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COMMENTARY

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A Brief Note on Histopathology

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Description

Histopathology is the study of disease symptoms through microscopic analysis of tissue. Histopathology refers to a pathologist's evaluation of a biopsy or surgical specimen after it has been processed and histological sections have been mounted on glass slides in clinical medicine. Cytopathology, on the other hand, studies free cells or tissue micro-fragments. Surgery, biopsy, or autopsy is used to begin the histopathological investigation of tissues [1,2]. The tissue is removed from the body or plant, and then placed in a fixative, which stabilizes the tissues and prevents decomposition, frequently after professional dissection in the fresh form. Formalin is the most frequent fixative.

Histological sample preparation

Chemical fixation: Other chemical fixatives have been used in addition to formalin. Formalin has since become the standard chemical fixative in human diagnostic histopathology, thanks to the introduction of immunohistochemistry staining and diagnostic molecular pathology testing on these specimen samples. Fixation times for very small specimens are shorter, and human diagnostic histopathology has standards [3-5].

Processing: Increasing amounts of alcohol are used to eliminate water from the sample in subsequent phases. The last dehydration step is performed with xylene rather than alcohol because the wax employed in the next stage is soluble in xylene but not in alcohol, allowing wax to permeate the specimen. In most cases, this procedure is mechanized and completed overnight. After that, the wax-infiltrated specimen is transferred to a separate specimen embedding container. Finally, molten wax is poured around the specimen in the container and allowed to cool to solidify before being embedded in the wax block [6]. This procedure is required in order to acquire a suitably orientated sample that is stable enough to obtain thin microtome sections for the slide. When the wax embedded block is ready, parts are cut out and placed on a water bath surface to spread out. This is often done by hand and requires talent, with lab employees deciding which pieces of the specimen microtome wax ribbon to place on slides [7,8]. Throughout the block, a number of slides from various levels will normally be prepared. The thin section mounted slide is then stained and covered with a protective cover slip. A mechanized procedure is usually utilized for common stains, while infrequently used stains are often done by hand.

Frozen section processing: Frozen section processing is the second way of histological processing. A skilled histoscientist performs this extremely technical scientific approach. The tissue is frozen and thinly sliced using a microtome installed in a cryostat, which is below-freezing refrigeration equipment. The thin frozen sections are put on a glass slide, treated momentarily in liquid fixative, and stained using staining techniques identical to those used on typical wax embedded sections.

References

[1] Veta M, Heng Y, Stathonikos N, Bejnordi B, Beca F, Wollmann T, et al. Predicting breast tumor proliferation from whole-slide images: the TUPAC16 challenge. Med Image Anal 2019;54:111-121.

[2] Jang SJ, Gardner JM, Ro JY. Diagnostic approach and prognostic factors of cancers. Adv Anat Pathol 2011;18:165-172.

[3] Esteva A, Kuprel B, Novoa RA, Ko J, Swetter SM, Blau HM, et al. Dermatologist-level classification of skin cancer with deep neural networks. Nature 2017; 542:115-118.

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[4] De Fauw J, Ledsam JR, Romera-Paredes B, Nikolov S, Tomasev N, Blackwell S, et al. Clinically applicable deep learning for diagnosis and referral in retinal disease. Nat Med 2018; 24:1342-1350.

[5] Basser PJ, Pierpaoli C. Microstructural and physiological features of tissues elucidated by quantitative-diffusion-tensor MRI. J Magn Reson B 1996;111:209-219.

[6] Beets-Tan RGH, Beets GL. Rectal cancer: review with emphasis on MR imaging. Radiology 2004;232:335–346.

[7] Liney GP, Moerland MA. Magnetic resonance imaging acquisition techniques for radiotherapy planning. Semin Radiat Oncol 2014;24:160–168.

[8] Intven M, Reerink O, Philippens M. Diffusion-weighted MRI in locally advanced rectal cancer. Strahlenther Onkol 2013;189:117-122.