

1. Institution

Department of Animal Reproduction, National Institute for Agricultural and Food Research and Technology (INIA), Madrid, Spain

2. Principal investigator and contact person

Alfonso Gutierrez-Adan (agutierr@inia.es) <http://wwwsp.inia.es/EN-US/INVESTIGACION/DEPARTAMENTOS/REPRODUCCION%20ANIMAL/GRPINV/EMBMOL/Paginas/Introduccion.aspx>

3. Key personnel

NAME	EMAIL	RESEARCH AREA DETAILS
Miguel Angel Ramirez de Paz	ramirez@inia.es	Embryonic Stem cell, reprogramming, transgenesis
Raul Fernandez Gonzalez	raulfg@inia.es	Epigenetic, Developmental origin of health and diseases
Eva Pericuesta Camacho	pcamacho@inia.es	Germinal stem cell, trophoctoderm stem cells
Alexandra Calle Arias	alexandra.calle@inia.es	Transgenerational epigenetic, sex distortion

4. Research profile

Our laboratory is focused on three inter-related areas of research: 1) Understanding early decisions in embryo development: comprehend the genetic and epigenetic mechanisms that controls the preimplantation embryo development in vivo and in vitro, their developmental plasticity/vulnerability/stochastic variability, and analyze the genetic and epigenetic alterations produced by the techniques of in vitro manipulation, and their long term and transgenerational effect. 2) Examining genetic and epigenetic requirements for formation, reprogramming, and differentiation of the embryonic and adult stem cells. 3) Innovate and develop new transgenic technologies as transgenic mediated by ICSI, spermatozoa, and F0 embryonic stem cells mice.

5. Key technologies and tools

Embryo manipulation, transgenesis in laboratory and large animals, transcriptome analysis, genomic and epigenomic analysis, embryonic and trophoctoderm stem cell, sex ratio and embryo development.

6. Selected publications (max. 5):

- Fernández-Gonzalez, R. Moreira, P, Bilbao, A., Jimenez, A., Pérez-Crespo, M., Ramirez, MA,, Rodríguez De Fonseca, F., Pintado, B. and Gutiérrez-Adán, A. (2004) Long-term effect of in vitro culture of mouse embryos with serum on mRNA expression of imprinting genes, development, and behaviour. *Proceeding of the National Academic of Science* 16:5880-5885.
- P. Bermejo-Álvarez, D. Rizos, D. Rath, P. Lonergan, and A. Gutierrez-Adan (2008) Epigenetic differences between male and female bovine blastocysts produced in vitro. *Physiological Genomics* 32 (2) 264-272.
- R Fernández-Gonzalez, P Moreira, M Pérez-Crespo, M Sánchez-Martín, MA Ramirez, E Pericuesta, A Bilbao, P Bermejo-Alvarez, J de Dios Hourcade, F Rodríguez de Fonseca, and A Gutiérrez-Adán (2008) Long term effects of Mouse ICSI with DNA-fragmented sperm on health and behavior of adult offspring. *Biology of Reproduction* 78: 761-772.
- Bermejo-Alvarez P., Rizos D., Rath D., Lonergan P. and Gutierrez-Adan A (2010) Sex determines the expression level of one third of the actively expressed genes in bovine blastocysts. *Proceeding of the National Academic of Science* 107(8): 3394-3399.
- A. Miranda, E. Pericuesta, M.A. Ramírez and A. Gutierrez-Adán (2011) Prion protein expression regulates embryonic stem cell pluripotency and differentiation. *PLoS ONE* 6(4) e18422