

Course Unit Descriptor

Study Programme: MSc Reproductive Biology			
Course Unit Title: Introduction to the techniques of micromanipulation of gametes			
Course Unit Code: RB04			
Name of Lecturer(s): Prof. Sonja Kaišarević, PhD			
Type and Level of Studies: Master studies			
Course Status (compulsory/elective): Compulsory			
Semester (winter/summer): Winter			
Language of instruction: English			
Mode of course unit delivery (face-to-face/distance learning): face-to-face			
Number of ECTS Allocated: 5			
Prerequisites: -			
Course Aims: Gaining theoretical and practical knowledge and skills in micromanipulating using different experimental models. Gaining knowledge on basic procedures in micromanipulation of gametes, microinjecting, as well as on techniques for isolation and analyses of spermatozoa and oocytes.			
Learning Outcomes: Upon completion of the pre-examination activities and final exam, students can apply knowledge and skills related to work on micromanipulator, micromanipulation of gametes, microinjecting, as well as procedures related to isolation and analyses of spermatozoa and oocytes in laboratories for assisted reproduction and other similar laboratories.			
Syllabus: <i>Theory:</i> Micromanipulation and microinjection: definition and description of the techniques, types of micromanipulators, micropipettes, application in techniques of assisted reproduction and other procedures. Basic principles of ICSI procedure. Characteristics of spermatozoa, semen analyses. Capacitation and acrosomal reaction. Superovulation. <i>Practice:</i> Basic principles of micromanipulation. Micromanipulation and microinjection on <i>Danio rerio</i> embryo as a model: microinjection of dye, dechorionisation. Micromanipulation on artificial models. Computer simulation of ICSI procedure – adaptation of techniques of micromanipulation and ICSI procedure in a virtual system. Microscopic analysis of rat spermatozoa (determination of concentration, viability, morphology and motility of spermatozoa, staining of spermatozoa). Induction of acrosomal reaction and evaluation of the acrosome status in rat spermatozoa. Induction of superovulation in female rat, collection and observation of oocytes. Keeping a laboratory notebook.			
Required Reading: 1. Kaisarevic S. (2019) Introduction to the techniques of micromanipulation of gametes. Handbook for students at MSc studies in Reproductive Biology. University of Novi Sad, Erasmus+ CBHE program. 2. WHO laboratory manual for the examination and processing of human semen, Sixth edition, World Health Organization 2021. 3. Reviews and original scientific papers on topics related to the subject matter of the course. 4. Group of authors: Practicum in Reproduction (material provided within the course „Frontiers in Reproduction“, Marine Biological Laboratory (MBL), Woods Hole, Massachusetts, USA, 2008 и 2010). 5. Lecture presentations provided by the teacher.			
Weekly Contact Hours:	Lectures: 1	Practical work: 4	
Teaching Methods: Lectures, laboratory work, consultations			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligation	points	Final exam	points
Practical work	up to 40	oral exam	up to 40
Laboratory notebook	up to 20		