Miami Dade College

Course Description

MLS4181C | Immunohistochemistry | 3.00 credits

This course introduces the various techniques that are used in the preparation and evaluation of immunohistochemistry slides. Procedures and terminology related to immunohistochemistry are also discussed and strategies for troubleshooting problems are presented.

Course Competencies:

Competency 1: The student will demonstrate and apply the principles and theories of immunohistochemistry by:

1. Explaining the role of immunohistochemistry (IHC) in the Histology Laboratory
2. Discussing safety issues related to immunohistochemistry
3. Defining the following terms:
    a. Antigen
    b. Antibody
    c. Substrate
    d. Chromogen
    e. Fluorochrome
    f. Epitope
    g. Secondary antibody
    h. Multilink secondary antiserum
4. Illustrating the principles of immunohistochemistry as they relate to the following terms:
    a. Direct
    b. Indirect
    c. Peroxidase-anti-peroxidase
    d. Avidin-biotin complex
    e. Polymeric detection system
5. Listing at least two common fluorochromes
6. Identifying two common chromogens in immune peroxidase and alkaline phosphatase techniques.
7. Listing two methods of epitope retrieval
8. Listing three solutions that are used for heat-induced epitope retrieval

Competency 2: The student will demonstrate knowledge of appropriate quality control and validation while performing immunohistochemistry procedures by:

1. Explaining the general principles of quality control in immunohistochemistry
2. Discussing the use of positive and negative tissue and reagent controls
3. Debating why preparing positive controls in the laboratory is preferred to purchasing them
4. Appraising recommended quality for an antibody and a tissue block
5. Assessing the requirements for daily quality control of immunohistochemistry
6. Discussing the storage of quality control slides

Competency 3: The student will demonstrate knowledge, comprehension, and application of specimen and slide preparation procedures for immunohistochemistry by:

1. Deciding the preferred method of specimen preparation for immunohistochemistry
2. Adapting a sound theoretical approach to the application of immunohistochemistry within the work environment
3. Carrying out immunohistochemistry protocols to demonstrate how proteins are distributed within a tissue section
4. Interpreting and identifying positive staining within a tissue section using a light microscope
5. Troubleshooting the interaction of an antigen and antibody and their impact on the immunohistochemistry reactions
6. Preparing reagents and antibodies, including calculation of molarity and dilutions

Competency 4: The student will demonstrate knowledge, comprehension, and application of epitope unmasking and retrieval that may be used in performing immunohistochemistry procedures by:

1. Performing epitope unmasking and retrieval on a given specimen
2. Preparing the proper epitope retrieval solutions
3. Troubleshooting epitope retrieval methods

Competency 5: The student will demonstrate knowledge, comprehension, and application of troubleshooting procedures when performing immunohistochemistry staining by:

1. Troubleshooting Immunohistochemical procedures due to fixation errors
2. Troubleshooting specimen size and processing and pretreatment
3. Evaluating and performing quality control requirements of Immunohistochemical specimens

Learning Outcomes:

- Communicate effectively using listening, speaking, reading, and writing skills
- Solve problems using critical and creative thinking and scientific reasoning
- Formulate strategies to locate, evaluate, and apply information
- Demonstrate knowledge of ethical thinking and its application to issues in society
- Use computer and emerging technologies effectively
- Demonstrate an appreciation for aesthetics and creative activities