Level: master

Course title: CRYOPRESERVATION OF GAMETES AND EMBRYOS

Status: obligatory

ECTS: 3

Requirements: -

Learning objectives

Introducing students to basic principles of cryopreservation of human reproductive cells (spermatozoids and egg cells) and embryos. The course, by means of laboratory activities and theoretical instruction, offers to students new issues on cryopreservation of gametes and embryos and the instructions on avoiding cryo injuries and managing risks in cryopreservation.

Learning outcomes

After the successful completion of the examination, the student is able to: understand principles of cryobiology; recognise properties of solutions during freezing and melting processes; recognise cryoprotective agents; understand intracellular ice formation, solution effect, as well as cell injuries during freezing and avoiding them; use methods and techniques of cryopreservation of gametes and embryos; understand risks of using human gametes and embryos, but also its importance in treating infertility and preserving fertility.

Syllabus

Theoretical instruction

Basic principles of cryobiology – cryobiological processes at the cellular and molecular level. Cell injuries during intracellular formation of ice, solution effect. Intracellular vitrification. Dehydration. Cryopreservation of human reproductive cells. Cryopreservation methods of spermatozoa (physiology features of spermatozoa and their importance for cryopreservation, assessment of frozen-thawed spermatozoon' attributes). Methods of cryopreservation of egg cells (influence of the stage of maturity of egg cell, problems in cryopreservation of mature and primordial oocytes). Freezing methods of human embryos at different stages of development as well as freezing of embryos as methods to increase the successfulness in infertility treatment.

Practical instruction

Introduction to laboratory equipment necessary for cryopreservation (cryoprotectants and laboratory dishes). Mastering the techniques and freeze-thaw protocols for gametes and embryos on animal models and human biological material, approved for scientific and experimental use. Mastering the documentation. Introduction to safety measures for the frozen material.

Weekly teaching load				Other: -
Lectures: 2	Exercises:-	Other forms of teaching: 1	Student research:-	