دانشگاه علوم پزشکی تهران
معاونت پژوهشی

Histology internship

20 hours
Outline:

During this internship, we will have hands-on experience with the Formalin-Fixed Paraffin Embedded (FFPE) technique, a standard procedure used in clinical and research laboratories. This technique involves several stations, including Fixation, Processing, Blocking, Sectioning, Staining, and Coverslipping. We will learn how to handle tissue specimens, prepare solutions, and use various equipment.

1- Fixation

In this stage, we will learn about the fixation of various tissues, including the optimal duration for fixation, the appropriate fixatives, and other related topics. After formalin fixation, the tissue undergoes processing to replace the water with paraffin wax. Once this stage is complete, we will proceed to the next one.

2- Processing

We process fixed tissue samples using a manual method. This process prepares tissue samples for embedding in paraffin wax by taking the tissue through three steps: dehydration in alcohol, clearing in xylene, and infiltration with paraffin wax.

3- Blocking

The primary objective of this stage is to provide support for the tissue during sectioning, allowing for precise cutting and preservation of the morphology of cells and tissue. We place the specimen in a mold in the correct position to determine the cutting plane of the tissue in the microtome. Then, we fill the mold with molten wax using a Paraffin dispenser, which solidifies around the specimen and allows it to be securely clamped in the microtome.

4- Sectioning

Most histological sections are 2D slices, from a 3D piece of tissue. Exactly what will be seen on the microscope slide depends on the plane of the section; that is, the position of the microtome cut, in relation to the anatomical structures in the tissue. We use albumin, tissue bath and slides as well to collect some thin tissue slices for the staining stage.

5- Staining

Histological staining is used to highlight important features of the tissue as well as to differentiate structural elements of the tissue by their color and/or staining intensity. So, after deparaffinization we hydrate the tissue again and stain them with Hematoxylin and Eosin and other available stains.

6- Coverslipping

The final step in preparing a microscope slide for observation under a light microscope is to apply a coverslip, sometimes referred to as a coverglass. Coverslips are applied to stained tissue sections to both preserve the stained sections and to prevent damage to the tissue section.

We're excited to have you with us here at TPCF. We hope your time here will be both educational and enjoyable, and we're dedicated to providing you with the best possible learning experience. We look forward to working with you!