PL

Project title:
The role of PAQR receptors in the regulation of the corpus luteum function in cow

Konkurs: OPUS 29

PI of the project: dr hab. Magdalena Kowalik

Project description:
The aim of this project is to determine the role of P4 membrane receptors type PAQRs (progestin and adipoQ receptors) in the functioning of the bovine corpus luteum. In this aim, we plan to characterize the coexistence profile of different membrane progesterone receptors in the bovine ovary. Next we will be identify factors that may regulate the expression of these receptors in CL cells. Following we perform functional analyses to determine the involvement of PAQRs in steroidogenesis, prostaglandin secretion, angiogenesis, and apoptosis of luteal and vascular endothelial cells of the CL. Finally, we will verify the molecular mechanisms underlying P4/PAQR action in bovine CL cells by identifying the genes, proteins, and protein kinase pathways involved in this process.
In this project proposal, we will plan to characterize the coexistence profile of different membrane progesterone receptors in the cow ovary. Next, we will determine the factors that can regulate the expression of these receptors in CL cells. We will perform functional analyses to determine the participation of PAQRs in steroidogenesis, prostaglandin secretion, angiogenesis and apoptosis processes in luteal and endothelial cells of the CL. Finally, we will verify the molecular mechanisms underlying the action of P4/PAQR in bovine CL cells by identifying genes, proteins and protein kinase pathways involved in this process. The proposed studies are basic, however important for the understanding of female fertility disorders. We hope to collect new data on the participation of PAQR in the regulation of CL function, which may help to better understand of the mechanism of P4 effect on the regulation of the estrous cycle and protection of early pregnancy. Proper functioning of the CL is crucial for mammalian reproduction and disorders in CL activity might be a cause of improper endometrium development as well as problems with the embryo implantation and early miscarriages. Therefore, understanding the mechanisms regulating the function of this organ, at the level of cellular and subcellular regulation, may also have some practical significance in medical and veterinary practice. Moreover, understanding the relationship between the genomic and non-genomic effects of P4 in cells may facilitate the identification of molecular causes of some cases of female infertility.

Description of tasks:

As part of the project, the PhD student will be involved in research involving:

- participation in in vitro experiments (working with primary cells and cell lines), including cell stimulation and transfection,
- laboratory analyses: PCR, Western Blot, IHC/IF, RNAscope HiPlex, ELISA, analysis of proliferation, angiogenesis, migration, and apoptosis processes in the studied cells,
- participation in the analysis of NGS-RNA-seq and LCMS/MS results,
- statistical analysis of results,
- participation in the preparation of abstracts and manuscripts for scientific papers,
- active participation in scientific conferences.

Requirements:

1. Master thesis accomplishment – life science degree (biology, biotechnology, animal husbandry, veterinary) or other related to the discipline of animal science;
2. Knowledge in the field of reproductive biology and animal physiology;
3. Knowledge in basic molecular biology methods (e.g. Real-Time PCR, Western blot) and/or cell culture methods, microscopic techniques as well as in statistical analyses;
4. Knowledge in basic in vitro laboratory with primary cells or cell lines will be additional adventage
5. Availability and willingness for gathering of the animal material for experiments; ability to work with primary cells;
6. Good command of English enabling communication, independent manuscript preparation and presentation at international conferences;
7. Willingness to undertake a research internship at a foreign research institution;
8. High motivation for scientific work, good analytical and work organization skills, both individual and team work skills.

Selection process:

- Applications will be assessed in accordance with the criteria set out in the regulations for awarding research scholarships in research projects financed by the National Science Centre;
- Only online applications will be considered;
- Candidates evaluated with the highest score will be invited to an actual interview, which will take place face-to-face or online;
- During the interview, the candidate will be asked to deliver a 10-minute presentation on their Master's thesis and research interests;
- The final recruitment results will be published on InLife webpage within 10 days after final decision;

Important information:

- **Application submission period:** 20 July 2026 (until 23:59 CEST)
- **Application method:** application form
- **Interviews:** July 24-31, 2026
- **Location:** Olsztyn, Poland
- **Duration of the scholarship:** 48 months
- **Expected start date:** October 1st, 2026
- **Number of positions:** 1