

Common Course Outline
HSTO 106
Special Staining I
2 Credits

Community College of Baltimore County

Description

HSTO 106 – Special Staining I explores the use of a variety of introductory special stains, dyes, and techniques to highlight individual tissue components once an Hematoxylin and Eosin (H&E) stain is evaluated. The student demonstrates the purpose, principles, reagents, controls, troubleshooting, and results of each special 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.

2 Credits

Prerequisite: HSTO 155

Overall Course Objectives

Upon completion of this course students will be able to:

1. identify the cognitive theories of staining carbohydrates, amyloid, connective tissue, muscle, lipids and specialized techniques such as immunohistochemistry;
2. describe the different stains in a classroom setting;
3. identify tissue structures and their staining characteristics;
4. explain the difference between carbohydrates and amyloid;
5. describe the different types of carbohydrates;
6. explain the difference between primary and secondary amyloid;
7. explain the best method for screening amyloid;
8. identify and explain the 3 connective tissue fibers;
9. summarize the various types of cells in connective tissue proper;
10. indicate the most widely used stain used for the demonstration of elastic fibers;
11. explain the silver techniques for reticular fibers;
12. identify and explain the 3 types of muscle fibers;
13. explain the techniques for staining muscles;
14. describe the tissue preparatory techniques for oil red O, osmium tetroxide and Sudan black B;
15. describe antibodies and antigens in reference to immunohistochemistry;
16. explain the difference between direct and indirect immunohistochemical techniques;
17. identify the different enzyme systems in enzyme immunohistochemistry;
18. describe immunofluorescence relating to immunohistochemistry techniques;

19. outline each stain in the above categories including the desired fixatives, microtomy thickness, primary reagents and dyes and their purposes, staining results, appropriate control and any special techniques; and
20. explain the sources of error in staining and appropriate corrective action.

Major Topics

- I. Carbohydrates
 - a. Periodic acid Schiff
 - b. PAS with diastase digestion
 - c. Best carmine
 - d. Alcian blue
 - e. Alcian blue with hyaluronidase
- II. Amyloid
 - a. Alkaline Congo red
 - b. Crystal violet
 - c. Thioflavin T
- III. Connective tissue
 - a. Masson trichrome
 - b. Van Gieson picric acid-acid fuchsin
 - c. Verhoeff elastic stain
 - d. Aldehyde fuchsin elastic stain
 - e. Movat pentachrome
 - f. Gomori stain for reticular fibers
 - g. Gordon & Sweets stain for reticular fibers
 - h. Toluidine blue
- IV. Muscle
 - a. Mallory phosphotungstic acid hematoxylin (PTAH)
- V. Lipids
 - a. Oil red O
 - b. Sudan black B
 - c. Osmium tetroxide paraffin procedure for fat
- VI. Immunohistochemistry
 - a. Basic PAP immunoperoxidase
 - b. ABC-immunoperoxidase
 - c. HRP enzyme-labeled polymer procedure

Course Requirements

Grading procedures will be determined by the individual faculty member but will include the following:

Grading/exams

- Weekly quizzes and assignments
- A minimum of three (3) exams
- A cumulative final examination

Written Assignments: Students are required to use appropriate academic resources.

Other Course Information

This course is a Histology program core course.

This course is part of a program sequence, which requires admission to the program.

This course is offered in the Spring only.

Date Revised: 12/05/2017