

1. Institution

Reproductive Biology Unit (RBU), Department of Reproduction, Obstetrics and Herd health, Faculty of Veterinary Medicine, Ugent, Salisburylaan 133, B-9820 Merelbeke, Belgium

<http://www.ugent.be/en/departments?ugentid=DI08> ; <http://www.rohh.ugent.be/>

2. Principal investigator and contact person

Ann Van Soom (ann.vansoom@Ugent.be) - embryology

3. Key personnel

Tom Rijsselaere	tom.rijsselaere@Ugent.be	Spermatology, Maternal interaction with Gametes
Leen Vandaele	leen.vandaele@Ugent.be	Immunofluorescence, Apoptosis
Karen Goossens	karen.goossens@Ugent.be	Genomics, RNA-interference
Mirjan Thys	mirjan.thys@Ugent.be	Glycobiology, Sperm-oocyte interaction
Jo Bijttebier	jo.bijttebier@Ugent.be	Proteomics, Sperm-oocyte interaction
Muriel Filliers	muriel.filliers@Ugent.be	Genomics, Maternal interaction with Embryos
Katrien Smits	katrien.smits@Ugent.be	Genomics, Maternal interaction with Embryos
Mohamed Shehab-El-Deen	MohamedAhmed.ShehabElDeen@Ugent.be	Metabolomics, Maternal interaction with Gametes and Embryos
Catharina de Schauwer	catharina.deschauwer@Ugent.be	Adult stem cell culture

4. Research profile

We seek to find the answer to two questions: “How do embryos differentiate from a unicellular zygote to a multicellular blastocyst” and “How does the sperm cell enter the oocyte”. Embryonic differentiation is investigated in vitro with in vivo embryos as a golden standard (maternal interaction). Several animal models (cattle, pigs, horses, cats) are being used which yields additional information from a comparative point of view. We have established non-invasive and invasive criteria for embryo quality using morphology, timing of development and immunofluorescence. At present we are, in collaboration with the Lab for Animal Genetics (Luc Peelman), identifying genes which are differentially expressed in embryos either derived in vivo or in vitro (suppressive subtractive hybridisation, real-time PCR), and by using in vivo models we try, in collaboration with other labs, to identify key molecules (proteomics, recombinant proteins, RNA interference) which are involved in embryonic differentiation. Our second focus is on sperm-egg interaction, which is modulated by (glyco)proteins and enzymes: we have developed competition/inhibitory assays to study fertilization and block to polyspermy.

5. Key technologies and tools

Immunofluorescence and immunohistochemistry- (transcriptomics) - (proteomics) - in vitro production of embryos (bovine, pig, horse, cat)- computer assisted sperm analysis - somatic cell cultures

6. Selected publications (max. 5)

1. GOOSSENS K, VAN SOOM A, VAN POUCKE M, VANDAELE L, VANDESOMPELE J, VAN ZEVEREN A, PEELMAN L. (2007) Identification and expression analysis of genes associated with bovine blastocyst formation. *BMC developmental biology* 7:64--doi:10.1186/1471-213X-7-64 .
2. VANDAELE L, MATEUSEN B, MAES D, DE KRUIF A., VAN SOOM A. (2007) Temporal detection of caspase-3 and -7 in bovine in vitro produced embryos of different developmental capacity. *Reproduction* 133: 709-718 .
3. GOOSSENS K., VAN POUCKE M., VAN SOOM A., VANDÉSOMPELE J, VAN ZEVEREN A., PEELMAN L.J. (2005) Selection of reference genes for quantitative real-time PCR in bovine preimplantation embryos. *BMC Developmental Biology* 5:27 (03 Dec 2005)
4. MATEUSEN B, VAN SOOM A., MAES D, DONNAY I, DUCHATEAU L, LEQUARRE A-S (2005) Porcine embryo development, fragmentation and its relation to apoptotic markers: a cinematographic and confocal laser scanning microscopic study. *Reproduction* 129: 443-452
5. RIJSSELAERE T, VAN SOOM A, VAN CRUCHTEN S, CORYN M, GÖRTZ K, MAES D, DE KRUIF A (2004) Sperm distribution in the genital tract of the bitch following artificial insemination in relation to time of ovulation. *Reproduction* 128, 801-811