

Study program : REPRODUCTIVE BIOLOGY			
Name of course: Assisted reproductive technologies			
Lecturer: Jelena Vukosavljević, Slobodanka Vakanjac, Anita Radovanović			
Status of course : obligatory			
Number of EPSB: 7			
Requirement: -			
Aim of course Aim of course is introduction of students with assisted reproductive technologies (ART) which are used for the purpose of infertility treatment.			
Outcome of course After successfully implemented examination and pre-examination obligations, student should be familiar with basic fertilization techniques: intracytoplasmatic sperm injection and conventional insemination method of fertilization; sperm analysis and preparation of sperm for fertilization; oocyte identification in follicular fluid and oocyte preparation for fertilization. Student should have insight into embryo selection methods and embryotransfer procedure; to be acquainted with basics of gamete and embryo cooling and warming procedure in vitrification; basics of polar body, blastomere and trophoectoderm biopsy techniques for preimplantation genetic diagnosis/screening; to be able to collect, process and record data and laboratory protocols.			
Content of course <i>Theory</i> Introduction with necessary terms required in laboratory involved in assisted reproductive technologies: culture conditions, staff, equipment and basic ART techniques (sperm analysis; preparation of gametes for fertilization; methods of fertilization: insemination of oocytes with processed sperm- cIVF and intracytoplasmatic sperm injection- ICSI; cultivation and assesment of oocytes and embryos through each development stage; embryo selection and embryotransfer); assisted hatching, time-lapse monitoring system, polar body/blastomere/trophoectoderm biopsy for preimplantation genetic diagnosis/screening; laboratory safety and appropriate infectious agents and biological material handling (protective measures for personel and patients); identification of patients and their gametes, zygotes and embryos; detailed evaluation and discution of indicators in order to improve quality and outcome of ART; cryopreservation methods of gametes and embryos in all stages of development; basics of oocyte in vitro maturation; gamete and embryo donation, cryobanking; legal and ethical aspects of ART; record keeping and quality control. Asisted reproductive biotechnology in domestic animals. Ethical aspects of animal biotechnology. <i>Practice</i> Practical teaching will be held at the Department of human reproduction, a teaching base of Medical Faculty. Each student will observe current ART procedures implemented at the Department of human reproduction. Students will be introduced in organisation management of IVF laboratory. For practical skills acquisition, human biological material aproved for scientific and experimental purpose will be used. Students will practice basic fertilization techniques: intracytoplasmatic sperm injection and conventional method of fertilization; sperm analysis and sperm preparation for fertilization; oocyte identification in follicular fluid and preparation of oocytes for fertilization. Embryo selection methods and embryotransfer procedure will be enabled for practicing of students, as well as basics of gamete and embryo vitrification and warming, biopsy of polar body, blastomere and trophoectoderm for preimplantation genetic diagnosis/screening. Students will gain knowledge about recording of data and laboratory protocols, and they will be introduced in necessary protective measures in order to keepinf safety of personel, patients and biological materials.			
Literature 1. Gardner D., Weissman A., Howles C., Shoham Z. (2004) Textbook of Assisted reproductive Technologies, 3 rd edition, Informa Healthcare 2. Alpha Scientists in Reproductive Medicine and ESHRE Special Interest Group of Embryology (2011) The Istanbul consensus workshop on embryo assessment: proceedings of an expert meeting, Human reproduction, 26: 1270-1283 3. Magli C., Abbeel E., Lundin K., Royere D., Van der Elst J., Gianaroli L. (2008) Revised guidelines for good practice in IVF laboratories, Human Reproduction, 23: 1253-1262 4. ESHRE Guideline Group on good practice in IVF labs (2015) Revised guidelines for good practice in IVF laboratories, European Society of Human reproduction and Embryology 5. World Health Organization (1999) WHO LABORATORY MANUAL for the examination of human semen and sperm-cervical mucus interaction, 4 th edition, Cambridge University Press 6. World Health Organization (2010) Examination and processing of human semen, 5 th edition, WHO Press 7. Magli C., Jones G., Lundin K., Van den Abbeel E., The Special Interest Group of Embryology (2012) Atlas of Human Embryology: from Oocytes to Preimplantation Embryos, Oxford University Press 8. THE COMMISSION OF THE EUROPEAN COMMUNITIES, Commission Directive 2006/86/EC, 2004/23/EC, 2006/17/EC, www.eur-lex.europa.eu. 9. Alpha Scientists in Reproductive Medicine and ESHRE Special Interest Group of Embryology (2017) The Vienna consensus of ART laboratory performance indicators, Reproductive BioMedicine Online, 35: 494-510			
Number of active teaching classes	Theoretical: 2	Practical lectures: 0+5+0	
Teaching methods Lectures, practical work, consultation			
Exam and scoring (maximum number of pionts 100)			
Pre-exam obligation	points	Final exam	points
Activity at theory classes			
Practical classes – <i>practical work of student</i>	20	Test	60
Practical classes – <i>laboratory report</i>	20		

