Česká zemědělská univerzita v Praze
Fakulta agrobiologie, potravinových a přírodních zdrojů

DOKTORSKÝ STUDIJNÍ PROGRAM

NÁVRH TÉMATU/PROPOSAL OF THEME

Studijní program/*Study Program*: **Animal Science**

Studijní obor/*Branch of Study*: **General Animal Science**

Katedra/*Department of*: **Veterinary Sciences**

Školitel (včetně titulů), email/*Supervisor*, email: Markéta Sedmíková, Ph.D., professor

Konzultant (včetně titulů)/*Co-supervisor*: Eva Chmelíková, Ph.D., associate professor

Forma studia/*Form of Study*: **Full_time**

Typ tématu/*Type of Theme:* **Framework**

Téma/*Theme:* Factors influencing meiotic maturation, activation and aging of porcine oocytes in *in vitro* culture systems.

Hypotéza/*Hypothesis*:

Detailed knowledge of the process of meiotic maturation, activation and aging of porcine oocytes will enable their influencing in *in vitro* culture systems in a way that promotes the use of *in vitro* cultured oocytes in reproductive biotechnologies of pigs.

Anotace/Annotation:

Reproductive biotechnologies allow in genetically valuable individuals to fully exploit their genetic potential and are therefore widely used in livestock. They are well developed especially in cattle, but in pigs a number of species-specific problems that have not yet been satisfactorily solved limits their use. These include, for example, polyspermy during *in vitro* fertilization and the difficulty to freeze gametes, limiting IVF utility, cryopreservation of oocytes, sperms and embryos (Santos, R.R., Reprod. Biol. Endocrinol.; 2014; Romar, R. *et al.* Theriogenology, 2019).
Porcine cumulus-oocyte complexes obtained from ovaries of sows slaughtered in slaughterhouses will be matured under *in vitro* conditions. Their nuclear and cytoplasmic maturation and their possible influencing will be studied. *In vitro* matured oocytes will be activated, *in vitro* fertilized or exposed to prolonged culture according to the specific focus of the experiments. Orcein or DAPI staining will be used for nuclear maturation evaluation, immunocytochemical methods (Western blot and immunolocalization), fluorescence and confocal microscopy and image analysis will be used for protein determination (e.g. Nemecek, D. *et.al*., Peer J, 2017). Enzyme activity will be monitored using protein kinase assays (Tůmová, L. *et al*., Animal, 2016).

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Podpis/*Signature:*