

Pathology & Microbiology Newsletter Atlantic Veterinary College University of Prince Edward Island Issue 66 October, 2023



2023 Recipient of the University Research Excellence Award



Dr. Mark Fast received a 2023 University Research Excellence Award which was announced during the university Celebration of Colleagues event on May 25, 2023.

This award recognizes faculty members for outstanding research and scholarly accomplishments and significant contribution to advancing the University's national and International reputation for research excellence.

Congratulations Mark!

2023 Recipient of the Zoetis Carl J. Norden Distinguished Teacher Award



Congratulations to **Dr. Russell Fraser** who has been selected as the recipient of the 2023 Zoetis Carl J. Norden Distinguished Teacher Award.

This is the highest teaching award given by each North American Veterinary College. The award was presented at the AVC Recognition Night this Fall, on October 4, 2023.

Congratulations Russ!

Acting Chairs of Pathology & Microbiology



Dr. Mark Fast, Chair of Pathology and Microbiology, is on sabbatical leave from July 1– December 31, 2023.

Drs. Shannon Martinson & Dave Speare served as Acting Chairs in July and August.

Dr. Chelsea Martin (pictured at left) is serving as the Acting Chair of the Department of Pathology and Microbiology during the remainder of Dr. Fast's sabbatical leave.

Nicole Murphy Receives 2023 Dean's Award of Excellence for AVC Staff



Congratulations to **Nicole Murphy** in receiving one of the 2023 Dean's Award of Excellence for AVC Staff. Nicole has been a dedicated AVC staff member for over two decades as a key player in parasitology research, teaching, and diagnostic work. Nicole has greatly contributed to the success of multiple parasitologists, graduate students, DVM students, and has supported other faculty members in the Pathology and Microbiology department. Nicole has played a vital teaching role in the success of the laboratory component of VPM 1220, as well as the parasitology section of the VPM 4500 diagnostic rotation for many years. She has taught and supported many AVC veterinary students and has been a patient, dedicated and fun teacher. Additionally, Nicole has contributed to the provision of parasitology education outside of AVC with **Dr. Gary Conboy**, with whom she also

supported several research endeavors. Nicole is currently dedicating most of her time to the AVC Diagnostic Services Laboratory by providing high-quality service to clients and colleagues. When it comes to her diagnostic work, Nicole's experience and knowledge are second to none. In her role as lead parasitology technician, she has also trained and supported new staff members and students by sharing her vast expertise. Nicole was nominated for her award by no less than 7 faculty and staff members. The AVC is very fortunate to have such an excellent, generous, and kind team player on staff who continuously goes above and beyond the norm. Thank you Nicole for your ongoing dedicated, excellent, valuable service.

Photo (L to R): Dr. John vanLeeuwen, Ms. Nicole Murphy, Dr. Nina Germitsch.



Pathology and Microbiology Faculty Funding Success

Congratulations to **Dr. Nina Germitsch** for receiving a NSERC discovery grant and a discovery launch supplement for her project, "Atlantic Canada's emerging parasites and their impact on naïve canid hosts". The award is for a 5-year term at \$33,000 per year and includes a one time \$12,500 Discovery Launch Supplement.

Congratulations to **Dr. Nina Germitsch** and collaborators Drs. Pat Murphy and Stevan Springer for being awarded \$15,000 for their project, "Genome assembly and proteome characterization of the freeze-tolerant parasite *Crenosoma vulpis*" which was entered in the basic science pool of the AVC Internal Research Fund competition.



Congratulations to **Dr. Lisanework Ayalew** for receiving a discovery grant in the amount of \$33,000 per year for 5 years, a one-time discovery launch supplement of \$12,500 and an AVC Graduate Student Stipend Support Fund (AVC GSSSF) award of \$30,000. The project was titled, "Impact of the avian reovirus S1 genomic segment evolutionary non-synonymous single nucleotide polymorphisms (nsSNPs) on virus-host cell interactions".

Graduate Student Success



Congratulations to **Eyesun Fajei**, PhD student in Pathology and Microbiology. Eyesun was selected as the 2023 graduate student recipient of the G. Murray and Hazel Hagerman Scholarship. The amount of the scholarship is \$4,605. Eyesun was recognized as the award recipient at the AVC Fall Recognition Night held on Wednesday, October 4th, 2023.

Eyesun also successfully completed her PhD comprehensive examination on July 27, 2023. Eyesun is supervised by **Dr. Mark Fast** and **Dr. Dave Speare** chaired the examination committee.

Thank you to the 2023 Pathology & Microbiology Summer Students

Congratulations to the 2023 summer students for their hard work and contributions to our department!

Savannah Christmas, VetSRA student supervised by Dr. Russ Fraser

Laura Groves, VetSRA student supervised by Dr. Mark Fast

Clare Henderson, VetSRA student supervised by Drs. Nina Germitsch and Megan Jones

Paige Mitchell, VetSRA student supervised by Drs. Megan Jones and Shannon Martinson

Kisa Storey, VetSRA student supervised by Dr. Mark Fast

Carissa Grove, Wildlife Avian Pathology student supervised by Dr. Megan Jones

Report on a New Species of the Nematode Genus Huffmanela



In a collaboration between the University of Prince Edward Island and the University of Veterinary Medicine, Vienna, **Drs. Reza Ghanei-Motlagh** (Post-doctoral Fellow, photo to left), **Mark Fast**, David Groman and Austrian collaborators reported a new marine species of the *Huffmanela* genus. This work was based on morphological and morphometric analyses of the nematode eggs and provided the molecular sequences of a teleost-associated species belonging to the genus for the first time. Huffmanellosis is a nematode infection caused by trichosomoidids of the genus *Huffmanela* which occurs in both freshwater and marine fish.

https://parasitesandvectors.biomedcentral.com/articles/10.1186/s13071-023-05772-7

AJVR Manuscript Trending

Congratulations to **Dr. Frederick Kibenge** whose article in the American Journal of Veterinary Research (AJVR) was one of the most mentioned research outputs for AJVR in the last quarter.

<u>Altmetric – A One Health approach to mitigate the impact of influenza A virus (IAV) reverse zoonosis is by</u> vaccinating humans and susceptible farmed and pet animals

Pathology and Microbiology Welcomes New Anatomic Pathology Resident



Welcome to **Luis Garcia**, a new anatomic MVSc / Residency in Pathology and Microbiology supervised by **Drs. Russ Fraser** and **Chelsea Martin.** He attended veterinary school at St. George's University in Grenada and graduated in January 2022. He was born and raised in sunny San Diego, California, and loves travelling. Before veterinary school, he worked in research with laboratory animals as a laboratory technician at the University of California, San Diego. Over the years he has volunteered with various wildlife rehabilitation centers in California, Minnesota and New Jersey. He has two dogs: Pudd, a Grenadian Pothound, and Lucille, a Spaniel-Staffordshire Terrier mix. During his free time, he enjoys birding, puzzles, listening to techno, and playing board games and video games with his wife, Virginia. He is looking forward to getting back into running and SCUBA diving during his residency program while also exploring and diving deep into the micro-universe of histopathology!

Pathology and Microbiology Welcomes New Clinical Pathology Resident



Welcome to **Dr. Matthew Yeung** to Pathology and Microbiology. Matt is doing a MVSc / Residency program in Clinical Pathology and is supervised by **Drs. Cora Gilroy** and **Noel Clancey.** During his time in practice, Matt found fulfillment in helping his patients through understanding and diagnosing diseases, and so decided to pursue clinical pathology. You may have seen samples submitted by him this summer, as he locumed briefly with the AVC emergency service. Matt is originally from Hong Kong. He has lived in the UK and has ties to New Zealand through his time at Massey University and working in Auckland. Prior to joining AVC, Matt interned and practiced emergency medicine at the University of Saskatchewan. Outside of veterinary medicine, Matt enjoys outdoor walks, music, food and exercise. He is hoping to get back into soccer when fit again.

Pathology and Microbiology Welcomes New Post Doctoral Fellow



The Department of Pathology and Microbiology welcomes Dr. Manuel Soto-Davila, post-doctoral fellow under the supervision of Dr. Mark Fast in collaboration with Cooke Aquaculture Inc. This post-doctoral project will focus on Atlantic salmon complex gill disease. Manuel completed his BSc (Marine biology) in Chile in 2016 and started his MSc in aquaculture program under Dr. Santander's supervision at Memorial University in 2017. After graduating in 2019, Manuel started his PhD in fish immunology under Dr. Dixon's supervision at the University of Waterloo. Manuel's thesis focused on determining the causes of disease susceptibility, physiology, and resistance in triploid Chinook salmon and the compensatory mechanisms that can ultimately reduce the risk of disease. Additionally, the performance of triploid salmon can be improved by probiotic diet supplementation. He defended his PhD in September 2023 and started his post-doctoral research funded by the MITACS Elevate program. Currently, Manuel is focused on using molecular biology tools to determine the genes and pathways underlying the response and resistance of Atlantic salmon to bacterial pathogens causing significant losses in Atlantic salmon aquaculture of Canada.

Pathology and Microbiology Welcomes New PhD Student



The Department of Pathology and Microbiology welcomes PhD student **Shelby Reimer**. Her MITACs funded project will focus on population dynamics and the genetic basis for SLICE resistance in Pacific populations of sea lice under the supervision of **Dr. Mark Fast.** Shelby completed her BSc in Biology at Vancouver Island University in 2018, followed by her MSc in Medical Microbiology at University of Manitoba in 2021. She was focusing on antimicrobial resistance in bacterial pathogens using molecular and genomic techniques. Shelby was born and raised on Vancouver Island, BC, and in her free time can be found mountain biking, hiking, trail running, camping and kayaking along the Pacific coast.

Recipient of AVC SRLP Poster Award



Congratulations to **Clare Henderson** (Class of 2026) who joined the Pathology & Microbiology Department for a 12week summer research project. She investigated lung and heart parasites of Newfoundland coyotes under the supervision of **Drs. Nina Germitsch** and **Megan Jones**. Clare received an AVC Veterinary Summer Research Award and participated in the AVC Summer Research and Leadership Program (SRLP). She dissected hearts and lungs of 109 Newfoundland coyotes and looked for parasites. Her research revealed that 56% of Newfoundland coyotes are infected with the French heartworm *Angiostrongylus vasorum* and 5.5% are infected with *Crenosoma vulpis*. Clare's research is the first to describe the *A. vasorum* prevalence in Newfoundland coyotes and her work strengthened the hypothesis that the lung parasite

Capillaria aerophila is not present in Newfoundland. Clare won the first prize in this year's AVC SRLP Poster competition. In October she has the opportunity to present her research at the Canadian Emerging Veterinary Scholars Summit in Calgary. Clare plans on continuing her research next year to further investigate prevalence and distribution of lung and heart parasites in Newfoundland coyotes.

Presentation at the STLHE Conference



Dr. Cornelia Gilroy presented at the round table discussion session on "Dissonance in Identity Formation: Educator versus Health Professional" at the 2023 Society for Teaching and Learning in Higher Education Annual Conference (STLHE). It was held in Charlottetown, PEI, from June 13-16, 2023.

Chinook Project 2023



The Chinook Project was once again able to travel to Northern Canada and provide veterinary care to the community of Sheshatshiu, Labrador, an Innu community. Dr. Stephanie Landry (AVC 2010) and Melissa Hamel led the team with five fourth year students: Cortney Chadbourne, Sam Froud, Jamie Kennedy, Chris Knapp, and Ane Johnsen. Dr. Jess Rose (AVC 2021) met the team in Labrador, flying in from St. John's. Dr. Rose was selected in 2020 to be a student on the Chinook Project, which was cancelled due to COVID-19. Now, Dr. Rose works with Dr. John Ruffino (AVC 2010 and past leader of several Chinook teams), and we were delighted to have Jess join us as a veterinarian.

The project has been to Sheshatshiu before (2014, 2016, 2018), and was scheduled to travel there in 2020. Three years later, our team arrived, and set up the clinic in the gymnasium of the old school. Local liaisons built a plywood surgical suite inside the gym and supplied many of the supports needed, such as accommodations and food.



Thank you to Greg Pastitshi and the Sheshatshiu Band Council. 145 animal visits occurred, comprised of 99 medical appointments and 46 surgeries. A highlight for the



team was a helicopter ride over the landscape of Labrador. We are grateful to the government of Newfoundland and Labrador for their support (and Dr. Beverly Dawe), as well as Zoetis, Boehringer Ingelheim, and Vetoquinol. The Chinook Project remains committed to 1) helping the (domestic) animal population in Northern communities with their permission and invitation 2) the spectrum of care: providing an educational opportunity for students and veterinarians in providing essential services with minimal resources 3) fostering relationships with communities and stakeholders 4) encouraging a multidisciplinary experience by requiring students to craft non-fiction creative essays or projects. Plans are underway for the 2024 rotation. www.chinookproject.org.







New Species for CWHC Atlantic at AVC

On August 8, 2023, the Canadian Wildlife Health Cooporative (CWHC) Atlantic performed a necropsy on a great white shark that had been found dead at Greenwich Beach, PEI National Park. **Drs. Megan Jones, Amanda Clark, Maricruz Guevara**, and **Luis Garcia**, wildlife technician **Darlene Jones**, wildlife summer student **Carissa Grove** (AVC Class of 2026), and pathology technician Elliott Christopher performed the necropsy. The shark was a juvenile male weighing 215 kg, and was 2.69 meters in total length.

This is the first great white shark received at CWHC Atlantic at AVC, although colleagues at the Marine Animal Response Society have performed field necropsies on three additional animals since October 2022 and their tissues are being examined by **Dr. Laura Bourque**. The Atlantic white shark population is listed as endangered in Canada; data from these animals will contribute to our understanding of threats to the species.



Batty Adventures: Learning about PEI Bats with the CWHC Atlantic Team

This summer, the Canadian Wildlife Health Cooperative (CWHC) Atlantic bat team presented at several outreach events to spread the word about PEI's bat species. These included the AVC Summer Academy, the Dr. Tim Ogilvie AVC Junior and Senior Vet Camps, and the Wild Child PEI Young Ecologists Camp.



Local bat experts **Tessa McBurney** (MSc/ DVM student, CWHC Atlantic), **Jordi Segers** (National Bat Health Coordinator, CWHC National Office), and **Darrian Washinger** (Atlantic Bat Conservation Project Technician, CWHC Atlantic) volunteered to give presentations and lead bat walk field trips to teach the participants about the importance of bats and their habitats.



On July 6, **Darrian Washinger** led the field trip for AVC Summer Academy in collaboration with PEI National Park. For the first half of the day, 24 high school graduates, undergraduate students, and university graduates travelled to PEI National Parks Dalvay Field Office. Lindsey Burke, a Resource Management Officer with Parks Canada, gave a short presentation on the resource conservation initiatives in PEI National Park, offering insight into the park ecosystems, various species at risk, and the Park's ongoing bat monitoring efforts. Darrian followed with a presentation on bat diversity and the ecological services they provide, ecology of PEI bats, and survey methods for bats. After the presentations, Darrian led a forest walk around the Farmlands Trail, pointing out different ecosystems, suitable bat habitats, and how the environment was impacted by post-tropical storm Fiona. The field trip ended by breaking off into groups and deploying bat acoustic detectors in suitable bat habitats by getting creative with the limited field equipment provided (duct tape and zip ties).

The AVC Junior Vet Camp was hosted July 10–14 and July 17-21; each week dedicated to approximately 50 students entering grades 7, 8, and 9. For both weeks, Jordi or Tessa spent an hour sharing information on bat basics, ecology, and local habitat use by PEI bats, while also answering a high volume of guestions from the engaged students. The following day, Tessa led field trips in collaboration with PEI National Park similar to the one described above. She took the students to the Farmlands Trail to explore the different ecosystems, learn about local flora and fauna, observe bat monitoring activities (acoustic surveys and mist net surveys), and play an engaging nature-themed bingo scavenger hunt. The participants enjoyed tracking down the different nature-themed items, with a leopard frog being the most exciting find, and were rewarded with wildlife stickers!





The last summer outreach event was with Wild Child PEI for their Young Ecologists Camp hosted from July 31—August 4 at Strathgartney Provincial Park. This day camp was offered for 13 girls and gender-minority youth ages 11–15 to explore nature and engage in various ecological activities with regional guest scientists. Tessa and Darrian displayed mounted bats, demonstrated equipment use for various bat monitoring activities, and set up a mist net with plastic bats for the participants to practice extracting "captured bats" from the fine net. They were an engaged audience, asking many questions about bats around the world, threats to local bats, and how to become a chiropterologist.

A Podcast on Reverse Zoonoses



Dr. Frederick Kibenge is the author of "A One Health approach to mitigate the impact of influenza A virus (IAV) reverse zoonosis is by vaccinating humans and susceptible farmed and pet animals" in the American Journal of Veterinary Research (https://doi.org/10.2460/ajvr.23.03.0053) and "Continuous surveillance and viral discovery in animals and humans are a core component of a one-health approach to address recent viral reverse zoonoses," in the Journal of the American Veterinary Medical Association (https://doi.org/10.2460/javma.23.03.0148). He was invited to discuss reverse zoonoses in a recent podcost hosted by Drs. Sarah Wright and Lisa Fortier. (https://podcasts.google.com/feed/ R0cHM6Ly9mZWVkcy5idXp6c3Byb3V0LmNvbS8yMDQ3NDQ4LnJzcw/episode/QnV6enNwcm91dC0xMjg4MTA0Nw?

Publications

Fontana CM, Terrin F, Facchinello N, Meneghetti G, Dinarello A, Gambarotta L, Zuccarotto A, Caichiolo M, **Brocca G**, Verin R, Nazio F, Carnevali O, Cecconi F, Bonaldo P, Dalla Valle L. Zebrafish *ambra1b* knockout revels a novel role for Ambra1 in primordial germ cells survival, sex differentiation and reproduction. Biological Research 2023:56;19 https://doi.org/10.118s40659-023-00430-9

Mandrioli L, Barbé T, Bonazza Foselli M, **Brocca G**, Verin R, Errani F, Volpe E, Montesi F, Sirri R, Morini M, Budai J, Toffan A, Ciulli S. Cutaneous angiomatosis-like presentation in koi carp (*Cyprinus carpio* koi): Clinical-pathological investigations. Journal of Fish Diseases 2023;46(7):723-730. <u>https://doi.org/10.1111/jfd.13781</u>

Marchiori E, Quaglio F, Franzo G, **Brocca G**, Aleksi S, Cerchier P, Cassini R, Marcer F. Pearl formation associated with gymnophallid metacercariae in *Mytilus galloprovincialis* from the Northwestern Adriatic coast: Preliminary observations. Journal of Invertebrate Pathology 2023:196;107854. <u>https://doi.org/10.1016/j.jip.2022.107854</u>.

Bertram CA, Marzahl C, Bartel A, Stayt J, Bonsembiante F, Beeler-Marfisi J, Barton AK, **Brocci G**, Gelain ME, Gläsel, du Preez K, Weiler K, Weissenbacher-Lang C, Breininger K, Aubreville M, Maier A, Klopfieisch R, Hill J. Cytologic scoring of equine exercise-induced pulmonary hemorrhage: Performance of human experts and a deep learning-based algorithm. Veterinary Pathology 2023:60(1);75-85. <u>https://doi.org/10.1177/03009858221137582</u>

Groves L, Whyte SK, Purcell SI, Michaud D, Cai WC, Garber AF, Fast MD. Temperature impacts Atlantic salmon's (*Salmo salar*) immunological response to infectious salmon anemia virus (ISAv). Fish and Shellfish Immunology Reports 2023:4;100099. <u>https://doi.org/10.1016/j.fsirep.2023.100099</u>.

Ghanei-Motlagh R, Fast MD, Groman D, Kumar G, Soliman H,El-Matbouli M, Saleh M. Description, molecular identification and pathological lesions of *Huffmanela persica* sp nov. (Nematoda: Trichosomoididae: Huffmanelinae) from daggertooth pike conger *Muraenesox cinereus*. Parasites and Vectors 2023:16:182. <u>https://doi.org/10.1186/s13071-023-05772-7</u>.

Cocco A, Toson M, Perolo A, Casarotto C, Franzago E, **Brocca G**, Verin R, Quaglio F, Dalla Pozza M, Bille L (2023). Nodular gill disease in Northeastern Italy: An investigation on the prevalence of the disease and the risks of introduction in rainbow trout farms. Journal of Fish Diseases 2023;46(1):1021-102828. <u>https://doi.org/10.1111/jfd.13821</u>

Braden LM, Michaud D, Groman D, Byrne P, Hori TS, Fast MD. Rejection of *Lepeophtheirus salmonis* driven in part by chitin sensing is not impacted by seawater acclimitization in Coho salmon (*Oncorhynchus kisutch*). Scientific Reports 2023:13;9685 <u>https://doi.org/10.1038/s41598-023-36632-0</u>

Saab ME, Vanier G, **Sudlovenick E**, Powell AL, Simonee J, Desmarais G, **Muckle CA**, Fairbrother JM, **Daoust P-Y**. Occurrence and antimicrobial resistance of *Salmonella* species and potentially pathogenic *Escherichia coli* in freeliving seals of Canadian Atlantic and eastern Arctic waters. Zoonoses Public Health. 2023; 70(6):542-554. https://doi.org/10.1111/zph.13064.

Sokolov SG, Khrustalev AV, Greenwood SJ, Gray CN, Robbins WT, **Jones MEB**, Voropaeva EL, Kalmykov AP, Dzhamirzoev GS, and Atopkin DM. Phylogenetic assessment of Apophallines (Digenea: Opisthorchiidae) with revision of *Apophallus donicus* Skrjabin & Lindtrop, 1919 complex and some taxonomic propositions. Systematics and Biodiversity 2023;21(1): 2189898. https://doi.org/10.1080/14772000.2023.2189898

Greenwood SJ, **Decelles N, Jones MEB, Daoust PY**. Renal coccidial infection in North American Northern gannets (*Morus bassanus*). Journal of Wildlife Diseases 2023;59 (4):780-785. <u>https://doi.org/10.7589/JWD-D-22-00178</u>

Alkie TN, Cox S, Embury-Hyatt C, Stevens B, Pople N, Pybus MJ, Xu,W, Hisanaga T, Suderman M, Koziuk J, Kruczkiewicz P, Nguyen HH, Fisher M, Lung O, Erdelyan CNG, Hochman O, Ojikic D, **Yason C**, Bravo-Araya M, **Bourque L**, Bollinger TK, Soos, C, Giacinti J, Provencher J, Ogilivie S, **Clark A**, MacPhee R, Parsons GJ, Eaglesome H, Gilbert S, Saboraki K, Davis R, Jerao A, Ginn M, **Jones MEB**, Berhane Y. Characterization of neurotropic HPAI H5N1 viruses with novel genome constellations and mammalian adaptive mutations in free living mesocarnivores in Canada. Emerging Microbes & Infections 2023: 12, e2186608 https://doi.org/10.1080/22221751.2023.2186608

Braden LM, Michaud D, Groman D, Byrne P, **Hori TS**, **Fast MD**. Rejection of *Lepeophtheirus salmonis* driven in part by chitin sensing is not impacted by seawater acclimitization in Coho salmon (*Oncorhynchus kisutch*). Scientific Reports 2023:13;9685 <u>https://doi.org/10.1038/s41598-023-36632-0</u>

Reinhart B, Gilroy C, Clancey N, Burton S. Stull JW, Bishop N, Thakur K. Impact on canine neutrophil preservation with the addition of bovine serum albumin to K_3 -EDTA whole blood samples. Veterinary Clinical Pathology. 2023; 52 (3):396-401. <u>https://doi.org/10.1111/vcp.13217</u>

Clancey N, Burton S, Gilroy C, Saunders J. Methodology-related pseudohyperkalemia associated with marked muscle enzyme leakage in a dog. Veterinary Clinical Pathology 2023: 52(3):475-481. <u>https://doi.org/10.1111/vcp.13242</u>

Alkie TN, Byrne AMP, **Jones MEB**, Mollett BC, **Bourque L**, Lung O, James J, Yason C, Banyard AC, Sullivan D, Signore AV, Lang AS, Baker M, Dawe B, Brown IH, Berhane Y. Recurring Trans-Atlantic incursion of Clade 2.3.4.4b H5N1 viruses by long distance migratory birds from Northern Europe to Canada in 2022/2023. Viruses 2023:15;1836. https://doi.org/10.3390/v15091836

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