

## 1. Institution

University of Murcia Department of Physiology. Faculty of Veterinary. Murcia 30071. Spain.

## 2. Principal investigator and contact person

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## 3. Key personnel

NAME	EMAIL	RESEARCH AREA DETAILS
Francisco A. Garcia-Vazquez	fagarcia@um.es	ICSI, embryo transfer, sperm function, transgenesis
Joaquín Gadea	jpgadea@um.es	Sperm function, cryobiology, flow cytometry, transgenesis
Salvador Ruiz	sruiz@um.es	OPU, embryo production
Raquel Romar	rromar@um.es	Cortical granules, polyspermy
Carmen Matás	cmatas@um.es	IVF, epididymal sperm storage, sperm capacitation

## 4. Research profile

The general research interest of the group is the improvement of the in vitro fertilization efficiency in livestock species and human as well as its application to different fields. With this purpose, we investigate the role of several molecules present in the oviduct during in vivo fertilization (coming either from the epithelial secretion or from the gametes) and try to transfer this knowledge to the fertilization methods in the laboratory. Our work is specially focused on the block to polyspermy and the search for answers related to the different efficiency of such a block under in vivo and in vitro conditions. We have proposed the existence of an oviductal mechanism regulating polyspermy by modifying the zona pellucida in ungulates that does not seem to occur in the mouse model. The final objective of our research is to apply the results in the production of transgenic piglets of interest in biomedicine and in the recovery of an endangered bovine local breed.

## 5. Key technologies and tools

IVF (including ICSI) and IVC of embryos (pig, bovine), oviduct cell culture and oviductal fluid obtention, flow cytometry, cryopreservation, fluorimetric assessment of sperm intracellular  $Ca^{2+}$ , cell biology techniques, surgical facilities available for pig, facilities in the general services of the University of Murcia for proteomic and genomic analysis.

## 6. Selected publications (max. 5)

Coy P, Cánovas S, Romar R, Mondéjar I, Saavedra MD, Grullón LA, Matás C, Avilés M. Oviduct-specific glycoprotein and heparin modulate sperm-zona pellucida interaction during mammalian fertilization. PNAS 105 (41) 15809–15814. 2008.

Carrasco LC, Romar R, Avilés M, Gadea J, Coy P. Determination of glycosidase activity in porcine oviductal fluid at the different phases of the estrous cycle. Reproduction 136: 833–842. 2008.

Coy P, Grullón LA, Cánovas S, Romar R, Avilés M, Matás C. Hardening of the zona pellucida of unfertilized eggs can reduce polyspermic fertilization in the pig and cow. Reproduction. 135:19-27. 2008

Gadea J, Gumbao D, Cánovas S, García-Vázquez FA, Grullón LA, Gardón JC. Supplementation of the thawing media with reduced glutathione improves function and the in vitro fertilizing ability of frozen-thawed bull spermatozoa. Int J Andrology.; 31:40-49. 2008.

García-Roselló E, Matás C, Cánovas S, Moreira PN, Gadea J, Coy P. Influence of sperm pretreatment on the efficiency of Intracytoplasmic Sperm Injection (ICSI) in pigs. J. Androl 27(3): 268-75. 2006