1. Institution

Department of Cell Biology and Histology, Faculty of Medicine, University of Murcia, Murcia, 30071. Spain.

2. Principal investigator and contact person

Manuel Avilés (maviles@um.es). Tel: 34 868884385

3. Key personnel

NAME	EMAIL	RESEARCH AREA DETAILS
María José Izquierdo-Rico	mjoseir@um.es	Zona pellucida composition and phylogeny of the ZP
María Teresa Zomeño	teresazome@um.es	Human sperm acrosome reaction and capacitation
Emilio Gómez	emiliogomez@um.es	Human in vitro fertilization

4. Research profile

The general research interest of the group is the understanding of the molecular mechanisms involved in the mammalian gamete interaction and fertilization. We are directly involved in different aspects of the cell biology of the zona pellucida (ZP): composition, structure, ZP glycoproteins functions, sperm interaction, block to polyspermy and zona pellucida maturation. A comparative analysis of the ZP proteins of the different species is also addressed to investigate the species-specific gamete interaction. Different models are used including the human beings.

5. Key technologies and tools

Transmission electron microscopy, ultrastructural gold immunocytochemistry, light microscopy, immunocytochemistry, SDS-PAGE electrophoresis and Western-blot. Proteomics analysis, zona pellucida purification, PCR, phylogenetic analysis, gene identification, cloning and recombinant proteins.

6. Selected publications (max. 5)

.- Izquierdo-Rico MJ, Jiménez-Movilla M, Llop E, Pérez-Oliva AB, Ballesta J, Gutiérrez-Gallego R, Jiménez Cervantes, Avilés M. Hamster zona pellucida is formed by four glycoproteins: ZP1, ZP2, ZP3 and ZP4. J Proteome Research 8(2):926-4. 2009

.- 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

.- 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

.- Hoodbhoy T, Avilés M, Baibakov B, Epifano O, Jiménez-Movilla M, Gauthier L, Dean J. ZP2 and ZP3 traffick independently within oocytes prior to assembly into the extracellular zona pellucida. Molecular and Cellular Biology 26(21):7991-7998. 2006

.- M. Jiménez-Movilla, M. Avilés, M.J. Gómez-Torres, P.J. Fernández-Colom, MT Castells, J. de Juan, A. Romeu, J. Ballesta. Carbohydrate analysis of the zona pellucida and cortical granules of human oocytes by means of ultrastructural cytochemistry. Human Reproduction 19: 1842-

1855. 2004