 – 13:45 Introduction  
*Daniela Demetrio, DD Embryos*

13:45 – 14:10 The exporter's perspective  
*Edwin Coles, ABS Global*

14:10 – 14:35 The importer's perspective  
*Ashley Swenson, Midwest Embryo Transfer Service*

14:35 – 15:00 The regulator's perspective  
*Etienne Bonbon, President, OIE Terrestrial Animal Health Standards Commission*

15:00 – 15:30 Break

## **Session 4: Discussion Forum**

15:30 – 16:30 Panel discussion, Q & A session  
*Marc-André Sirard, Université Laval*

16:30 – 17:00 Closing remarks  
*Cesare Galli, AVANTEA*

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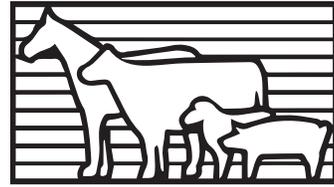
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The logo for TRANS ova genetics features the word 'TRANS' in a bold, sans-serif font. To its right is a stylized 'ova' logo consisting of a female symbol (a circle with a vertical line) and a male symbol (a circle with a vertical line and an arrow) positioned above the letters 'ova'. Below 'ova' is the word 'genetics' in a smaller, lowercase, sans-serif font, which is underlined.

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# Notes

