

HSTO 240

Immunohistochemistry

2 Credits

Community College of Baltimore County
Common Course Outline

Description

HSTO 240 – Immunohistochemistry: is a course in which students explore methods that use antibodies to check certain antigens in a tissue sample. Immunohistochemistry is used in the pathology laboratory as an aid in the differential diagnosis and classification of cancer, and for certain other diseases, including infections. The student demonstrates the purpose, principles, reagents, controls, troubleshooting, and results of each immunohistochemical stain. Learning the theory and techniques employed in the histology laboratory prepares the students to successfully integrate greater skills to enter the field of histotechnology.

Pre-requisites: HSTO 155

Overall Course Objectives

Upon completion of this course, students will be able to:

1. identify the theories of the specialized technique, immunohistochemistry;
2. outline fixation and pre-analytical factors regarding immunohistochemistry including the desired fixation, microtomy thickness, tissue and slide processing, control material, validating of reagents, and any special tissue preparation;
3. describe antigens in relation to immunohistochemistry;
4. state factors that influence antigen retrieval;
5. outline the selection of choosing the primary antibody;
6. state the current and future challenges of determining primary antibodies;
7. identify the staining techniques for avidin-biotin complex (ABC) and peroxidase/anti-peroxidase (PAP);
8. explain the purpose of the catalyzed signal application;
9. demonstrate the steps for the horseradish peroxidase (HRP) method;
10. summarize the application of dyes for diagnosing a disease;
11. describe how immunofluorescence (IF) is used in immunohistochemistry;
12. outline the methods to obtain optimal results in immunohistochemistry staining;
13. outline the importance of antibody diluents and concentrations;
14. describe the advantages to automation in immunohistochemistry;
15. state the different types of tissue microarray;
16. outline the advantages and disadvantages in tissue microarray in immunohistochemistry;
17. describe the difference between fluorescence in situ hybridization (FISH) and chromogenic in situ hybridization (CISH); and
18. explain the sources of error in immunohistochemistry and appropriate corrective action.

Major Topics

The Common Course Outline (CCO) determines the essential nature of each course.
For more information, see your professor's syllabus.

- I. Introduction to immunochemistry
 - a. Techniques
 - b. History
- II. Fixation and other pre-analytical factors
 - a. Tissue handling
 - b. Fixation
 - c. Tissue and slide processing
 - d. Special tissue preparation
 - e. Control material
 - f. Validation
- III. Antigen retrieval
 - a. Factors influencing the effect of antigen retrieval
 - b. Standardization of antigen retrieval
 - c. Application of antigen retrieval
 - d. Antigen-immunochemistry based research
- IV. Selection of the primary antibody
 - a. Selecting the proper antibody
 - b. Examples of good/poor antibodies
 - c. Challenges
- V. Immunohistochemistry staining methods
 - a. Avidin-Biotin complex (ABC)
 - b. Peroxidase/anti-peroxidase (PAP)
 - c. Catalyzed signal application
 - d. Horseradish peroxidase (HRP)
 - e. Selection of dyes
 - f. Immunofluorescence
- VI. Optimization of immunohistochemistry reactions
 - a. Tissue digestion
 - b. Antibody diluents and concentrations
 - c. Incubation times, wash buffers and glass slide types
- VII. Automation in immunohistochemistry
 - a. Advantages
 - b. Staining techniques
 - c. Workflow
- VIII. Tissue microarray
 - a. Advantages
 - b. Disadvantages
 - c. Types
 - d. Analysis
- IX. Immunohistochemistry visualization of molecular tests
 - a. FISH
 - b. CISH
- X. Troubleshooting
 - a. Common problems
 - b. Corrective actions

Course Requirements

The Common Course Outline (CCO) determines the essential nature of each course.
For more information, see your professor's syllabus.

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- Weekly quizzes
- Weekly assignments
- Three exams
- A cumulative final exam

Other Course Information

This course is part of a program sequence, which requires admission to the program.
This course is offered in the spring semester only.

Date Revised: 10/19/2021