**MLS 534**

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1. Immunohistochemistry (IHC) involves the process of selectively identifying antigens (proteins) in cells of a tissue section by exploiting the principle of antibodies binding specifically to antigens in biological tissues. Detection at the light microscopic level of antigen–antibody interactions can be achieved by labelling the antibody with a substance that can be visualized, either by conjugation to a fluorescent marker or enzyme followed by colorimetric detection. IHC staining is widely used in the diagnosis of abnormal cells such as those found in cancerous tumours. Specific molecular markers are characteristic of particular cellular events such as proliferation or cell death (apoptosis). IHC is also widely used in basic research to understand the distribution and localization of biomarkers and differentially expressed proteins in different parts of a biological tissue.

The IHC reactions can be applied in different situations within research or histopathology laboratories.

1. Histogenetic diagnosis of morphologically non-differentiated neoplasias
2. subtyping of neoplasias such as lymphomas
3. characterization of primary site of malignant neoplasias
4. research for prognostic factors and therapeutic indications of some diseases
5. discrimination of benign versus the malign nature of certain cell proliferations

As IHC, can detect the earliest changes in transformed tissues and identifying cellular changes not normally visible with H&E, it can be used to help distinguish hyperplasia from neoplasia. . IHC may act as a Prognostic markers in cancer, prediction of response to therapy and to detect infectious agent in tissues by use of specific antibodies against microbial DNA or RNA, e.g. in Cytomegalo virus, Hepatitis B virus, Hepatitis C virus. In brain trauma, immunohistochemical staining for beta amyloid precursor protein has been used as a method to detect axonal injury within as little as 2–3 h of head injury. This is useful in establishing timing of a traumatic insult in medico-legal settings. In muscle diseases IHC can assist in differentiating vascular dystrophy from non-dystrophicdisorders.

Although the routine histological and cytological techniques are valuable tools in diagnosis, the success of these screening methods are limited with respect to sensitivity and specificity. Interpretation of histology and cytology screening rely on subjective, morphological evaluation and are also affected by high rates of discordance amongst the scientists interpreting results. IHC used in conjunction with these routine tools makes up for their limitation serving as an objective tool allowing unambiguous identification of cells (either normal, malignant or benign).

1. Plastination is a technique for the preservation of animal and human tissue by which body fluids and fat are replaced with synthetic materials such as silicone resins or epoxy polymers.

Embalming refers to the preservation of animal and human remains via inhibiting decomposition with the use of chemicals for the purpose of medical education or social reasons (e.g., funeral service). Embalming involves the preservation of the entire human body.

Preservation of most biological tissues is performed using liquids such as formaldehyde, alcohol, and glycerin. Although these commonly used liquids are efficient, they have many disadvantages such as their carcinogenicity. The process of embalming can cause some distress to the specimen which can make it lose its structure.

Plastination techniques are non-hazardous, non-infectious, and do not radiate fumes or fluids.

Unlike embalmed specimen, plastinated specimen can be stored in simple plastic bags, along with suitable credentials. Plastinated specimens require little storage and no maintenance.