



AETE

Association Européenne des Technologies de l' Embryon
Association of Embryo Technology in Europe

July 2023

AETE Newsletter Issue 58

Editor: [Roger Sturmeij](#)

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PRESIDENTS LETTER

Dear friends and colleagues,

It is with great pleasure that I invite you to the 39th Annual Scientific Meeting of AETE. The meeting will take place on the magnificent island of Crete, in its capital city of Heraklion from 7th to 8th September. The venue, Hotel Galaxy, is located close to the city center. With comfortable and spacious rooms, a nice restaurant and coffee area, and a beautiful pool, it is an excellent venue for our meeting. While writing this, the preparations of the next AETE meeting are proceeding with pace.

The Local Organizing Committee, chaired by Georgios Amoiridis, together with Artion, have worked hard to provide us ideal settings for our meeting as well as an outstanding social

program. The theme of our 2023 AETE meeting is ***The Interaction of ARTs and the Environment***. We address this interaction from two perspectives: how the environmental changes might affect the reproduction of livestock and how our activities in ART might affect the environment. We have put together an exciting scientific program and invited excellent speakers to discuss these challenging topics.

Our meeting will start with a Welcome Reception that takes place in the evening of Wednesday, September 6th, at the hotel's pool area. After this reunion, the scientific program will be launched on Thursday by Urban Besenfelder with a title "*The interaction between the environment and embryo development in assisted reproduction*". The talk of our second invited speaker, Hilde Aardema will address a current topic titled "*The potential impact of microplastics on reproduction*". Pietro Baruselli, representing our Brazilian sister society SBTE, will cover "*The contribution of assisted reproductive technologies and reproduction management to reducing the CO2 equivalent emissions of dairy and beef industry*". Conservation biology will be addressed in William Holt's talk entitled "*Environmental effects on developmental plasticity in conservation biology*".

The AETE board is honored to announce Sabine Meinecke-Tillmann and Burkhard Meinecke will be presented with the Pioneer Awards of 2023 for their pioneering, wide and versatile work in the field of assisted reproduction, especially in sheep and goat. Burkhard Meinecke served as a president of AETE in mid 1990's.

We thank everyone for sharing high quality abstracts for this year's meeting, to compete for the best oral presentation, best poster and student competition, where for the first time, the winner from the finalists will be selected by a jury composed of you among others, and not the board as usually. You can let us know about your availability in Conftool together with meeting registration by ticking the corresponding boxes.

This year, the board decided to plan the Practitioners' Forum as a plenary session, based on your input of last year. We encourage all of you to attend the forum, regardless of your professional profile. With this arrangement, we aim to work towards bridging the science and the practice. This forum, "SOPs for Donors and Recipients" will be sponsored and coordinated by Calier, and will present the outcome of the work of an international expert committee, followed by a round table discussion. On Friday, the scientific program will culminate in a Workshop on "Animal Welfare in ARTs". This interactive workshop aims to: discuss the perception of animal welfare; present current situation of regulations and; highlight some initiatives, including some research studies, to evaluate impacts of some ARTs on animal welfare.

The social program will take us to Arolithos Traditional Cretan Village, located just 12 km from the hotel, on Thursday evening. There we will experience a Cretan evening, walking in the village's narrow streets on a short journey through the history, before enjoying a dinner, and finally letting the vibrating Cretan rhythms to dance us. Our meeting will end in a Farewell Party in a club downtown on Friday. Remember to take your dancing shoes with you!

For those of you who have a chance to travel a bit earlier or stay a day longer, there is a selection of excursions available. The excursions are an excellent opportunity to see around the island in a brilliant company of AETE friends.

Next September, the board will need two new members, as our secretary Teresa Mogas and treasurer Jan Detterer will leave the board after several years of dedicated service. The duties of the secretary and treasurer will be continued by Christine Wrenzycki and Pascal

Salvetti, respectively, both of whom entered the board last September in Utrecht. Even though these two specific positions have been already filled, we need two board members to take care of the many other responsibilities in the board. Please step up and propose yourself to any of us board members before the General Assembly and board member elections if you are interested in serving the society in the board.

This meeting would not be possible without the valuable support of our sponsors! On behalf of the whole board, I want to express our gratitude to all of them, old and new ones.

Finally, I want to wish you all a nice and relaxing summer before we will meet at the AETE meeting in Heraklion.

AETE BOARD MEMBERS

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AETE Board members – 2022-2023



L:R Pascall Salvetti; Helene Quinton; Jane Morrell; Hilde Aardema; Marja Mikkola; Christine Wrenzycki; James Quinn; Teresa Mogas; Jan Detterer (Roger Sturmey not in photo)

IMPORTANT UPDATES TO EU REGULATIONS

Published on the 10th of April this year, the EU commission amended the delegated EU regulation 2020/686 (The approval of germinal product establishments and the traceability and animal health requirements for movements within the Union of germinal products of certain kept terrestrial animals).

The main point regarding our ET business is the fact that **embryo collection teams are now allowed to collect, process and store oocytes**. This was previously only allowed by embryo production teams.

The main points are as follows:

1. Reason for the changes regarding the ET-teams:

During the implementation of Delegated Regulation (EU) 2020/686 several Member States and stakeholders indicated that following recent developments and specialisations in the germinal product sector, **the definition of embryo collection team should also include a team which only collects and handles unfertilised oocytes**. That definition and the related requirements should therefore be amended to cover such a team.

2. New definition:

“**Embryo collection team**” means a germinal product establishment comprised of a group of professionals or a structure approved by the competent authority for the collection, **processing, storage and transport of oocytes** or in vivo derived embryos of bovine, porcine, ovine, caprine or equine animals intended for movement to another Member State, as referred to in Article 4.

3. Main changes in the articles:
a. In Article 3, point (b) is mentioned that the **collection team** is allowed to perform the

collection, processing and storage of oocytes or embryos. b. In PART 2

REQUIREMENTS FOR THE APPROVAL OF AN EMBRYO COLLECTION TEAM REFERRED TO IN ARTICLE 4

The laboratories referred to in points (i) and (ii) must be designed and have a layout so as to **prevent the cross-contamination of oocytes or in vivo derived embryos**, and team operations shall be carried out in a manner that prevents such cross-contamination;

You can find the complete version here:
<https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:02020R0686-20230410>

Contributed by Jan Detterer

SURVEY ON ANIMAL

WELFARE

Animal welfare is an increasing demand in terms of animal husbandry.

IETS (International Embryo Technology Society) would like to take stock of the practices of professionals. Your opinion is therefore very important.

This survey is designed to have your feedback related to some elements of the five freedoms of animal welfare as they may be relevant to reproduction and your activities.

To remember, the 5 freedoms of animal welfare include the following domains : good feeding, protection against climatic or physical extreme conditions, good health, expression

of normal behaviour and absence of fear and distress.

This survey is part of a veterinary thesis from the Veterinary School of Maisons Alfort (Paris - France) in collaboration with IETS. All the information will be treated anonymously. You can take part by following this link:
<https://tinyurl.com/3hc4p9c5>

TRAVEL GRANT

AWARDEES

Each year, we invite students to apply for a travel grant to support their attendance at the annual conference of the AETE. The Board are delighted to announce **three** awards this year:

Rosanne Mazzarella, of INIA/CSIC, Spain
Marcos Luis Calera, of Universidad de Extremadura, Spain
Phakrija Sanguansook, of Chulalongkorn University, Thailand.

Each awardee has submitted a short article of their overall research projects which can be found below.

Congratulations to the recipients of the AETE travel grants for 2023, and make sure you check out their presentations at the meeting in September!

(And remember, we offer travel grants every year to support attendance at AETE annual meeting; for further details, please visit:

<https://www.aete.eu/students/travel-grant/>

TRAVEL GRANT ARTICLES

Extracellular Vesicles: Modulators of Maternal-Embryonic Interaction and Fertility in Cattle.

Rosanne Mazzarella

Reproductive performance is one of the most important factors affecting the profitability of cattle farms and national economies, as well as the living standards of rural and urban societies. Studies on physiological mechanisms and interactions between the maternal reproductive tract (oviduct and uterus) and the developing embryo,

particularly those mediated by extracellular vesicles (EVs), are essential. Based on that the global objective of my PhD thesis is the molecular and protein characterization of oviductal, uterine and embryo/conceptus EVs as modulators of embryo-maternal crosstalk in cattle and their potential implications for the pregnancy success. To accomplish this, our research focuses on the following objectives: I) Identifying the molecules and proteins present in *in vivo*-produced EVs, triggered by the presence of an embryo during key developmental stages (Day 3: 8-16 cells, Day 7: blastocyst, and Day 15: elongated conceptus); II) Identifying the molecules and proteins contained in *in vitro*-produced EVs, utilizing uterine and oviductal explants in response to early-stage embryo/conceptus (Day 3, Day 7, and Day 15); III) Evaluating the potential capacity of EVs during *in vitro* embryo development, along with the role of their microRNAs as biomarkers for embryonic development and quality. Our goal is to enhance assisted reproductive technologies and ultimately improve the success rates of cattle pregnancies as well as contribute to the advancements of reproductive biology.

Mare follicular fluid secretome as an additive during *in vitro* oocyte maturation: effects on equine *in vitro* embryo production.

Marcos Luis Calera

A better understanding of follicular physiology and oocyte maturation in the mare may improve the oocyte's meiotic and developmental competence, and hence, the efficiency of *in vitro* embryo production (IVEP) in the horse. Oocytes are matured *in vivo* in the follicular fluid being the so-known secretome (the bioactive cargo secreted by granulosa cells) responsible for complete oocyte maturation. The secretome is composed by proteins, metabolites, cytokines, microRNAs, and extracellular vesicles (EVs), among others. Hence, we aim to describe the proteomic and metabolomic profile as well as the presence of cytokines, microRNAs and EVs in the secretome of equine preovulatory follicular fluid. Also, secretome will be used as an additive during *in vitro* maturation (IVM) of equine oocytes to evaluate its effect on meiotic competence and the expression of candidate genes related to oocyte quality and metabolism. Then, oocytes matured in the presence or absence of secretome will be

fertilized by intracytoplasmic sperm injection and the blastocyst rate, gene expression related to embryo development and quality as well as the pregnancy rate after embryo transfer will be evaluated. Our results may lead to an improvement in current *in vitro* embryo production that could directly be applied to the equine breeding industry.

M L-C is funded by a grant "Acción II" from the UEx-Banco Santander (Ref. Beca RC1).

Feline IZUMO1 and JUNO: promising targets for development of non-surgical contraception in domestic cats

Phakjira Sanguansook

The overpopulation of feral cats is a problem worldwide. Although surgical contraception is the current policy for cat population control, it has limitations in terms of time and budget consuming. Non-surgical contraception such as immunocontraception is an alternative method for cat population control, however the commercially available contraceptive vaccines still demonstrated limited efficacy in cats. Therefore, the search for novel antigens is required. Recent research suggested that IZUMO1 and JUNO may be potential candidates since they are gonad-specific and indispensable for fertilization. So, my research focuses on studying basic information of feline IZUMO1 and JUNO as it is the first step that is required before developing contraceptive strategies based on these antigens.

First, my doctoral thesis aims to demonstrate the presence of the messenger RNA coding for feline IZUMO1 and JUNO from gonads of cats. Second, the expression of these genes was studied in gonads and different visceral tissues of cats. This experiment allows to confirm the safeness of contraceptive strategies against these targets- if feline IZUMO1 and JUNO have gonad-specific patterns, inhibition of them will not interfere with other organs' function. Finally, the last experiment aims to demonstrate the expression of IZUMO1 during sperm maturation and JUNO during folliculogenesis. The outcome will let us know whether the vaccine against them will be irreversible or not.

Together, my thesis will facilitate the development of novel contraceptives targeting IZUMO1 or JUNO in cats which will make benefits for cat population control program.

OUR SPONSORS

*Thanks to all
our sponsors!*

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FINAL DETAILS – ANNUAL MEETING

2023 - HERAKLION!

Following the very successful 2022 Meeting in Utrecht, this year the AETE Meeting moves in **Heraklion – Crete, Greece** and we look forward to welcoming you!

Heraklion is the largest city of Crete and one of Greece's major urban centers. The city flourished under a multicultural influence throughout the centuries; that's why there is a plethora of Byzantine, Venetian and Ottoman structures to look out for!



The Venue, **Galaxy Hotel**, offers a 5 Star luxury experience artfully blended with innovative modern comforts. Elegant minimalism, polished modernity and plush materials in soothing neutral tones define a decor that inspires effortless comfort and style. Located in a quiet area just outside of the center of Heraklion, the hotel is housed in an immaculately renovated building of timeless design in an accessible area with parking.

The AETE 2023 Meeting will occupy the lower level and the pool level of the hotel so we will have the opportunity to enjoy breaks and network between the exhibition area and the pool.

The **Welcome Reception** on the evening of **September 6** will be held at the hotel, but we have found some great venues for our social events!

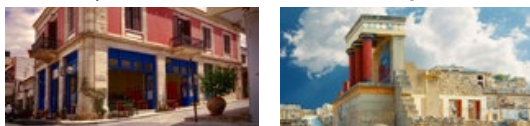
The **Meeting Dinner** on **September 7**, this year will be a Traditional Cretan Dinner at the **Traditional Cretan Village of Arolithos**, where you can enjoy this cultural experience and create unique memories.

In addition, on the **last day** there will be a **Farewell Party** with music, dancing, cocktails and drinks at **The Garden**.

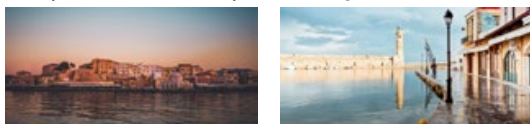
Last but not least, you can register for our **Excursions** to explore and enjoy more of Crete here: <https://artion.event-sair.com/aete/regform/Site/Register>.

You can choose between:

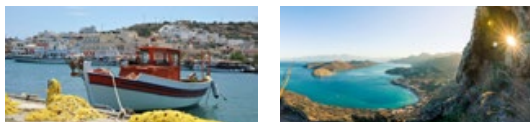
A Half Day tour: Archanes – Knossos on Sep 06, 2023



1-Day tour Chania-Rethymno on Sep 09, 2023



1-Day tour Elounda-Spinaloga on Sep 09, 2023



How to reach Galaxy Hotel: 75 Dimokratias Av., 71306, Heraklion, Crete – Greece

- Airport: Nikos Kazantzakis, International Airport (5 km)
- Port: Heraklion Port (1 km)
- By Road: To/From Ag. Nikolaos (Eastern Crete) and Rethymnon & Chania (Western Crete), Highway Exit (1 km)

How to reach Heraklion:

By Air

Heraklion International Airport "Nikos Kazantzakis" is the second busiest airport in Greece. It is named after the famous writer and is located at Alikarnassos, 4km from the center of the city.

How to get to Heraklion city centre from the Airport?

Taxi: www.heraklion-airport.info/taxi.html

Rent a car: www.heraklion-airport.info/car-hire.html

Public bus: www.heraklion-airport.info/bus.html

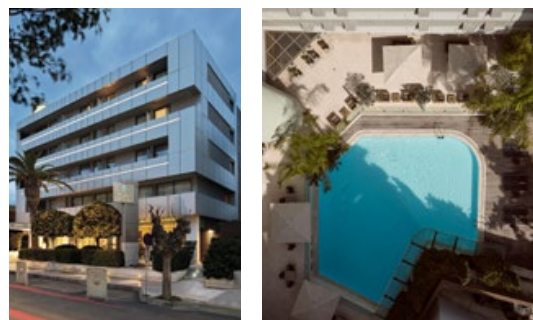
By Sea

From Athens (Peiraeus Port) or Thessaloniki.

Visit www.greekferries.gr/ or www.ferryconnection.com/ for itineraries all over Greece.

Where to stay:

GALAXY HOTEL IRAKLIO



Accommodation Link: <https://artion.event-sair.com/aete/regform/Site/Register>

Galaxy Hotel holds prime position in the city center of Heraklion and remains the number one destination for all discerning business travelers. Conveniently located just 15 minutes from Heraklion airport.

We are really excited about this year's meeting and look forward to seeing you in Heraklion!



AETE

Association Européenne des Technologies de l' Embryon

Association of Embryo Technology in Europe

39th SCIENTIFIC MEETING

**Galaxy Hotel
Heraklion, Greece**

P R O G R A M M E

7th and 8th September 2023

WEDNESDAY, September 6th 2023

18.30-20.00: Registration

20.00-22.00: Welcome Reception at Galaxy Hotel

THURSDAY, September 7th 2023

08.00-17.00: Registration

08.15-8.30: Opening meeting: AETE President Marja Mikkola and Chair of the LOC Georgios Amoiridis

SESSION 1: Chairpersons: HILDE AARDEMA & ROSANE MAZZARELLA

08.30-9.15: *First invited lecture*

Urban Besenfelder, Institute of Animal Breeding and Genetics, University for Veterinary Medicine Vienna, Vienna, Austria.

The interaction between the environment and embryo development in assisted reproduction

09.15-10.00: Short oral communications (SO) & Flash talks (FT)

Thanya Pranomphon et al. *Oviduct epithelium spheroids support embryo development under oxidative stress conditions in cattle (SO)*

Mohamed Hedia et al. *High concentrations of lipopolysaccharides are associated with decreased progesterone concentrations in equine follicular fluid (SO)*

Santa María Toledo Guardiola et al. *Derived-proteome of extracellular vesicles from uterine fluid is modified depending on seminal plasma fraction during early pregnancy (FT)*

Ramses Belda Perez et al. *Effects of a polycaprolactone and polyethylene glycol diacrylate, 3-D printed scaffolds, on bovine embryo development in vitro (FT)*

10.00-11.00: POSTER SESSION 1, EXHIBITION and coffee break

SESSION 2: Chairpersons: TERESA MOGAS & ROGER STURMEY

11.00-11.45: *Second invited lecture*

Hilde Aardema, Faculty of Veterinary Medicine, Utrecht University, The Netherlands.

The impact of microplastics on female reproduction and early life

11.45-13.00: Short oral communications: *Student Competition*

Jessica Patricia Kurzella et al. *Sex-specific contours of mitochondrial respiration characteristics at the pre-elongation stage in individual bovine embryos*

Rosane Mazzarella et al. *Embryo-induced alterations in the protein profile of bovine oviductal extracellular vesicles*

Ben Meulders et al. *Mitochondrial dysfunction during oocyte maturation and its impact on embryo epigenetic programming: mechanistic insights*

Pilar Sòria-Monzó et al. *ZP2 is essential for embryo development in golden hamster (*Mesocricetus auratus*)*

Jiayi Yang et al. *Uptake and effects of nanoplastics in maturing oocytes*

13.00-14.30: Lunch/Student Lunch

SESSION 3: Chairpersons: JAN DETTERER & JIAYI YANG

14.30-15.15: *Third invited lecture*

Pietro Baruselli, Departamento de Reprodução Animal, FMVZ-USP, São Paulo, Brazil.

Applying assisted reproductive technology and reproductive management to reduce CO₂-equivalent emission in dairy and beef cattle: a review

15.15-16.00: Short oral communications & Flash talks

Giselle Gamarra et al. *Laser-Assisted Biopsy is an efficient technique to perform genetic analysis of Bovine Embryos in Selected Breeding Programs (SO)*

Erik Mullaart *et al.* Birthweight data of IVP calves (SO)

Waleed Marei *et al.* Metabolic stress during the postpartum period in dairy cows might influence follicular growth dynamics at the time of breeding. A retrospective analysis (FT)

Dessie Salilew-Wondim *et al.* Sex-specific gene expressions of bovine elongated embryos triggered by the physiological conditions of the recipients (FT)

16.00-17.00: POSTER SESSION 2, EXHIBITION and coffee break

17.00-18.45: *Practitioners' forum: SOP's for Donors and Recipients*

Coordinated by Ana Isabel de Prado Taranilla and James Quinn. Sponsored by CALIER

20.00-02:00: Traditional Cretan Dinner at Arolithos Traditional Cretan Village

FRIDAY, September 8th 2023

SESSION 4: Chairpersons: JANE MORRELL, BEN MEULDERS & JESSICA KURZELLA

08.30-09.15: *Fourth invited lecture*

William Holt, Department of Oncology and Metabolism, The Medical School, Sheffield, UK.

Biobanks, offspring fitness and the influence of developmental plasticity in conservation biology

09.15-10.15: Short oral communications & Flash talks

Alba Pérez-Gómez *et al.* Transforming growth factor beta (TGFB) pathway is required for the proliferation of bovine extra-embryonic membranes following blastocyst hatching (SO)

Konstantina Asimaki *et al.* Endocrine disrupting chemicals induce alterations in lipid droplets of bovine cumulus cells (SO)

Phakjira Sanguansook *et al.* Decellularization of female domestic cat's reproductive organs: ovary, oviduct and uterine horn (SO)

Nuria Martínez de los Reyes *et al.* Optimization of heterologous IVF with Iberian ibex (*Capra pyrenaica*) sperm and domestic goat (*Capra hircus*) oocytes (FT)

Alexandra Marie Shattock *et al.* Localization of toll-like receptor 7 (TLR7) in bull, ram and dog spermatozoa and assessment of its use as a sexing target (FT)

10.15-11.15: POSTER SESSION 3, EXHIBITION and coffee break

11.15-12.00: General Assembly

12.00-12.15: Sponsor presentation

12.15-13.45: Lunch

SESSION 5: Chairpersons: CHRISTINE WRENZYCKI & PILAR SÒRIA-MONZÓ

13.45-14.45: Short oral communications & Flash talks

Joaquín Gadea *et al.* Effective generation of double knock-out TPC1 and TPC2 porcine embryos by CRISPR-Cas9 electroporation of oocytes before insemination (SO)

Linda Marijke Haug *et al.* Cumulus cell gene expression identifies key mechanisms influencing porcine oocyte developmental competence (SO)

Marcos Luís Calero *et al.* Secretome of follicular fluid influences cytokine uptake by equine cumulus-oocyte complexes when added during in vitro maturation (SO)

Julietta Hamze *et al.* IZUMO1 is required for gamete fusion in rabbits (FT)

Véronique Duranthon *et al.* In vitro production of bovine embryos modified sex-dimorphisms in fetal liver methylome (FT)

14.45-15.45: *Fifth invited lecture*

Sabine Meinecke-Tillmann and Burkhard Meinecke, Institute for Reproductive Biology, University of Veterinary Medicine, Hanover, Germany.

Lab partners: *Oocytes, embryos and company: A personal view on aspects of oocyte maturation and the development of monozygotic twins*

15.45-16.00: *Pioneer award 2023*-Sabine Meinecke-Tillmann and Burkhard Meinecke AETE Medalist

Presentation, introduced by Christine Wrenzycki and Martin Gehring

16.00-17.00: *POSTER SESSION 4, EXHIBITION* and coffee break

17.00-18.30: *Workshop II: Animal welfare in ART's*

Chaired by **Pascal Salvetti**, Eliance and **Hélène Quinton**, Synetics, France
Ana Granados Chapatte, EFFAB, Belgium & **Eva Sossidou**, Hellenic Agricultural Organization-Demeter, Greece & **Alline De Paula Reis**, Ecole Nationale Vétérinaire d'Alfort, France: *Animal welfare context and consequences on embryo technologies business.*

Pascal Salvetti, Eliance, France & **Fritz Beyer**, Institute for Reproduction of Farm Animals Schönow, Germany: *How professionals react and take into account these aspects.*

18.30-19.00: Closing session: Results of competitions and elections and invitation to the AETE Conference 2024

20.00-24:00: Farewell party: The Garden - sponsored by Vetoquinol

