MAY 2026

AFRODITA NEWSLETTER

Celebrating AFRODITA's Second Year: Scientific Progress Across the Network

As AFRODITA celebrates its **second year**, the network continues to make strong progress towards its **scientific and training objectives**. Doctoral candidates are actively contributing to the development of new knowledge, innovative technologies, and translational tools that aim to improve assisted reproduction techniques (ART) and reproductive health. These achievements include 13 peer-reviewed publications, 11 international conference presentations and one European patent application. In parallel, the doctoral candidates have continued to strengthen their technical and transferable skills through the Training School 2, held in Italy at the University of Teramo and Diatech Pharmacogenetics. All 15 doctoral candidates received intensive theoretical and hands-on training in reproductive diagnostics, microscopy, genomics, and AI-based approaches. Together, these results demonstrate AFRODITA's progress from doctoral training and discovery towards real scientific, clinical and industrial impact.

Advancing knowledge on gametes, embryos and ART-derived effects

Key advances include the identification of **altered RNA profiles in aged mouse sperm**, evidence that **CoQ10 may reduce oocyte aneuploidy in women of advanced maternal age**, and the establishment of an 8% chromosomal abnormality baseline in *in vitro* produced bovine blastocysts.

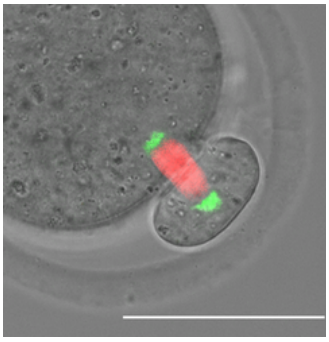
AFRODITA has also identified a Temperature-Humidity Index threshold of approximately 60 affecting commercial bull sperm quality, based on more than 20,000 ejaculates.

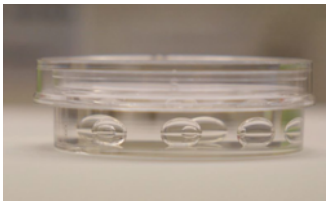
The scientific outputs in this area also include a review published in *Animal Reproduction* that discusses advanced *in vitro* approaches to study **embryo–maternal cross-talk**, including 2D and 3D culture systems, organoids, microfluidics and extracellular vesicles. Another review, published in *Human Reproduction Update*, examines **epitranscriptomic modifications in embryonic development** and how ART-related stressors may affect RNA methylation, embryo competence, placental function and offspring development.

Read More on our website : www.afrodita-dn.eu/web/afrodita/about

Developing innovative solutions to improve ART outcomes

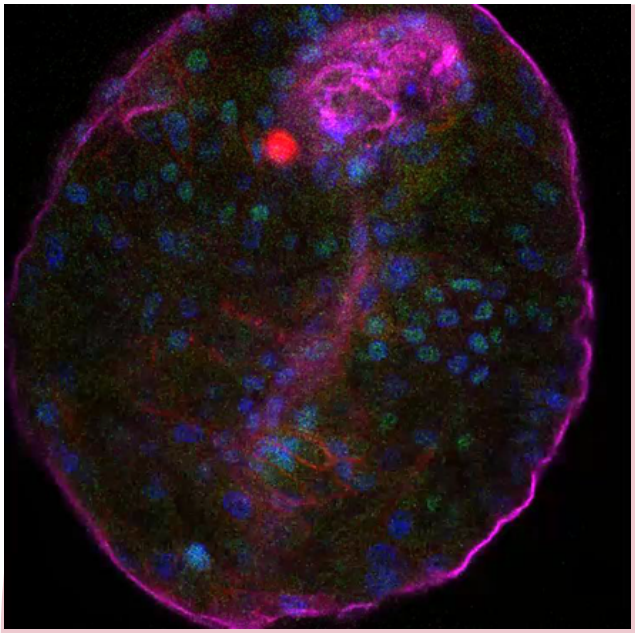
One important line of research within AFRODITA is being carried out by Doctoral Candidate Camila Rojo, who is investigating the relationship between **oxidative stress and oocyte quality**. Her work has shown that elevated non-esterified fatty acid levels negatively affect oocyte quality, while Trolox showed promising antioxidant rescue effects. In parallel, ongoing multi-omics analyses of rescue-IVM oocytes and cumulus cells are helping to uncover the **molecular signatures behind oocyte maturation** and developmental competence.





The network is also advancing towards future infertility solutions through the establishment of **mouse embryonic stem cells** in different pluripotent states, supporting progress towards the in vitro generation of gametes. Another highlight is the development of a **3D-printed oviduct-inspired device** made with polycaprolactone. This prototype has shown full biocompatibility, improved cell adhesion and normal fertilisation patterns in a porcine model, offering a promising platform to improve in vitro embryo development.

Organoids, extracellular vesicles and biomarkers for fertility and implantation



Uterine Bovine Organoid produced by Nathaly Hernandez

Reference: *Navarro-Serna, S., Romero-Aguirregomezcorta, J., Hernández-Díaz, N. et al. Hormonally responsive bovine oviductal organoids recapitulate native oviductal secretions and enhance sperm capacitation. Cell. Mol. Life Sci. (2026).*

Bovine and human uterine–oviductal organoids have been established, with RNA-sequencing and proteomics confirming that they recapitulate naïve tissue behaviour and respond to hormones. Organoid-derived secretions are now being tested as **additives for biomimetic embryo culture**. Doctoral Candidate Haitao Li is also advancing AFRODITA's work on **implantation biomarkers** by identifying key **microRNAs** as potential **non-invasive indicators** of implantation in humans, reaching 83.3% pregnancy prediction accuracy.

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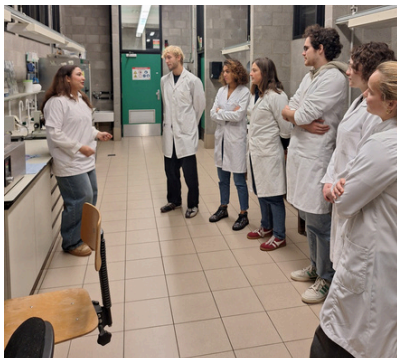
Sharing science beyond the lab

AFRODITA doctoral candidates have taken the project's research beyond the lab through outreach and public engagement activities across several countries. To date, the project has participated in **more than 40 communication and dissemination activities**, including **hands-on workshops** at the 2nd Education, Employment and Youth Fair in Fuente Álamo, International Day of Women and **Girls in Science talks** in Madrid and Murcia, "Ciencia en el barrio" and Open **Science events for families** at CSIC-INIA, the Reproyoung 2.0 talk at Herlev Hospital in Copenhagen, the "The Beginning of Life" workshop, **science week activities**, an online seminar for former students in Colombia, hands-on IVF workflow training at Ghent University, and an elevator-pitch style talk organised by EUniWell and the University of Santiago de Compostela. By engaging school students, families, teachers, former students, researchers, and the general public, these activities are helping AFRODITA strengthen science communication, transferable skills, and societal impact.

Participation in outreach events organised in celebration of the International Day of Women and Girls in Science in high schools by Michela Prestianni and Laura Abril



Hands-on practice to master's students delivered by Arooj Azeem (Ghent University)

Elevator pitch' style talk by Peter Silke (EUniWell and the University of Santiago de Compostela)

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