

Potential Research Concepts for VetSRA Summer 2019

Faculty Mentor	Faculty Email Address	Research Topic
Biomedical Sciences		
Dr. Spencer Greenwood	sgreenwood@upei.ca	<p>Disease ecology of avian parasite <i>Trichomonas gallinae</i>: Sampling different wildlife and domestic populations to explore genetic diversity and transmission routes of an emerging disease. The student will learn; <i>in vitro</i> culture from clinical samples, conduct viability assays for survival in seed and molecular characterization via PCR, sequencing and phylogeny reconstruction.</p> <p>Molecular characterization of helminths from marine mammals and wildlife: Post-mortem cases (and archived samples) from wildlife and marine mammals will be screened for helminths. Morphological diagnosis will be confirmed by PCR, sequencing and phylogeny reconstruction.</p>
Dr. Sunny Hartwig	shartwig@upei.ca	<p>1) Development of a canine genetic testing program at AVC</p> <p>2) Assessment of the prevalence of leptospirosis on PEI.</p>
Dr. Paul Bernard	pbernard@upei.ca	<p>1) Do deficits in auditory communication underlie social abnormalities associated with autism?</p> <p>It is unknown if abnormal auditory function contributes to the social deficits associated with autism spectrum disorders. A behavioral testing paradigm to thoroughly assess auditory communicative deficits associated with neurodevelopmental disorders is lacking. Goal: <u>We will develop a behavioural test battery to assess auditory communication in clinically relevant rodent models of autism.</u> Our studies may suggest that targeting auditory processing is a viable strategy to rescue social deficits associated with autism.</p> <p>2) Ultrasonic vocalizations: A non-invasive ethologically relevant tool to assess home cage welfare in rats.</p> <p>We propose to monitor rat ultrasonic vocalization frequency and call pattern, as an ethologically sensitive measure to assess rat welfare in various levels of home cage enrichment. We will compare this novel</p>

		method of assessing home cage rodent stress/welfare to a traditional metric of rodent stress; fecal cortisol levels. Demonstrating that ultrasonic vocalizations can be used to assess home cage wellbeing will be a major advance in laboratory animal care.
Dr. Collins Kamunde	ckamunde@upei.ca	Effect of temperature on cellular reactive oxygen species metabolism and redox status The project will investigate the mechanisms underpinning how temperature modulates cellular reactive oxygen species (ROS) metabolism and redox status. Specifically, mitochondria and cardiomyocytes/hepatocytes will be isolated from fish (rainbow trout) exposed to thermal stress and used to delineate the roles and relative contributions of mitochondrial and extramitochondrial compartments in ROS metabolism and redox status.
Companion Animals		
Dr. Etienne Côté	ecote@upei.ca	In veterinary cardiology, medications often alter serum electrolyte concentrations. Recheck appointments for animals receiving cardiac medications are frequent, and involve bloodwork to measure serum potassium levels in particular. The test tubes into which these samples are drawn have been shown to alter the potassium level artificially, which could have important repercussions on treatment decisions. Even so, no quantification of that effect has been undertaken in veterinary cardiology. We propose to have a student help design and execute a brief clinical study in the AVC Cardiology Service. Dogs having blood drawn will have the blood sample separated into two different types of test tubes (one plain, red-top tube; the other anti coagulated with heparin, green-top tube) and the potassium concentration will be measured on both. Results will help veterinarians who treat heart disease to better interpret and act on bloodwork results in their patients.
Dr. Lynne O'Sullivan	mosullivan@upei.ca	Teaching in veterinary cardiology and the student learning experience could be enhanced by the availability of a searchable high-quality digital library of clinical material. This library could be eventually used in class or laboratory settings, during clinical rotation activities, and for student access on their own time. To this end, we propose to have a student help build materials for such a digital library by compiling, digitizing, cataloging, annotating, and organizing

		<p>veterinary cardiology content including heart sound recordings, graphics and videos of cardiac diagnostics (ECGs, radiographs, cardiac ultrasound images), and complete case studies. This would be the first step in building such a digital library, which could serve as an online resource for self-directed learning for students.</p>
Dr. Michelle Evason	mevason@upei.ca	<p>Dr. Evason's research is a continuation of her PhD project, which was the launch and establishment of a longitudinal (lifetime) canine health and Lyme disease study performed on dogs in Eastern Canada. The study goal is to gain insight from data that may help better manage Lyme disease, and also explore multiple aspects of pet health and welfare (e.g. nutrition, obesity, vaccination, deworming, and human-animal bond) as we monitor the dogs (and their families) over multiple years. Use of these dogs, their families and participating veterinary clinics as sentinels for various infectious disease (focus on Lyme) may also help unlock answers that relate human health, particularly for emerging Lyme endemic regions in Canada. Educational partnerships between general practice veterinary clinics and collaborating veterinary schools, such as the Atlantic and Ontario Veterinary College, are a critical part of this study's preliminary success and have far-reaching bonds and impact across the Canadian veterinary community at all levels (e.g. veterinary undergraduate and graduate student involvement, local general practitioners etc).</p>
Health Management		
Dr. Javier Sanchez	jsanchez@upei.ca	<p>We will be looking for students to work on Antimicrobial stewardship, antimicrobial resistance (AMR) and animal welfare in dairy farms. These activities will contribute to a research programme on dairy health. Specific projects will explore:</p> <ol style="list-style-type: none"> 1) the use of standard phenotypic and metagenomics approaches for the early detection and control of the emergence of antimicrobial resistance in dairy farms in support of antimicrobial prudent use guidelines to improve antimicrobial therapies; 2) development of novel, rapid Matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF)-based methods for identification of antimicrobial resistance in bovine mastitis isolates and

		3) Cow longevity impacts of calf management practices.
Dr. J McClure	jmclure@upei.ca	There will be 3 positions available associated with cattle, including work with Johne's disease, on farm antimicrobial use and resistance, and maybe one on bovine leukosis and BVD.
Dr. Bronwyn Crane	mbrane@upei.ca	Investigate sanitation practices for bovine intravaginal progesterone releasing device applicators and their potential role in the transmission of <i>U. diversum</i> and other bacteria. The student would travel to local farms, complete a survey about sanitation practices for the applicators, swab the exterior surface following regular use, and then we would perform <i>U. diversum</i> PCR and routine aerobic culture.
Dr. Ben Stoughton	wbstoughton@upei.ca	<p>Prevalence of anthelmintic resistant cyathostomes on Prince Edward Island horse farms</p> <p>Widespread over use of anthelmintics (dewormers) in North America has produced a growing population of parasites in horses that are resistant to control measures. This poses a serious threat to the welfare of horses and future efficacy of parasite control programs on horse farms. Currently the prevalence of anthelmintic resistance nematodes on Prince Edward Island (PEI) horse farms is unknown. <u>Therefore, we propose an investigation to determine the prevalence of anthelmintic resistance nematodes on PEI.</u> To detect anthelmintic resistance, we will utilize the widely accepted fecal egg count reduction test (FECRT) which requires paired, pre- and post-treatment McMasters fecal exams. Results from the pre-treatment fecal egg count will allow horses to be categorized as low, moderate, or high shedders, and direct selective treatment strategies.</p> <p>By comparing the paired fecal egg counts in treated horses and grouping the data by farm we will be able to determine the level of anthelmintic resistance on each participating horse farm in PEI. In addition to measuring the prevalence of anthelmintic resistance, the data gathered will improve veterinarian designed parasite control programs, client education, animal welfare and minimize future anthelmintic resistance development on specific farms.</p>
Dr. Laurie McDuffee	lmcduffee@upei.ca	<p>1) Equine behaviour modification and stress during various husbandry routines, veterinary routines and riding programs.</p> <p>2) A PRISMA (preferred reporting items for systematic reviews and meta-analyses) strategy for conducting a scoping review of stress and burnout among veterinary students and the</p>

		extent to which student experiences predict perceived stress in practice.
Dr. Mary McNiven	mcniven@upei.ca	The effect of oil supplementation on blood parameters and fatty acids in racing Standardbred horses. Is there an effect of omega-3 vs. omega-6 oil on racing performance too?
Dr. Martha Mellish	mmellish@upei.ca	<p>Assessment of welfare of Sable Island horses through morphometric and radiographic hoof evaluation.</p> <p>No hoof care is provided to the horses of Sable Island. Digital photographing and measurement of 363 hooves from Sable Island horses, will allow for evaluation of hoof abnormalities. Radiographs of the distal phalanx will help assess hoof conformation as well as pathology of the hoof capsule and its bony structures. Determining the frequency and severity of hoof abnormalities present in the population of horses that died naturally on Sable Island will provide a basis for determining the current state of hoof health of live horses on the island.</p>
Pathology and Microbiology		
Dr. Mark Fast	mfast@upei.ca	<p>MICCSA – Mitigating the impacts of climate change on salmon aquaculture</p> <p>The goal of the our project in 2019 is to characterize the responses of Atlantic salmon to vaccination and pathogen exposure under the challenges of increasing water temperatures and reduced oxygen, which are forecast due to climate changes in the North Atlantic over the next several decades. Through characterizing these responses, we plan to identify heritable markers for growth and immunological competence for Canadian broodstock programs under these future environmental scenarios, which will assist the salmon culture industry in meeting these challenges. The summer student will have the opportunity to assist in carrying out vaccination and challenge experiments at AVC, as well as Huntsman Marine Science Centre in St. Andrews, NB, using important pathogens impacting Atlantic Canada's industry (sea lice and ISA). The student will also get the opportunity to learn molecular techniques used for characterizing immune responses in salmon, which have application for all other species in veterinary medicine.</p> <p>There should also be projects on:</p> <ol style="list-style-type: none"> 1. Wild/cultured Atlantic sturgeon health assessment. 2. Application of functional feeds in Atlantic salmon to ameliorate the impact of co-infection.

Dr. Megan Jones	mejones@upei.ca	Sarcoptic mange in red foxes in Prince Edward Island: geographic distribution, serosurvey, and pathologic characterization of lesions.
Dr. Anne Muckle	cmuckle@upei.ca	Development and validation of a multiplex PCR enteric pathogen panel for equines: The specific objective is to screen for <i>Salmonella</i> and <i>Clostridium perfringens</i> directly from fecal samples in new equine patients at the AVC Large Animal Hospital.
Dr. Anne Muckle Dr. Gerald Johnson	cmuckle@upei.ca gjohnson@upei.ca	Working with Halibut PEI Inc and Atlantic Veterinary College, the project involves isolating, describing and testing bacteria associated with the culture of artemia (brine shrimp) for feeding to larval Atlantic halibut. The bacteria involved are important to larval survival in the production of juvenile halibut for the aquaculture industry. Several compounds are used to control bacterial overgrowth in artemia culture conditions. This project will attempt to determine the efficacy of these compounds using live artemia in 24 well plates and dilutions of the chemicals. The project will involve work and sampling at the halibut farm in Victoria PEI as well as laboratory work at AVC.