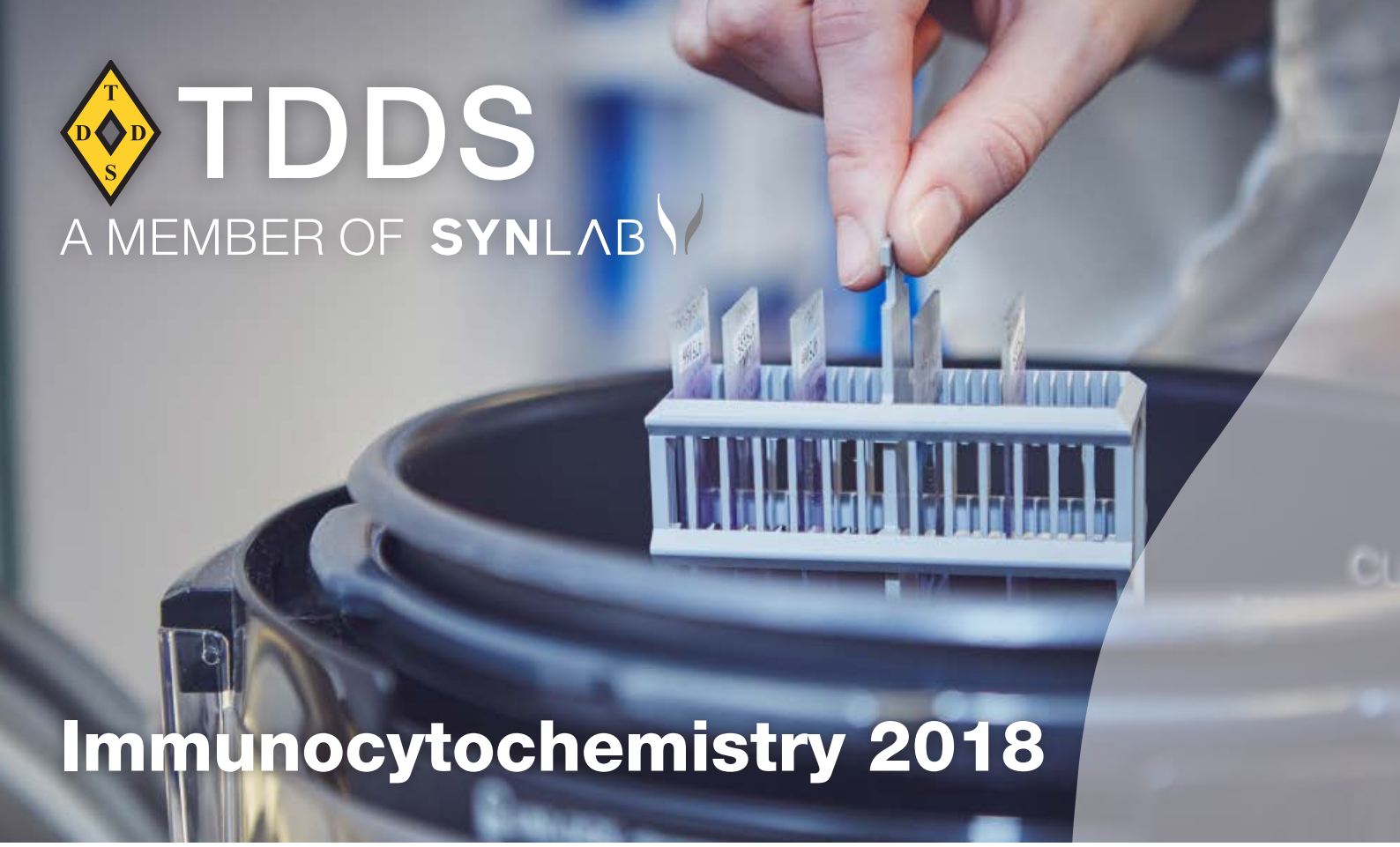

TDDS

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Immunocytochemistry 2018

Breakthrough in Immunocytochemistry

At TDDS we constantly strive for diagnostic innovation which is immediately applicable and relevant in veterinary practice. We are proud to announce that following a successful extended project in 2016 by one of our pathologists, Julie Vickers, we can now offer additional immunocytochemistry staining on the slides you submit for cytological interpretation. We are one of only a few commercial Veterinary Laboratories in the world able to offer this service on previously stained slides.

The implications of this innovation for Veterinary Surgeons in practice are:

- The improvement in diagnostic accuracy made possible with immunohistochemistry can now be applied to cytology slides.
- Slides submitted for cytology can be interpreted by a cytologist under routine cytology stains and the same slides can be used for immunostaining without any requirement for further sampling.
- This maximises diagnostic accuracy with minimal invasion of the patient.
- Currently we have optimised immunostains for differentiating B- and T-cell lymphomas (see box).
- The technique is widely applicable and we have had promising results with markers for epithelial (cytokeratin), mesenchymal (vimentin), plasma cell (MUM-1) and melanocytic (Melan-A) origin. These markers further identify tumour type and will be optimised shortly.
- The long term goal is to be able to identify more specifically a wide range of poorly differentiated tumours to aid with treatment planning, and potentially prognostic markers.
- With the project moving forward rapidly we advise you to discuss possible applications of immunostaining in individual cases with our pathologists.

Bridge Pathology

VPG Veterinary Pathology Group

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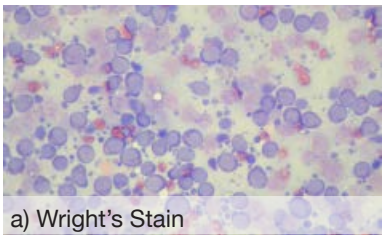
In a case series of 50 lymphomas and lymphoid leukaemias (43 dogs / 7cats) submitted for cytological examination and stained with a methanolic Romanowsky stain the immunocytochemistry protocol was able to identify cell phenotype in 49 cases (42/43 dogs, 7/7 cats).

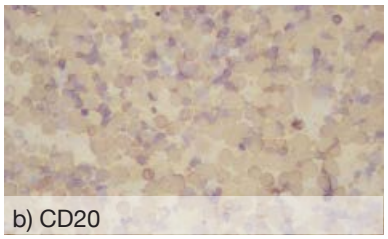
Phenotyping by immunocytochemistry had 100% agreement with results determined by immunohistochemistry or flow cytometry in 10 out of 10 cases (8/8 dogs, 2/2 cats).

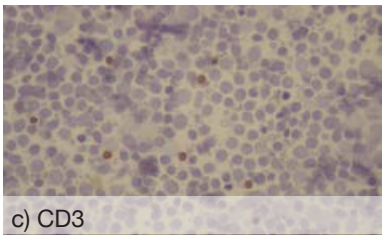
Immunocytochemistry determined phenotype had 91% agreement (41 out of 45 cases) with PARR determined genotype.

Example 1: Lymphoma phenotyping

FNA of a canine lymph node stained with Wright's stain (a). Cytology consistent with lymphoma.
The majority of the large lymphocytes are CD20+ (b) indicating B-cell origin with a few background reactive small lymphocytes CD3+ (c). In context with the cytology, the immunocytochemistry results indicate a B-cell lymphoma.

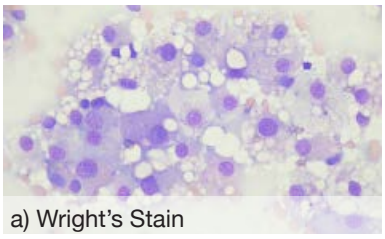

a) Wright's Stain

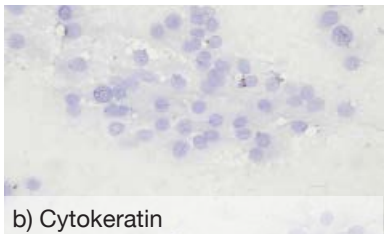

b) CD20

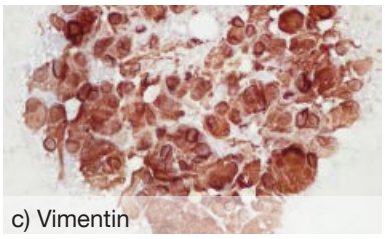

c) CD3

Example 2: Identifying tumour type

FNA of a cutaneous mass stained with Wright's stain (a). Cytomorphologically this could represent a liposarcoma or a sebaceous carcinoma. These tumours are likely to behave differently - liposarcomas tend to be locally invasive whilst lymphatic metastasis is more likely with a sebaceous carcinoma. The cells are negative for cytokeratin (b) (epithelial marker) and positive for vimentin (c) (mesenchymal marker) indicating mesenchymal origin. In context with the cytology findings, a liposarcoma is most likely.


a) Wright's Stain


b) Cytokeratin


c) Vimentin

Julie Vickers
BVSc, Dip ACVP (Clin Path), FCRPath, MRCVS

Originally from Bolton, Julie headed to the Southwest after graduating from Liverpool University Veterinary School in 1993. After 8 years in mixed practice at Westmoor Veterinary Centre in Tavistock, she switched to small animal practice working ultimately for the PDSA in Plymouth.

After completing a ESVPS General Practitioner Certificate in Small Animal Medicine in 2009 and a brief return to private practice at Charter Veterinary Hospital Group in North Devon she joined TDDS in 2010 as a Resident in Clinical Pathology. This led in 2014 to becoming both a Diplomate of the American College of Veterinary Pathologists and a Fellow of the Royal College of Pathologists.