ЦЕНТЪР ЗА ОБУЧЕНИЕ – БАН

1000 София
ул. „Сердика“ № 4
http://edu.bas.bg

email: tdc-phd@cu.bas.bg
тел.: 02 987 31 67
02 979 52 60

Basic Information:
Course Information:
Course Title: IMMUNOFLUORESCENCE AND IMMUNOHISTOCHEMISTRY – BASIC PRINCIPLES AND APPLICATION IN CELL, MOLECULAR BIOLOGY AND CLINICAL DIAGNOSTICS
Lecturer: Assoc. Prof. Anelia Kostadinova, PhD
Phone: +359 897946452
Email: aneliakk@yahoo.com
Course Hours: 30 academic hours

Annotation (up to 150 words)
Immunofluorescence and Immunohistochemistry are two widely used techniques in cell and molecular biology for studying cell signaling mechanisms, as well as for diagnostics in medicine. Both techniques are based on the binding of antibodies to specific protein molecules in the cell (antigens). The antigen-antibody reaction occurs at the exact location of the targeted antigen, and through counterstaining via a chemical reaction or a fluorescent dye, it becomes visible under a microscope. These techniques play a major role in diagnosing tumors, as well as various degenerative and inflammatory diseases of the nervous and muscular systems. The main difference between the two methods lies in the specimens used. In immunohistochemistry, the analysis is performed on tissue sections that have undergone various preparation stages, while immunofluorescence uses cell suspensions or single layers of cells on microscope slides. The course is aimed at PhD students interested in cell and molecular biology, cell signaling, and mastering new, reliable methods for the fast, accurate confirmation and treatment of various diseases.

Course Content (Brief Description by Topics or Modules):

- **Topic / Module 1:** Selection of an appropriate primary antibody for immunofluorescence and immunohistochemical analysis
- **Topic / Module 2:** Antibody structure. Polyclonal and monoclonal antibodies and methods for their production.
- **Topic / Module 3:** Microscopic observation and interpretation of results from immunofluorescence and immunohistochemical analyses
- **Topic / Module 4:** Morphometric image analysis and its application in studying pathology in tissue sections

Teaching and assessment methods
Forms of Training and Assessment:

Lectures and exercises
Interview (exam) resulting in a "Pass" grade

1000 София
ул. „Сердика“ № 4
http://edu.bas.bg
email: tdc-phd@cu.bas.bg
тел.: 02 987 31 67
02 979 52 60

Competences Acquired as a Result of the Training:

1. Selecting antibodies according to the cell culture type and independently performing immunofluorescence on cell cultures.
2. Observing, describing, and recognizing structures stained via immunofluorescence.
3. Preparing immunohistological sections; staining and analyzing them.
4. Detecting cellular structures in both normal and pathological states.

References:

1. Greenfield, E. A. (2014). *Antibodies: A Laboratory Manual* (2nd ed.). Cold Spring Harbor Laboratory Press. (Fundamental guide for antibody handling).
2. Bancroft, J. D., & Layton, C. (2018). *Bancroft's Theory and Practice of Histological Techniques* (8th ed.). Elsevier. (Core source for immunohistochemical methods and tissue preparation).
3. Hewitt, S. M., Baden, T. J., & Lader, A. S. (Eds.). (2020). *Immunocytochemistry: Methods and Protocols*. Humana Press. (Methodology for immunofluorescence and cell suspension analysis).