Diagnostic Update

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Fall, Winter & Spring Hours: Monday to Friday - 8:00 am to 5:00 pm
Summer Hours (July 3-August 31, 2018): Monday to Friday - 8:00 am to 4:30 pm
Saturday - Bacteriology 9:00 am to 12:00 pm & Clinical Pathology 8:00 am to 4:00 pm

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In this Issue:

The Dangers of Trusting Automated White Blood Cell Differentials

By Cornelia Gilroy and Shelley Burton, Veterinary Clinical Pathologists

Modern hematology analyzers used for performing a complete blood count (CBC) for a veterinary patient are vital instruments in many practices. During a busy day, it may be tempting to rely solely on the automated leukon differentials these machines provide without microscopically examining blood smears. However, this practice is strongly advised against; it can result in serious errors as demonstrated by the following case.

A 7 year old male castrated Labrador retriever dog presented to the Atlantic Veterinary College Veterinary Teaching Hospital with the history of vomiting, diarrhea, lethargy and anorexia for 2 weeks. An initial CBC was performed on an in-clinic hematology analyzer (Table 1). Based on the automated analyzer results, there was a marked leukocytosis with a marked neutrophilia and marked lymphocytosis, best interpreted as chronic inflammation and antigenic stimulation.

Table 1: White blood cell CBC results

Analyte	Flag	Automated Results	Flag	Reported Results *	Reference Interval	Units
WBC	**H**	**60.7**	**H**	**60.7**	5.4 - 14.3	x 10^9/L
Seg neutrophils	**H**	**44.0**	**H**	**11.5**	2.8 - 10.1	x 10^9/L
Band neutrophils		0		0	0.0 - 0.3	x 10^9/L
Eosinophils		0.1		0	0.0 - 1.5	x 10^9/L
Basophils		0.03		0	0.0 - 0.1	x 10^9/L
Lymphocytes	**H**	**16.2**		1.2	0.9 - 4.6	x 10^9/L
Monocytes		0.4	**H**	**2.4**	0.1 - 1.4	x 10^9/L
Atypical			**H**	**45.6**	0.0 - 0.0	x 10^9/L
Toxic change				none		

*After blood smear evaluation and manual WBC differential cell count

A manual differential was then done on a blood smear and reported. The reported results were dramatically different as the leukon differential now had a mild neutrophilia, mild monocytosis and a marked increase in atypical cells. Of most interest and clinical significance were the presence of the atypical cells (Figure 1), as this finding confirmed a severe acute leukemia. Although suspected to be of lymphoid origin, determining the lineage of these neoplastic cells would have required further testing such as flow cytometry or immunocytochemistry. The neutrophilia and monocytosis

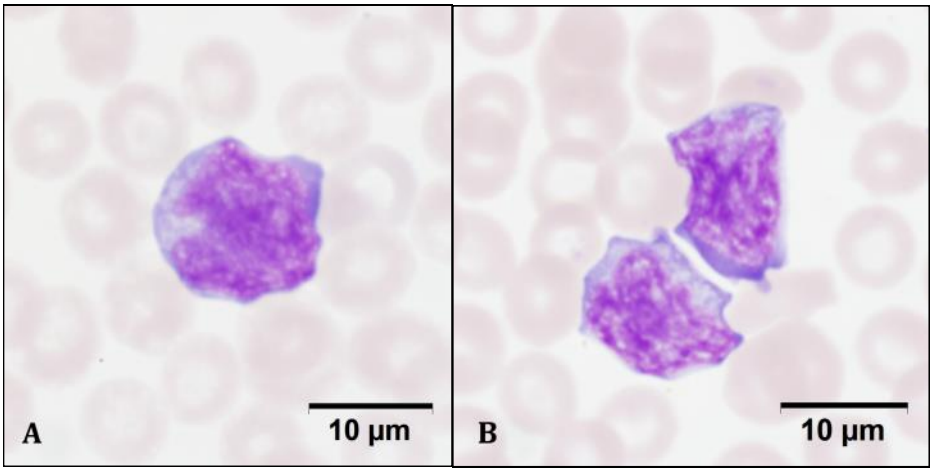


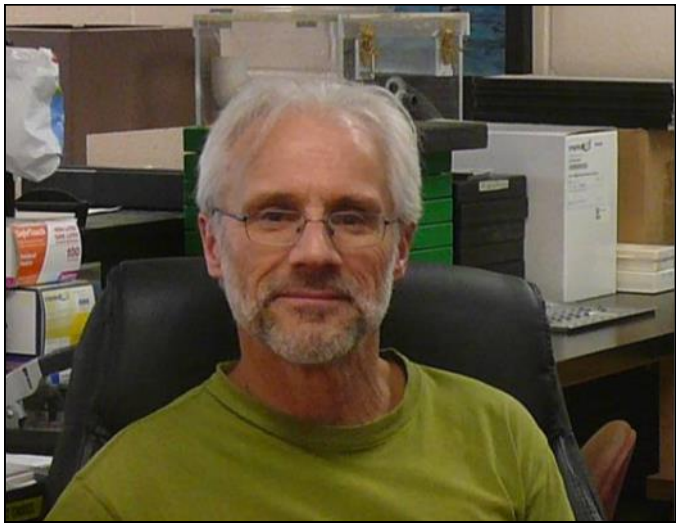
Figure 1 (A & B): Atypical cells with cleaved to indented nuclei from a dog with an acute leukemia

were non-specific and could have been due to mild inflammation, stress or excitement. Unfortunately, due to a poor prognosis and poor response to chemotherapy, the patient was humanely euthanized.

The automated analyzer had likely misclassified many of the leukemic cells as neutrophils due to the indented and cleaved nuclear shape, while leukemic cells with round nuclei were likely misclassified as routine lymphocytes. This case is a great example demonstrating the importance of not relying on automated leukon differential cell counts, but rather ensuring that blood smears are always evaluated as part of a full CBC. This will help us make the most accurate diagnosis possible for our patients!

Dr. Pierre-Yves Daoust Retires

By Shelley Burton, Veterinary Clinical Pathologist



After 30 years of serving students and wildlife at the Atlantic Veterinary College (AVC) as an anatomic pathologist and Professor, Dr. Pierre-Yves Daoust retired in December 2017. Originally from Québec, he received his veterinary degree in 1974 from the Université de Montréal. Following a pathology internship at his alma mater, Dr. Daoust obtained his PhD at the University of Saskatchewan in 1981. Before starting at the AVC in 1987, he worked as a research assistant at the Ontario Veterinary College and a diagnostic pathologist in Alberta, becoming board certified as Diplomate of the American College of Veterinary Pathologists in 1985.

Dr. Daoust has had a busy and successful academic career, publishing over 60 refereed scientific articles, teaching many veterinary courses and supervising graduate students. He has been coordinator of the Atlantic regional centre of the Canadian Wildlife Health Cooperative (CWHC) since it began in 1992. This organization facilitates critical wildlife disease surveillance, primarily by performing necropsies. Work with the CWHC has required development of a close relationship with government and other agencies. Under Dr. Daoust's conscientious management, the centre has prospered, with increased staff and new information about wildlife diseases obtained. These include identification of bat rabies in a PEI fox in 1993, identification of protozoal trichomoniasis in Maritime songbirds and the recent incursion into our region of white-nose syndrome, a devastating disease of bats.

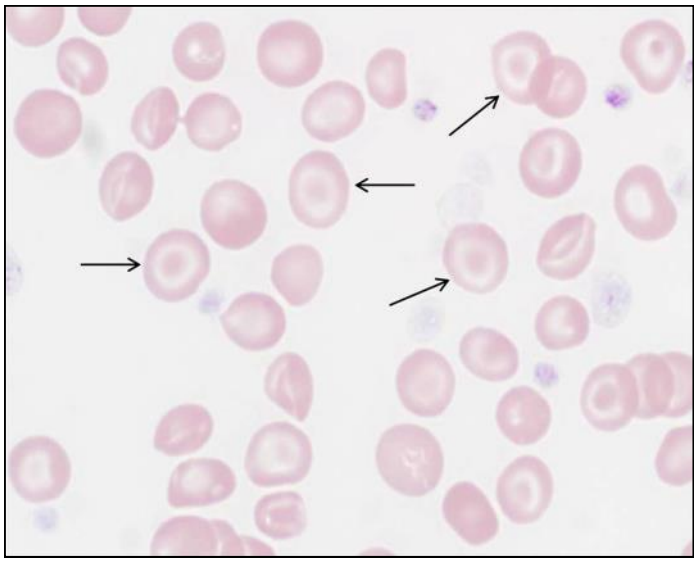
Because of his extensive scientific knowledge, passion for wildlife and respect for local communities and indigenous cultures, Dr. Daoust has explored and improved the welfare of animals impacted by human activities, including stranding, trapping and harvesting. He observed the seal hunt for many years, has served on related international committees and has improved the welfare of hunted seals. It is no exaggeration to say that he is the Canadian veterinarian who is most experienced and knowledgeable on the welfare issues of this activity. Dr. Daoust has also been involved in many other activities involving wildlife diseases and welfare. While too numerous to list, a recent high profile activity was his significant contribution to the incident report of mortality of North Atlantic right whales in the Gulf of St. Lawrence.

When not working, Dr. Daoust enjoys time spent at his country home with his wife, Ann Wheatley. They enjoy travelling, watching movies and taking pride in their adult children, Michel, Dominique and Gabrielle. Buddy, a Labrador retriever, Penelope, a Dachshund, and two cats, Lilly and Ulysse, complete the family. Those who have worked closely with Dr. Daoust can

attest to his boundless energy, love of pathology and physical toughness. The latter traits were best illustrated by his initial reluctance to get stitches after a severe hand cut during a whale necropsy because he did not want to miss any findings! His kind support of students will be missed as will his personal integrity and his humble and egalitarian nature. Although Dr. Daoust is officially retired from his university career, we will still have the pleasure of interacting with him. He is as busy as ever with ongoing projects, including activities in the Canadian north.

All the best, Dr. Daoust!

What is Your Diagnosis?



What erythrocyte morphology is indicated by the arrows? What is the significance or what conditions are these types of erythrocytes associated with? See page 4 for the answer.

FedEx courier service now available for shipping specimens to Diagnostic Services Laboratory. See Laboratory News below for details.

Laboratory News

By Cornelia Gilroy, Veterinary Clinical Pathologist

Here are some recent happenings in the Diagnostic Services Laboratory:

- Congratulations to Dr. Laura Bourque on passing the American College of Veterinary Pathologists certifying examination in anatomic pathology!
- We bid farewell to Ms. Pam Maloney upon her retirement from Diagnostic Services where she had been most recently working in the virology laboratory.
- Diagnostic Services is extending its courier offering to include service from FedEx. The cost for the FedEx courier service for most clients in Atlantic Canada will be $10 to ship up to ten pounds to the Atlantic Veterinary College. A $20 remote location charge will apply to remote locations.
- Dr. Dante Mateo, Dr. Carmencita Yason, Ms. Liz Dobbin and Mr. Matthew Saab attended the American Association of Veterinary Laboratory Diagnosticians 60th Annual Meeting in San Diego, California, from October 12-18th, 2017.
- Dr. Shelley Burton recently provided a presentation to the clinical pathology group and residents at Texas A & M College of Veterinary Medicine.
- Dr. Kim Foote, resident in clinical pathology, presented a poster on zinc toxicosis in 2 dogs at the American College of Veterinary Pathologists/American Society for Veterinary Clinical Pathology (ACVP/ASVCP) Annual Meeting in Vancouver from November 4-8th, 2017.
- Congratulations to Dr. Nicole Kaiser, second year anatomic pathology resident, on receiving a 2017 Charles Louis Davis and Samuel Wesley Thompson DVM Foundation Award at the American College of Veterinary Pathologists/American Society for Veterinary Clinical Pathology (ACVP/ASVCP) annual meeting held November 4-8th in Vancouver. This is a trainee award for excellence in diagnostic pathology.
- Dr. Pierre-Yves Daoust, wildlife anatomic pathologist, retired at the end of December 2017 after 30 years of service (please see full article on page 2).

Staff Focus

Dr. Noel Clancey

By Cornelia Gilroy, Veterinary Clinical Pathologist

We are fortunate to welcome back Dr. Noel Clancey to the Atlantic Veterinary College (AVC) as an Assistant Professor in Clinical Pathology with the Department of Pathology and Microbiology as of July 1, 2017.

Dr. Clancey is originally from near Dartmouth, Nova Scotia. Following his graduation from the AVC in 1999, he worked for a short time as a small animal practitioner in Dartmouth before moving to Vancouver, British Columbia (BC). After working in a busy small animal referral practice there for six years, Dr. Clancey returned to the AVC to pursue a combined residency in clinical pathology and Master of Veterinary Science degree, becoming board certified in clinical pathology by the American College of Veterinary Pathologists in 2010. Subsequently, Dr. Clancey was employed as a contract clinical pathologist at the AVC until 2013, devoting much of his time to diagnostic clinical pathology service, teaching of senior veterinary students and promotion of Diagnostic Services to our clients. In 2013, Dr. Clancey headed overseas to the United Kingdom where he was employed by Batt Laboratories (now part of the Laboklin family) as a principle clinical pathologist and co-manager.

Dr. Clancey's current responsibilities at the AVC are varied and include diagnostic clinical pathology service, in which he has a special interest in cytology, as well as teaching 2nd and 4th year veterinary students and our clinical pathology resident. In addition to cytology, Dr. Clancey is interested in hematology, infectious disease and lymphoproliferative disorders.

Dr. Clancey has many interests apart from work, including a passion for photography and travel. Some favorite photography vacation destinations include Kenya, Ireland's west coast, Scotland and Italy, with his next adventure planned for viewing grizzly bears in northern BC. Other activities that Noel enjoys include playing the guitar, hiking, kayaking, mountain biking, watching movies and visiting his family's camp along the Eastern Shore of Nova Scotia.

Reader Feedback: The ***Diagnostic Update*** group invites comments or suggestions for future topics in the newsletter. Please submit your comments to *Dr. Cornelia (Cora) Gilroy* (cgilroy@upei.ca), Diagnostic Services Laboratory, Atlantic Veterinary College, UPEI, Charlottetown, PE, C1A 4P3 and they will be forwarded appropriately.

Answer to What is Your Diagnosis on page 3: Codocytes, also known as target cells, result from a central bulge in the cell due to an increased ratio of cell membrane to hemoglobin content. Codocytes are commonly associated with regenerative anemias because young erythrocytes have excess membrane to hemoglobin content. Codocytes are seen in situations of excess erythrocyte membrane such as hepatic, renal and lipid metabolism disorders, and with hypochromic states such as iron deficiency.

Contributor: Dr. Noel Clancey