**OBJECTIVES**

Before attending the specialized course of Biology of Gametes and IVM and IVF Techniques, students have to achieve a good knowledge on the main topics of Cell Physiology and Cell Culture. They have:

-to learn mammalian cell functions and relate them to cell structure; -to gain an understanding of the laboratory protocols to carry out common mammalian cell culture techniques; -to gain critical thinking required for cellular and physiological research.

**SYLLABUS “CELLULAR PHYSIOLOGY / CELL CULTURE”** (Prof. Luisa Gioia)

Students have to achieve the basic concepts of the main topics of Cell Physiology and Cell Culture. In detail:

§ Basic properties of cell membrane and organelles. § Mechanisms of transport of molecules across the cell membrane. Osmosis. § Electrical properties of the cell membrane. General properties of channels. Transmembrane voltage. Nerve and muscle cells: electrical signaling. The action potential and its propagation. § The nucleus. Transport to and from the nucleus. § The cell cycle and its control. The cell division: mitosis and meiosis. § Cytoskeletal structures and their function. § Intracellular signaling. § Intercellular comunication.

v The laboratory of cell culture: basic equipment and proper laboratory set-up v What is cell culture? Principles of cell colture. v Culture conditions v Sterile techniques v Characteristics of the salt solutions and the culture media. Serum v Methods and cell culture protocols: counting cells. Determine the cell viability: Trypan Blu exclusion and Live-Dead kit.

IN-DEPTH TEXTBOOKS

• Bruce Alberts et al. “Molecular Biology of the Cell”. Garland Science. Sixth edition. ISBN 978-0-8153-4432-2 (hardcover); ISBN 978-0-8153-4524-4 (loose-leaf).

• R Ian Freshney, “Culture of animal cells: a manual of basic technique and specialized applications” 6th Ed. book 2010 Wiley-Liss, Inc. New York, NY. (ITALIAN) • Bruce Alberts et al., "Biologia molecolare della cellula", Zanichelli, Quinta edizione, Bologna, Link editore ebook.www.zanichelli.it; ISBN: 9788808064516

• ITALIAN TEXTBOOK: G.L. Mariottini et al., “Introduzione alle colture cellulari” Tecniche Nuove II edizione, Milano, Link editore ebook www.tecnichenuove.com; ISBN: 9788848124331