

Research title:

Placental progenitor cells and their derived acellular products for regenerative treatments to reverse ovarian failure in large animal models

Impiego di cellule progenitrici placentari e dei loro derivati acellulari per il trattamenti rigenerativo dell'ipoplasia ovarica nel modello grandi animali

Tutor: **Prof. Fausto Cremonesi**

Co-Tutor: **Prof.ssa Anna Lange Consiglio**

Contact details

Prof. Fausto Cremonesi, DVM

Department of Veterinary Medicine and Centro Clinico-Veterinario e Zootecnico-Sperimentale di Ateneo

Email: fausto.cremonesi@unimi.it

<http://www.dimevet.unimi.it/ecm/home>

State of the art and aims of the project

The frequency of reproductive disorders is mainly due to ovarian abnormalities. Mesenchymal stem cells (MSCs) could restore partial ovarian function after transplantation as shown in mice with ovarian failure caused by chemotherapy. The present study is aimed to evaluate the efficacy of amniotic progenitor cells (AMCs) and their acellular products (conditioned media, CM; and microvesicles, MVs) in the therapy of cows with ovarian failure.

Steps:

- 1) Characterization of CM and MVs including the library of microRNA.
- 2) Collection of samples of ovarian tissue derived from bovine affected by ovarian failure and cultured with AMCs or CM or MVs.
- 3) Treatment of animals affected by ovarian failure with AMCs, CM and MVs by ultrasound intraovarian injection. Detection of serum estradiol, progesterone and Antimüllerian hormone concentrations. Breeding experiments with frozen semen in animal eventually detected in oestrus. Evaluation of pregnancy rate and live calves.

Recent publications of the tutor in the field

1. Perrini C., Esposti P., Cremonesi F., Lange Consiglio A. Secretome derived from different cell lines in bovine in vitro embryo production. *Reproduction Fertility and Development* 2018, 30 (4): 658-671.
2. Perrini C., Strillacci MG., Bagnato A., Esposti P., Marini MG., Corradetti B., Bizzaro D., Idda A., Ledda S., Capra E., Pizzi F., Lange-Consiglio A., Cremonesi F. Microvesicles secreted from equine amniotic-derived cells and their potential role in reducing inflammation in endometrial cells in an in vitro model. *Stem Cell Research and Therapy* 2016, : 1-15.
3. Corradetti B., Correani A., Romaldini A., Marini M.G, Bizzaro D., Perrini C., Cremonesi F., Lange-Consiglio A. Amniotic membrane-derived mesenchymal cells and their conditioned media: potential candidates for uterine regenerative therapy in the horse. *PLoS ONE*, 2014, 9 (10): e111324.
4. Lange-Consiglio A., Rossi D., Tassan S., Perego R., Cremonesi F., Parolini O. Conditioned medium from horse amniotic membrane-derived multipotent progenitor cells: Immunomodulatory activity in vitro and first clinical application in tendon and ligament injuries in vivo. *Stem Cells and Development* 2013; 22(22): 3015-3024.
5. Lange-Consiglio A., Tassan S., Corradetti B., Meucci A., Perego R., Bizzaro D., Cremonesi F. Investigating the efficacy of amnion-derived compared with bone marrow-derived mesenchymal stromal cells in equine tendon and ligament injuries. *Cytherapy* 2013; 15(8):1011-1020.