

Study programme: PhD in Biology				
Level: Doctoral degree				
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 completion 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 field of female reproductive endocrinology.				
Syllabus <i>Theoretical instruction</i> 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. <i>Practical instruction</i> Experimental models: primary culture of immature and preovulatory granulosa cells; analysis of signaling 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. <i>Endocr Rev</i> 17:121-155.; Adhikari, D. and Liu, K. (2009) Molecular mechanisms underlying the activation of mammalian primordial follicles, <i>Endocrine reviews</i> 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', <i>Science</i> 319(5863): 611-3.; Richards, J. S. and Pangas, S. A. (2010) 'The ovary: basic biology and clinical implications', <i>J Clin Invest</i> 120(4): 963-72.; Richards, J. S. and Pangas, S. A. (2011) 'New insights into ovarian function', <i>Handb Exp Pharmacol</i> (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', <i>Science</i> 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. <i>Cell Signal</i> 18:1351-1359.; Russell DL, Robker RL (2007) Molecular mechanisms of ovulation: co-ordination through the cumulus complex. <i>Hum Reprod Update</i> 13:289-312.				
Weekly teaching load				Other:
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 field 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- 50 points				