

COURSE OBJECTIVES

The remedial course objective is to familiarize students with basic concepts of the main topics of Cell Physiology and Cell Culture. Students 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 FOR "CELLULAR PHYSIOLOGY / CELL CULTURE" REMEDIAL COURSE

(Prof. Luisa Gioia)

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

TEXTBOOKS

(ENGLISH)

- 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
- Egidio D'Angelo e Antonio Peres, "**Fisiologia - Molecole, cellule e sistemi**" - Volume 1: Principi e fisiologia cellulare Edi-Ermes srl Quinta edizione Milano Link editore ebook www.ediermes.it; ISBN: 9788870512977
- G.L. Mariottini et al., "**Introduzione alle colture cellulari**" Tecniche Nuove II edizione, Milano, Link editore ebook www.tecnichenuove.com; ISBN: 9788848124331