

1. Institution

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2. Principal investigator and contact person

Enrique Gómez (egomez@serida.org)

3. Key personnel

Carmen Díez	mcdiez@serida.org	embryology, ART, cryopreservation
José Néstor Caamaño	jncaamano@serida.org	oocyte/embryo micromanipulation
Marta Muñoz	mmunoz@serida.org	in situ ARN and protein, metabolomics.

4. Research profile

Proteomic profiling of maternal interactions with male and female bovine embryos at the early uterine stages, and functional role of differentially expressed proteins. In vitro embryo production and embryo transfer with sex – sorted, frozen – thawed bovine sperm. Non-invasive techniques to predict viability and bearing sex of embryos in single culture (metabolomic spectroscopy) and oocytes (Polarizing light microscopy in cow, pig, sheep and goat). Vitrification of IVP embryos and oocytes produced with sex – sorted sperm. Induction of sublethal stress as a way to improve cryopreservation survival.

5. Key technologies and tools

in vitro and in vivo production of embryos – NIR and Raman spectroscopy – Vitrification of embryos and oocytes by a number of techniques - Oocyte microinjection and manipulation (Oosight®; bovine, pig) – RT-PCR – Immunohistochemical and In-situ Hybridization.

6. Selected publications (max. 5)

Trigal B, Gómez E, Díez C, Caamaño JN, Martín D, Carrocera S, Muñoz M (in press, 2011) In vitro development of bovine embryos cultured with Activin A. *Theriogenology*.

Caamaño JN, Muñoz M, Díez C, Gómez E. (2010) Polarized Light Microscopy in Mammalian Oocytes. *Reproduction in Domestic Animals*, 45 (Suppl,2) :49-56.

C Díez, P Bermejo-Alvarez, B Trigal, JN Caamaño, M Muñoz, I Molina, A Gutierrez-Adan, S Carrocera, D Martín, E Gómez (2009) Changes in testosterone or temperature during the in vitro oocyte culture do not alter the sex-ratio of bovine embryos. *Journal of Experimental Zoology - Part A Ecol Genet Physiol*. 311:448-452.

Gómez E, Gutiérrez-Adán A, Díez C, Bermejo-Alvarez P, Muñoz M, Rodríguez A, Otero J, Alvarez-Viejo M, Martín M, Carrocera S, Caamaño JN (2009). Biological differences between in vitro produced bovine embryos and parthenotes. *Reproduction*. 137:285-295.

Muñoz M, Rodriguez A, Díez C, Caamaño JN, Fernández-Sánchez MT, Pérez-Gómez A, de Frutos C, Facal N, Gómez E (2009). Tyrosine kinase A, C and fibroblast growth factor-2 receptors in bovine embryos cultured in vitro. *Theriogenology*, 71:2005-2010