Common Course Outline
HSTO 103
Tissue Fixation and Processing
2 Credits

Community College of Baltimore County

Description

HSTO 103 – Tissue Fixation and Processing explains the functions, actions and factors that affect the quality and choice of a fixative. Topics include simple and compound fixatives, coagulant and non-coagulant fixatives, and aqueous and non-aqueous fixatives, along with various procedures of histology requiring fixation. Students identify fixation pigments, artifacts and troubleshooting methods. The course examines tissue processors with regards to reagents used, maintenance and troubleshooting, as well as tissue processing and special techniques in processing of decalcification and frozen sectioning.

2 Credits

Prerequisites: HSTO 101 and HSTO 102

Overall Course Objectives

Upon completion of this course students will be able to:

1. define a fixative related to histology;
2. explain the functions of fixatives for a bacterial or enzyme attack, the stabilization of the tissue, and staining;
3. differentiate the actions of fixatives relating to enzymes and stabilizing proteins;
4. describe fixation factors including temperature, size of the specimen, volume ratio of the specimen vs. the amount of the fixative, and time of fixation;
5. describe the reactions of portions of the cell, such as the nucleus, proteins, lipids and carbohydrates, with fixatives;
6. list the properties, functions, and actions of simple fixatives;
7. compare and contrast compound (combined) fixatives in relation to counterbalancing each fixative;
8. explain the difference between coagulant and non-coagulant actions of fixatives;
9. compare and contrast aqueous and non-aqueous fixatives;
10. describe the various histology procedures requiring fixation such as light and electron microscopy, special stains, frozen sections, enzyme histochemistry, immunohistochemistry, cytologic specimens, and in-situ hybridization;
11. state the formation, prevention and removal of pigments and artifacts;
12. describe troubleshooting problems, including autolysis and incomplete fixation;
13. outline the purpose of a tissue processor, maintenance and troubleshooting;
14. outline the dehydration steps in processing tissue, including dehydrating agents;
15. compare and contrast each universal solvent and clearing agent;

16. explain the purpose of the clearing step in processing;
17. explain the purpose of infiltration and compare infiltration media;
18. describe the various histology procedures requiring processing such as light microscopy, frozen sections, enzyme histochemistry, calcified tissue, immunohistochemistry, cytologic specimens, and in-situ hybridization;
19. identify potential processing problems with overprocessing, underprocessing of tissue and frozen sectioning; and
20. describe the decalcification process by acid methods, determining the end point, and troubleshooting.

Major Topics

I. Function and action of fixatives
II. Fixation factors
III. Reactions of the cell
IV. Simple fixatives
V. Compound fixatives
VI. Coagulant and non-coagulant action
VII. Aqueous and non-aqueous actions
VIII. Histology procedures requiring fixation
IX. Pigments and artifacts
X. Troubleshooting fixation problems
XI. Tissue processor
XII. Dehydration
XIII. Clearing
XIV. Infiltration
XV. Procedures requiring processing
XVI. Infiltration media
XVII. Troubleshooting processing problems
XVIII. Decalcification
XIX. Frozen sectioning

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 Fall only.

Date Revised: 12/05/2017