

Vetpath is a specialist veterinary laboratory dedicated to providing our clients with the finest laboratory diagnostic service. A team of veterinary pathologists and medical scientists with extensive experience in veterinary diagnostic pathology forms the core of the Vetpath team.

VN News

NOVEMBER 2010

IMMUNO- HISTOCHEMISTRY AND HISTOPATHOLOGY

Histopathology is a key tool for the diagnosis of neoplasia and has the benefit of being able to identify cells and tissues and examine the interactions between cells and their environment. The techniques are reliable and frequently repeatable and provide a large amount of prognostic and diagnostic data in most cases of neoplasia. However, there are some cases of neoplasia where the cells don't retain any recognizable morphology and may not be located in a predicted location; as encountered in many metastatic lesions. In these instances it is very helpful to have additional tools available to aid and assist in the diagnostic process.

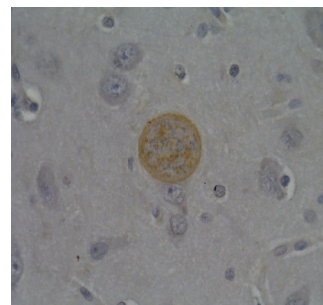
Historically pathologists devised a variety of histochemical stains to highlight cell products and specific cell components to help identify specific cells and tissues. In this way the toluidine blue stain is used to accentuate the metachromatic

cytoplasmic granules of mast cells and the Masson-Fontana stain highlights the melanin granules in melanocytes. At Vetpath histochemical stains are provided free of charge with routine histopathology cases. While these stains are very helpful, they are far from infallible. For example some melanomas are poorly and even non-pigmented making cell identification very tricky.

Newer staining methods have enhanced diagnostic success. Immunohistochemical staining utilizes the exquisite specificity of antigen-antibody binding to locate the stain at specifically targeted antigens. Antibodies are designed and manufactured to bind specifically to a targeted antigen known to be specific for a particular cell, cell product, or other characteristic features. These antibodies are labeled with stain-precipitating enzymes, often in complex polymer reactions. The end result is a specific stain deposited in the sections at the site of the target antigen.

In this way we can visualize the target cells in their tissue context and refine the diagnosis – often very specifically. Some stains have been developed to demonstrate viral antigens in cells and are very helpful

in the diagnosis of infectious diseases. Cell markers have been developed that identify broad tissues while others are used to identify very specific cell types and cellular components.

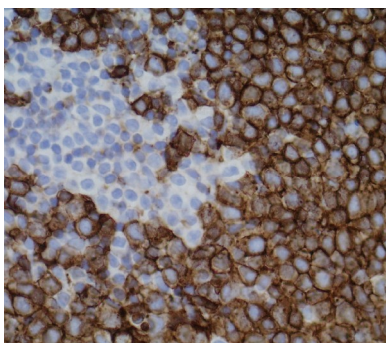


Neospora caninum cyst staining positive in the brain of a dog

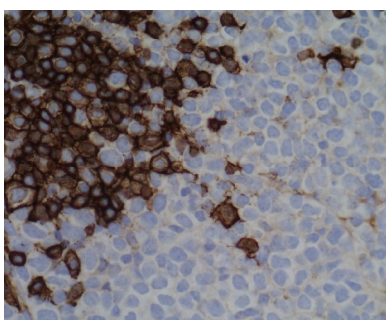
For example pancytokeratins identify most epithelial and related cells. Vimentin is more specific for mesenchymal cells. Using these stains we can differentiate between a poorly differentiated tumour of epithelial or stromal origin.

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The most commonly used immunostains at Vetpath are the markers to differentiate between T-cells and B-cells in cases of lymphoma. Now cases can be grouped and diagnosed more accurately and thereby helping the choice of therapeutic intervention.



CD3 stained lymphoid tissue highlighting the T-cell population in brown.



CD20 stained section revealing brown stained positive B-cells in a duplicate section of the previous sample.

The use of immunohistochemistry for determining the prognosis in cases of neoplasia is an emerging field. Currently we utilize the detection of mitotic figures as a crude measure of the proliferation of a cell population. However this targets only a small proportion of cells in the cycle of cell division and can include dysfunctional cells in mitotic arrest (and thereby falsely raising the mitotic rate).

Determining the rate of cell division is in many cases of cancer a very reliable prognostic tool and possibly also a guide to the therapeutic possibilities. Increasingly there are scientific papers being published showing the value of these markers for specific tumour types. Currently the most repeatable results appear to be with the cell cycle marker Ki-67. Counting the number of positively staining cells in a specific area (high power field/square millimeter) can be statistically linked to clinical outcome. While this work is still in development for some tumours, currently this technique is gaining acceptance.

At Vetpath we run many immunohistochemical stains and these are tailored to each case. In the case of lymphoma we run a standard panel of stains to aid diagnosis. In other instances we will choose a panel of stains that could help differentiate suspected neoplasms. The cost is determined on a case by case basis. Because we are trying to encourage the use of these stains, we have kept the costs to the bare minimum. In the histopath report we will try and outline the stains that could be helpful, but in all cases it is essential to talk to the pathologist when ordering immunohistochemistry for a non-lymphoma case

In the future we are going to work with Ki-67 to see how well this technique works in our hands and whether clinicians feel the extra cost and delay in getting final results is worth it.

Immunohistochemistry is no longer a new technology and is a standard and widely accepted diagnostic tool. As newer applications of the technique emerge we will continue to bring these to your attention.

URGENT SAMPLES

The new Vetpath Submission forms have a box that can be checked for urgent cases. As a rule our laboratory handles all cases as expeditiously as possible with the aim of a 4 hour turnaround for all haematology and biochemistry samples. However in very urgent cases we will ensure these cases get to the front of the queue and are handled with significant priority. This can result in other samples being slightly delayed.

It has become apparent that increasingly some clinics submit all their cases with the urgent box checked. Obviously this might be the case for an emergency centre but is unlikely to be the case in routine submissions.

Vetpath staff would appreciate it if this service is used only for urgent cases and that you select to check the urgent box only when the case needs to be handled with extreme urgency. Your cooperation in this would be greatly appreciated.



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