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3. Key personnel

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Karen Goossens	karen.goossens@ugent.be	Molecular biology, embryology
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4. Research profile : We seek to find the answer to the question: "How do embryos differentiate from a unicellular zygote to a multicellular blastocyst". Embryonic differentiation is investigated *in vitro* with *in vivo* embryos as a golden standard (maternal interaction), by making use of several animal models (cattle, pigs, horses, human) which yields additional information from a comparative point of view. We have previously shown that bovine embryo differentiation is affected by the culture environment (MRD 1996 45(2):171-82) and by the maternal tract (BOR 1997 57(5)**:** 1041-1049). We are using at present transcriptomic and proteomic approaches to identify key signaling molecules involved in differentiation to the inner cell mass and trophectoderm. Recently we have also demonstrated the impact of stress on oocyte quality and spermatogenesis in cattle, with concurrent effects on the resulting blastocysts. The underlying epigenetic mechanisms related to these findings are at present under investigation.

5. Key technologies and tools

- Mammalian embryo culture (cow, pig, horse)
- Cell culture – primary and cell lines
- Quantitative RT-PCR
- Immunofluorescence (qualitative and quantitative)
- Cryopreservation of oocyts,semen and embryos

6. Selected publications (max. 5)

1. Van Soom A, Boerjan Ml, Ysebaert MT, De Kruif A. (1996) Cell allocation to the inner cell mass and the trophectoderm in bovine embryos cultured in two different media. Mol Reprod Dev 45:171-182
2. Opsomer G, Grohn YT, Hertl J, Coryn M, Deluyker H, de Kruif A. (2000) Risk factors for postpartum ovarian dysfunction in high producing dairy cows in Belgium: A field study. Theriogenology 53: 841-857
3. Goossens K., Van Poucke M., Van Soom A., Vandesompele 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
4. Filliers M, De Spiegelaere W, Peelman L, Goossens K, Burvenich C, Vandaele L, Cornillie P, Van Soom A. (2011) Laser capture microdissection for gene expression analysis of inner cell mass and trophectoderm from blastocysts. Anal Biochem. 408(1):169-71.
5. Smits K, Govaere J, Peelman LJ, Goossens K, de Graaf DC, Vercauteren D, Vandaele L, Hoogewijs M, Wydooghe E, Stout T, Van Soom A. (2011) Influence of the uterine environment on the development of *in vitro* produced equine embryos. Reproduction143: 1–10