

1. Institution

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4. Research profiles

- Female metabolism and gametes differentiation: The female metabolism deeply impact reproductive efficiency. In the ovary, molecular sensors of circulating metabolites could regulate both somatic cells and oocyte functions. High yielding cows, known to display post partum fertility failures are used to study these interactions.
- Role of the dialog between oocyte and somatic follicular cells in the regulation of folliculogenesis and oocyte differentiation: Oocyte differentiation, from the primordial follicle stage up to ovulation, relies on a permanent and highly regulated dialog between oocyte and surrounding granulosa cells. In vitro models are developed for a better understanding of this dialog.
- Oviduct support of early embryo development: In vitro developed embryos display metabolic defects translating into lower viability after cryopreservation. Oviduct cell support during early development could improve their quality. Mechanisms of this embryo / oviduct communications are under study.
- Phylogenomic of placenta specific genes: preliminary studies show that genome of each mammalian species contains a specific set of genes specifically expressed in the placenta. This may account for functional and histological dramatic differences that exist between placenta in mammals.

5. Key technologies and Tools

Our team is currently producing and using (cryopreservation, transfer) embryos in vivo and in vitro in different species including cattle, sheep, goat, pig, horse and deers. Large animal facilities are available locally with cattle, sheep, goat pig and horse herds devoted to experimentation. Surgical facilities are available on site, as well as INRA slaughterhouse to allow tissues collection within minimum delay. The laboratory is well equipped for all cell and molecular biology techniques including high throughput transcriptomic and proteomic (mass spectrometry, Biacore) studies.

6. Selected publication (max. 5)

Uzbekova S, Arlot-Bonnemains Y, Dupont J, Dalbiès-Tran R, Papillier P, Penner S, Thélie A, Perreau C, Mermillod P, Prigent C, Uzbekov R. Spatio-Temporal Expression Patterns of Aurora Kinases A, B, and C and Cytoplasmic Polyadenylation-Element-Binding Protein in Bovine Oocytes During Meiotic Maturation (2008). *Biol Reprod*, 78(2):218-33.

Thelie A, Papillier P, Penner S, Perreau C, Traverso JM, Uzbekova S, Mermillod P, Joly C, Humblot P, Dalbies-Tran R. Differential regulation of abundance and deadenylation of maternal transcripts during bovine oocyte maturation in vitro and in vivo (2007). *BMC Dev Biol*, 7 (1) : 125.

Tosca L, Uzbekova S, Chabrolle C, Dupont J. Possible role of 5'AMP-activated protein kinase in the metformin-mediated arrest of bovine oocytes at the germinal vesicle stage during in vitro maturation. *Biol Reprod* 2007; 77: 452-465.

Rodriguez-Dorta N, Cognié Y, Gonzalez F, Poulin N, Guignot F, Touzé J-L, Baril G, Cabreroa F, Alamo D, Batista M, Gracia A and Mermillod P. Effect of coculture on oviduct epithelial cells on viability after transfer of vitrified in vitro produced goat embryos (2007). *Theriogenology*, 68 :908-913.

Locatelli Y, Vallet J-C, Huyghe F P, Cognié Y, Legendre X and Mermillod P (2006). Laparoscopic ovum pick up and in vitro production of sika deer embryos: effect of season and culture conditions. *Theriogenology*, 66 (5) :1334-1342.