THE VITELINE ENIGMA

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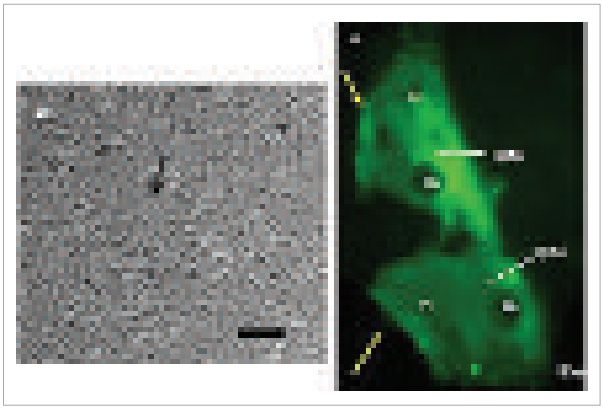

Figure1. Immunofluorescence: positive for the antibody OCT-3 / 4 of the yolk sac cells of canine

The successive stages of pregnancy are characterized by two clear and distinct steps. The first one is related to early pregnancy in humans and corresponds to the first 3 months of pregnancy. During this period, important events occur, such as embryogenesis, organogenesis and placentation. Evidence found in animal models suggest that this phase of development is susceptible to some problems that may reflect the early pregnancy loss, and other effects compromising the pregnancy. The second phase corresponds to fetal development. Relations and regulation of the functional mechanisms involved in early pregnancy are not fully known, and many of them are coincident. The yolk sac is the only embryonic Annex present in all species. Complemented by other structures in viviparous, it is still unknown, among their functions, the mechanisms related to their actions and relations with the issue tropism nutrition, embryogenesis, placentation and organogenesis. Initially the group will focus on morpho-functional analysis related to sac activity in animal models showing vitelline placentation compared to those without vitelline placentation. Calf proteomics analysis, the mechanism of inversion sac absorption, insight, expertise and yolk transport will also be discussed. Yolk cells or yolk precursors are cultured in order to be able to establish yolk cell lines, and to study the *in vitro* vitellin cellular plasticity, including preclinical testing of cell therapy in genetic or acquired diseases in animals.

SUMMARY OF RESULTS TO DATE AND PERSPECTIVES

The yolk sac is the only embryonic structure present in all species. Our group will focus on analysis related to sac morphofunctional activity in animal models that have or have not vitelline placentation. A proteomic study of calf proteins, yolk sac proteins and primitive gut proteins are being held in embryos, to identify proteins and their functional aspects, as well as their changes after transduction. These information will contribute to the understanding maternal-fetal and to the improvement of biotechnologies such as artificial insemination and embryo transfer. The establishment and characterization of progenitor stem cells in horses supports joints diseases studies and the therapeutic perspectives for veterinary regenerative nerve and tendon injuries, arthritis and ruptured ligament braces. At the same specie, the potential of horse yolk sac pluripotent stem cells for differentiation into pancreatic cells in order to produce insulin for treatment of diseases. Dogs and horses embryos yolk sac stem cells have been differentiate in hematopoietic cell lines and endothelial cells, to elucidate problems related to blood diseases and to help heart transplants, vascular regeneration and repopulation of hematopoietic systems affected by disease. Finally, the characterization and differentiation of embryonic liver bud stem cells to establish liver cell lines for liver diseases treatment in animal models.

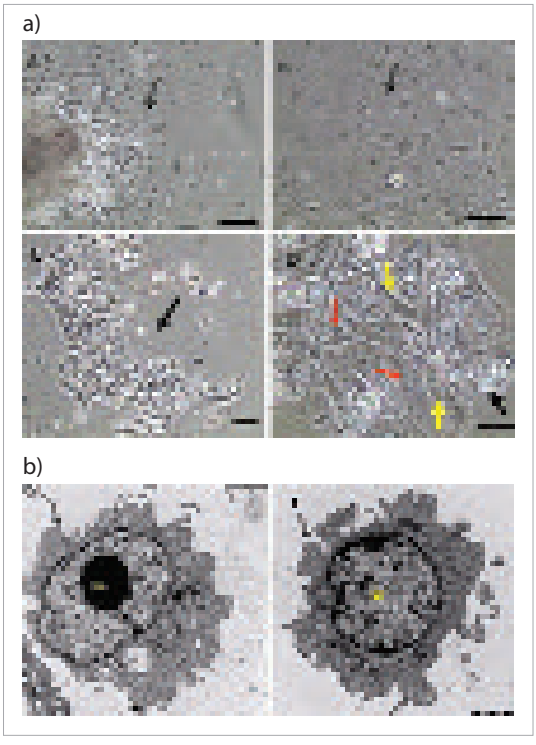

Figure 2. (a) Morphological diversity of canine yolk sac stem cells with 45 days. (b) Electron transmission of progenitor cells derived from the cultivation of canine yolk sac cells with 30 days of gestation

MAIN PUBLICATIONS

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