Study programme(s): Doctoral Level: Course title: Molecular regulation of the ovarian function Lecturer: Nebojsa Andric, PhD Status: Elective ECTS:

Requirements:

Learning objectives

The course provides knowledge about molecular mechanisms in regulation of the mammalian ovarian function.

Learning outcomes

After complition of the course, it is expected that students (i) gain knowledge about molecular mechanisms that control folliculogenesis and functions of adult ovary (ii) understand and follow research in the filed of female reproductive endocrinology.

Syllabus

Theoretical instruction

Mechanisms that control early folliculogenesis. Gonadotropins regulation of the ovarian function. Autocrine and paracrine regulation of the ovary. Molecular control of the ovulation. Ovarian function and failure: The role of oocyte and its molecules. Molecular control of corpus luteum.

Practical instruction

Experimental models: primary culture of immature and preovulatory granulosa cells; analysis of signlaning pathways activity after stimulation with gonadotropin hormones in different experimental conditions; analysis of the results and preparation of manuscripts

Literature

Gougeon A (1996) Regulation of ovarian follicular development in primates: facts and hypotheses. Endocr Rev 17:121-155.; Adhikari, D. and Liu, K. (2009) Molecular mechanisms underlying the activation of mammalian primordial follicles, Endocrine reviews 30(5): 438-64.; Reddy, P., Liu, L., Adhikari, D., Jagarlamudi, K., Rajareddy, S., Shen, Y., Du, C., Tang, W., Hamalainen, T., Peng, S. L. et al. (2008) Oocyte-specific deletion of Pten causes premature activation of the primordial follicle pool', Science 319(5863): 611-3.; Richards, J. S. and Pangas, S. A. (2010) 'The ovary: basic biology and clinical implications', J Clin Invest 120(4): 963-72.; Richards, J. S. and Pangas, S. A. (2011) 'New insights into ovarian function', Handb Exp Pharmacol (198): 3-27.; Fan, H. Y., Liu, Z., Shimada, M., Sterneck, E., Johnson, P. F., Hedrick, S. M. and Richards, J. S. (2009) 'MAPK3/1 (ERK1/2) in ovarian granulosa cells are essential for female fertility', Science 324(5929): 938-41.; Hunzicker-Dunn M, Maizels ET (2006) FSH signaling pathways in immature granulosa cells that regulate target gene expression: branching out from protein kinase A. Cell Signal 18:1351-1359.;

Russell DL, Robker RL (2007) Molecular mechanisms of ovulation: co-ordination through the cumulus complex. Hum Reprod Update 13:289-312. Weekly teaching load

Other:

Weekly teaching load				o ther.
Lectures:	Exercises:	Other forms of teaching:	Student research:	
Teaching methodology				
Lectures, experimental work, analysis and presentation of experimental results, presentation of the articles				
from the filed of the female reproductive endocrinology (journal club)				
Grading method (maximal number of points 100)				
Experimental work – 40 points				
Presentation of the results – 10 points				
Exam-	5	50 points		