



ROSS UNIVERSITY SCHOOL OF VETERINARY MEDICINE

RESEARCH AND POSTGRADUATE STUDIES PROGRAM

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RESEARCH VOLUNTEER AND ASSISTANTSHIP OPPORTUNITIES

2020 – 2021

If you are interested in becoming a Research Assistant or Research Volunteer for any of the listed projects, or would like to inquire for more information about the research, please contact the project's Principal Investigator (PI).

RESEARCH ASSISTANT (RA)

The Research Assistant (RA) position is designed to give students hands-on introduction to independent research. RAs devote up to 25 hours (paid) to a specific project during a semester. Upon completion, the RA is expected to present the results of their work at a RUSVM forum. If judged of high quality, the RA will be eligible for a travel grant to allow them to present their work at a scientific conference.

RESEARCH VOLUNTEER (RV)

The Research Volunteer (RV) position is designed to allow students to observe certain aspects of how research is conducted. RVs have no specified time commitment to a project and will likely not have a focused personal project on which to work. There is no stipend and no expectation of presentation of research results for RVs.

CENTER 1: ONE HEALTH CENTER FOR ZONOOSES AND TROPICAL VETERINARY MEDICINE

Project Title	PI(S)	Contact	# RAs	# RVs	Project Description
Detection and molecular characterization of viruses in pigs and wildlife in the Caribbean and Central America	Ghosh, S. Morales, A. Castillo Fortuna, Y. Becker, A. Navarette-Talloni, M.J.	sghosh@rossu.edu	0	10	This project consists of two components. The first component aims to detect and molecularly characterize circoviruses, rotaviruses and picobornaviruses in various wildlife species, and is expected to provide vital insights into virus evolution and diversity including discovery of novel viruses, host-range, and interspecies transmission. The second component aims to (i) study porcine circovirus 3, an emerging threat to the pork industry, for the first time in the Caribbean region, and (ii) investigate the prevalence, genetic diversity and zoonotic potential of porcine rotaviruses in the Dominican Republic and Guatemala, with important implications on pork production and public health in the Caribbean and Central America.
Pathogenicity of Trichomonas tenax in periodontal diseases of the domestic dog	Yao, C.	chyao@rossvet.edu.kn	16	0	Successful completion of the proposed project will provide a user-friendly, rapid and reliable, and yet very sensitive molecular diagnosis of T. tenax infection in dogs and human that can be used at the point-of-care. It will determine correlations between T. tenax infection and the periodontal disease in canine species. Finally, it will identify virulence factors released in exosome of this trichomonad protozoan.
Physiological and immunological outcomes of type two diabetes mellitus and Plasmodium berghei malaria comorbidity in Sprague-Dawley rats	Mukaratirwa, S. Masola, B. Nyaba, Z.	smukaratirwa@rossvet.edu.kn	0	0	Due to drastic changes in life-style in many communities in developing countries, there is an increase in the prevalence of non-communicable diseases such as type 2 diabetes in P. falciparum-malaria endemic areas in developing countries, which has resulted in increased prevalence of co-morbidity cases. There are limited information on patho-physiological outcomes in human cases with co-morbidity of the two diseases. It is expected that the information generated from the experimental studies will contribute to the improvement in diagnosis (potential biomarkers), prognosis of both type 2 diabetes and malaria, as well as treatment and management of co-morbidity cases in developing countries.



CENTER 1: ONE HEALTH CENTER FOR ZOOSES AND TROPICAL VETERINARY MEDICINE *(Continued)*

Project Title	PI(S)	Contact	# RAs	# RVs	Project Description
Are ewes from Saint Kitts shedding <i>Coxiella burnetii</i> by vaginal, fecal, milk and placental routes?	Muller, A. Chapwanya, A. Conan, A. Mertens-Sholz, K.	amuller@rossvet.edu.kn	TBD	TBD	By understanding the <i>C. burnetii</i> shedding dynamics in ewes from meat flocks in Saint Kitts we expect to identify the groups (pregnant vs post-parturient; multiparous vs primiparous; abortion vs normal parturition) and routes (vaginal mucus, feces, milk, placenta) with higher risk of shedding, being potential sources of infection for animals and humans. Monitoring the shedding of <i>C. burnetii</i> in animals ultimately ensure readiness in the event of an epidemic.
Does perioperative administration of rabies vaccine in dogs undergoing surgical sterilization induce an adequate antibody response?	Peda, A. Knobel, D.	apeda@rossvet.edu.kn	1	0	Mass dog sterilization programs (spay and neuter) supported by non-governmental organizations or by governments can reach large numbers of dogs in low-resource areas. Rabies vaccination may often not be incorporated into mass surgical sterilization protocols, even in dog rabies endemic areas, because of a perception that rabies vaccine administered peri-operatively may not induce an adequate antibody response, resulting in significant missed opportunities to vaccinate large numbers of dogs. Our study will be the first to test the hypothesis that the proportion of dogs responding adequately to perioperative administration of rabies vaccine while undergoing surgical sterilization is not inferior to the expected standard proportion of responders, and so provide an evidence base for decision making.
Mobilization and molecular characterization of prophages in Caribbean isolates of <i>Dermatophilus congolensis</i>	Toka, F. Butaye, P.	ftoka@rossvet.edu.kn	1	3	Some isolates of <i>D. congolensis</i> from cattle on the Island of St. Kitts have acquired resistance against tetracycline. In this study we will isolated new lytic phages and mobilize the phages encoded by <i>D. congolensis</i> . This will be the first study determining the diversity and phylogeny of bacteriophages active against <i>D. congolensis</i> . The full characterization will allow us to assess the potential of bacteriophage therapy in the control <i>D. congolensis</i> . If therapy were possible, it would reduce the use of antimicrobials.
Investigation of a novel Ehrlichia species in cattle, <i>Rhipicephalus microplus</i> and <i>Rhipicephalus sanguineus</i> ticks from the Caribbean	Bouillon, J. Chapuis, R. Kelly, P.	jbouillon@rossvet.edu.kn	3	0	A novel Ehrlichia species closely related to Ehrlichia canis and Ehrlichia minasensis has recently been discovered in cattle of the Caribbean (Zhang et al.). This study will provide further information about this organism and determine whether it is Ehrlichia minasensis which has recently been recognized as the sixth species of the genus Ehrlichia (Cabezas-Cruz et al., 2016). This study will also investigate the presence of this novel species in cattle ticks on the Caribbean.
Evaluation of Environmental DNA Technology for Detecting Schistosoma mansoni in Low Transmission Areas of the Caribbean	Willingham, A.L. Mukuratirwa, S. Fenton, H. Sungupta, M. Stensgaard, A.S. Vennervalk, B.	awillingham@rossvet.edu.kn	1	0	Schistosomiasis, a water-borne blood fluke infection, was a leading cause of impaired health and socioeconomic development in the Caribbean region during the past century but is no longer considered a serious public health problem with limited to no transmission in historically endemic localities. The Project "Evaluation of Environmental DNA Technology for Detecting Schistosoma mansoni in Low Transmission Areas of the Caribbean" will bring together RUSVM, Caribbean and Danish scientists to examine the utility of a new technology that can determine the presence of <i>S. mansoni</i> through detection of its DNA in the environment (eDNA). The outcome of this pilot project will hopefully be validation of eDNA as a new sensitive and cost-effective tool for environmental surveillance of schistosomiasis in the Caribbean that can be used in the future for assessing and monitoring schistosomiasis elimination as well as detect the presence of other important water-borne parasitic diseases and aquatic organisms.
Effect of the use penicillin on the presence of ESBL enterobacteria in sheep faecal samples	Herve-Claude L.P. Chapwanya, A. Navarrete-Talloni, M.J.	lherveclaude@rossvet.edu.kn	4	4	This innovative project will improve One Health concepts congruent with relevant animal production and food safety aspects. It will evaluate the effect of the use of penicillin for surgical purposes in ESBL E. coli found in sheep feces. It will also introduce DVM students to One Health approaches that will be useful for their veterinary careers.

CENTER 2: CENTER FOR INTEGRATIVE MAMMALIAN RESEARCH

Project Title	PI(S)	Contact	# RAs	# RVs	Project Description
Effects of different continuous infusions of lidocaine on isoflurane minimum anesthetic concentration in chickens	Escobar, A. Maney, J. Dzikiti, T. B. Almeida, M. R.	aescobar@rossvet.edu.kn	2	0	Lidocaine is a local anesthetic that has been used as part of balanced anesthesia techniques in humans, dogs, horses and small ruminants. In addition to anesthetic-sparing effects, lidocaine promotes analgesia, anti-inflammatory and anti-arrhythmic effects, and it is a scavenger of free radicals (Valverde et al. 2004; Mama 2015; Pang 2015; Wilson & Shih 2015). While lidocaine has been extensively used in mammals as part of anesthetic protocols, studies in avian species are lacking, and this drug could be an alternative to the use of opioids and potentially improve analgesic and anesthetic care in avian species.



CENTER 2: CENTER FOR INTEGRATIVE MAMMALIAN RESEARCH (Continued)

Project Title	PI(S)	Contact	# RAs	# RVs	Project Description
Detection of <i>Angiostrongylus cantonensis</i> in rats from St. Kitts and Nevis – pilot study	Bolfa, P.	pbolfa@rossvet.edu.kn	2	2	<i>Angiostrongylus cantonensis</i> (AC) is an important rodent/snail-borne emerging parasite causing disease in humans (eosinophilic meningitis/neural angiostrongyliasis and occasionally ocular disease) in several parts of the world including the Caribbean, obviously originating from SE Asia. With recent emerging cases in Europe and United States, we believe that eventually it will get established in these locations. Rat collection, identification of <i>A. cantonensis</i> (rat lung worm - RLW) by molecular techniques followed by genotyping, will allow us to characterize and map the Caribbean strain, compare with invasive strains that have the capacity to become globally invasive and form the basis for future studies focused on phenotypic traits of the parasite, as part of larger grants (including mollusks, sentinel hosts and human cases).
Prevalence of the ABCB-1 mutation in dogs native to the island of St. Kitts	Cavanaugh, R. Silkworth, A. Cavanaugh, S.	rcavanaugh@rossvet.edu.kn	1	1	Some dogs, particularly herding breeds, have a mutation in the ABCB-1 gene, rendering them deficient in their ability to limit drug absorption and distribution. These dogs also have delayed excretion of drugs that are normally transported by P-glycoprotein, making them susceptible to severe drug toxicity. In these dogs, significant dose reductions must be calculated prior to administration in order to avoid toxicity or the drug must be avoided completely and it is considered standard of care to document the presence of an ABCB-1 mutation in an at risk breed prior to treatment with a drug that is known to be problematic.
Sedation with xylazine-butorphanol or romifidine-butorphanol continuous intravenous infusions during standing laparoscopic ovariectomy in donkeys.	Dzikiti, T. B. Maney, J. Escobar, A.	tdzikiti@rossvet.edu.kn	0	2	With regards to anesthesia techniques, donkeys are commonly wrongfully assumed to be small horses, but the reality is that they have different pharmacokinetic and pharmacodynamics drug profiles. The outcomes of the proposed study will provide vital information on long-term sedation of donkeys.
The comparison of grapiprant (Galliprant®) and carprofen in managing chronic pain associated with canine osteoarthritis	Silkworth, A. Peda, A. Karnik, P. Dzikiti, B.	asilkworth@rossvet.edu.kn	2	0	Grapiprant (Galliprant®) will be superior to carprofen in managing pain associated with canine osteoarthritis in geriatric patients and will be associated with less clinical side effects than carprofen. The aim of this study is to establish a first of its kind, head to head comparison between a cyclooxygenase (COX) inhibitor and a prostaglandin receptor antagonist (PRA) in controlling pain in the canine patient clinically affected by osteoarthritis (OA) by i) evaluating pain response using the validated Canine Brief Pain Inventory (CBPI) and veterinary assessment (Dr. Priti Karnik) at specified time points, and ii) comparing any potential clinical side effects of a COX inhibitor and a PRA using clinical evaluation and blood work analysis.
Synthetic cathinones (Bath Salts)-induced psychosis	Shokry, I. Callanan, S. Tao, R.	ishokry@rossvet.edu.kn	0	0	Aim 1. Characterize astrochemistry of KYNA in response to psychostimulants. We anticipate that KYNA secretion from astrocytes is ascribed to not only glutamatergic receptor mechanisms but an also direct effect of MDPV. The effect on KYNA caused by cocaine and METH is weak compared to MDPV. We predict that the secretion of KYNA will be increased in the FCx, but not the striatum. Aim 2. Define the relationship between KYNA secretion and ExD intensification. We will pharmacologically manipulate capability of KYNA secretion in the brain while the ExD intensity will be behaviorally determined in response to MDPV, cocaine and METH. Based on our preliminary data, we predict that drug-induced elevation of KYNA secretion with the KYNA precursor will exacerbate the severity of ExD caused by cocaine or METH while inhibition of KYNA secretion with KAT-2 enzyme inhibitors will alleviate the effect of MDPV on ExD intensity.
Reducing animal use in ecotoxicology: establishing freely available normal references and historical controls for the gonadal development of wood frog larvae, a study species in ecotoxicology	Fenton, H. Forzan, M. J.	hfenton@rossvet.edu.kn	1	0	By establishing a histological atlas of the normal development of the gonads in wood frogs, we will provide a baseline reference of “historical controls” and tissue appearance for future use of wood frogs as sentinels for human and animal disease that will help reduce the number of tadpoles needed for future studies. Wood frogs are a good model species for experimental infections and studies designed for the development of regulations on the safe use of pesticides, because of their small size and adaptations to a variety of environments.



CENTER 2: CENTER FOR INTEGRATIVE MAMMALIAN RESEARCH *(Continued)*

Project Title	PI(S)	Contact	# RAs	# RVs	Project Description
Epidemiology of gastrointestinal parasites in indigenous and crossbreed goats in St Kitts-towards establishing a deworming programme for goats	Cameron-Blake, N. Mukaratirwa, S. Chapwanya, A.	ncameronblake@rossvet.edu.kn	2	2	St Kitts and Nevis have recently embarked on a goat breeding initiative which involves the improving of the current indigenous breed by crossing it with an exotic breed to maximize production. It is anticipated that this initiative will produce an improved hybrid with growth and disease resistant traits superior to the indigenous breed. Among the major causes of mortality and poor growth in goats in St Kitts are gastrointestinal (GIT) parasites. Hence, the aim of this study is to determine the seasonal occurrence of GIT parasite species in indigenous and hybrid goats kept on an extensive rearing system, and their effects on health and growth of the animals. The study will allow identification of parasite species of goats of economic importance, their seasonal occurrence/trends in both indigenous and hybrid goats as well as assessing if there are any breed-difference in various production and health traits due to the GIT parasite infection. The information generated from the study will also be used in designing an effective deworming programme for goats in St Kitts and Nevis.
Generation of a bovine monocyte-derived macrophage cell line for functional studies of bovine TRIM proteins	Toka, F. Szulc-Dabrowska, L. Chapwanya, A.	ftoka@rossvet.edu.kn	1	TBD	There is no reliable bovine macrophage cell line for studies of gene function and regulation. The proposed work intends to develop such a cell line using bTERT transfection of a nine-day old culture of monocyte-derived macrophages. The cell line, once developed, will be used to investigate expression and function of bovine TRIM genes and proteins, respectively, following infection with bacteria, so as to understand how these innate immune proteins can be harnessed to improve animal health.
Endometrial inflammatory response and fertility of jennies after insemination with donkey jack cryopreserved semen	Ibrahim, M. French, H. Gilbert, R.		2	>30	The current project seeks to develop breeding management strategies to modulate post-breeding inflammatory response in jennies, with the ultimate goal of improving pregnancy rates of donkey cryopreserved semen. The results of this proposal will advance the field of donkey reproduction, and the knowledge generated herein can be directly applied to optimize the breeding management of domestic donkeys and to conservation programs of endangered wild species of equids.
Influence of vaccination on fecal parvovirus antigen test results in healthy dogs	Bouillon, J. Ghosh, S. Toka, F. Peda, A. Mukaratirwa, S.	jbouillon@rossvet.edu.kn	3	2	The findings of this project will advise clinicians in the use of point of care test for the diagnosis of canine parvovirus infection in St Kitts and will provide clinicians with information regarding the degree of certainty they can have when interpreting a positive fecal antigen test result in a recently vaccinated puppy. Further information will be collected in regards to the parasites harbored by dogs in St Kitts. These results will expand the data available on these parasites in the Caribbean and will bring awareness to the clinicians in regards to the possibility of parasitic infections, especially zoonosis, in their canine patients.
Determination of the minimal time of centrifugation of microhematocrit tubes for measuring packed cell volume and total solids in horses, donkeys, cattle and sheep. Description of a stall-side method to obtain accurate values of packed cell volume and total solids in horses and donkeys.	Chapuis, R. Dowling, P. Tiago, A.	rchapuis@rossvet.edu.kn	2	5	Reporting an accurate minimal time of centrifugation of microhematocrit tubes to measure the PCV for large animal species is essential to gain in efficacy and/or improve the accuracy of patients' assessment, especially when managing emergency and/or critical cases. Equine field veterinarians need to sample the animal and spin the samples when back at the clinic; therefore, appropriate treatment/management/referral decisions might be delayed for some cases. Being able to accurately determine PCV-TS in the field will be a very valuable tool for equine practitioners.

CENTER 3: CENTER FOR CONSERVATION MEDICINE AND ECOSYSTEM HEALTH

Project Title	PI(S)	Contact	# RAs	# RVs	Project Description
Range, distribution and abundance of white-tailed deer on St. Kitts.	Knobel, D. Keehner, J. Ghosh, S.	dknobel@rossvet.edu.kn	0	0	Population growth of feral donkeys on Nevis has created an ongoing conflict with farmers, livestock producers, hospitality providers and residents. The Nevis donkey project will develop a repeatable, cost effective way to estimate the abundance of feral donkeys on Nevis. An accurate estimation of abundance over time will inform decision makers of the effectiveness of population control efforts.



CENTER 3: CENTER FOR CONSERVATION MEDICINE AND ECOSYSTEM HEALTH *(Continued)*

Project Title	PI(S)	Contact	# RAs	# RVs	Project Description
Impact of Enrichment Interventions on Stress Parameters in Wild Caught African Green Monkeys (<i>Chlorocebus aethiops sabaeus</i>).	Vieira, A. Beierschmitt, A. Gallagher, C.	avieira@rossvet.edu.kn	1	1	Macaques have been the most popular primate for biomedical research and as such most research on enrichment and well-being focuses on them. Today, the African Green Monkey (AGM) is becoming more popular in biomedical research and generalizations are being made from macaques to guide protocols on the well-being of AGMs. If this application is funded, this project will investigate how exact enrichment measures affect the AGM well-being to allow for refinement on protocols for the use of this species in biomedical research internationally.
Merging Conservation Efforts with Public Health: Assessing the Biodiversity, Ecological Services and Seroprevalence of Rabies Virus Neutralizing Antibodies in Bats on Saint Kitts	Hooper, S. Knobel, D.	shooper@rossu.edu	4	45	Bats serve as reservoir hosts for endemic and emerging viral zoonotic diseases including rabies and the novel coronavirus COVID-19 from Wuhan, China. Recently, transmission events of emerging bat viruses have been linked to physiological and environmental stress. This year-long project inventorying the bat population on Saint Kitts will lay the foundation for future studies which will focus on developing conservation strategies to improve ecosystem services while decreasing the risk of zoonotic disease transmission between bats and other animals.
Identifying the pathophysiological mechanisms through which the non-specific effects of rabies vaccine on survival in dogs are mediated	Knobel, D. Thrall, M. A. Crafford, J. E. Leisewitz, A.	dknobel@rossvet.edu.kn	0	0	Certain inactivated vaccines may have a substantial detrimental effect on female survival in high-mortality populations. In this study, we will attempt to identify the pathophysiological mechanisms through which the non-specific effects of rabies vaccine on survival in dogs are mediated. This knowledge will provide a foundation for actions to mitigate any detrimental effects of inactivated vaccines on female survival while maintaining the specific beneficial effect of these vaccines against target pathogens.
Testing the immunocontraceptive efficacy and safety of ZP3-RN in mice	Knobel, D. Bertschinger, H. J. Roth, R.	dknobel@rossvet.edu.kn	0	0	Injectable immunocontraceptive vaccines against reproductively-important self-antigens such as zona pellucida 3 protein (ZP3) can offer a cost-effective solution for humane dog population management, if safe and effective formulations can be developed. Rabies virus nucleoprotein (RN) has been shown to enhance immune responses (antibody production or T-cell proliferation) to other antigens. We aim to test the efficacy and safety of a novel ZP3-RN fusion protein in mice which, if successful, will provide data to support an extramural application to trial the formulation in dogs.
Persistent organic pollutants (POP) in blubber of wild cetaceans in the Eastern Caribbean	Freeman, A. Bergfelt, D. Bolanos, A.	afreeman@rossvet.edu.kn	0	0	The results of our research will contribute to an expanding knowledge base on aquatic exposure and bioaccumulation and biomagnification of highly toxic and persistent organic pollutants (POPs) such as PCBs that may be affecting general and reproductive health of cetaceans in the Caribbean and, thus, provide a basis for future studies to explore and develop a conservation plan. Moreover, the concentrations of POPs in blubber will provide valuable public health information regarding the safety of whale meat for human consumption and, perhaps, contribute to a plan to reduce whaling on vulnerable populations of cetaceans in the Caribbean and elsewhere.

CENTER 4: CENTER FOR RESEARCH AND INNOVATION IN VETERINARY AND MEDICAL EDUCATION

Project Title	PI(S)	Contact	# RAs	# RVs	Project Description
The extended mindful reality (EMR) pilot project	Artemiou, E. Bradtko, J. Rainier, R. Deza-Cruz, I.	eartemiou@rossvet.edu.kn	1	2	The Extended Mindful Reality (EMR) Pilot Project will address the current lack of empirical data in the development and research surrounding Extended-Reality (XR)-assisted mindfulness tools, and can be introduced in academic and practice veterinary settings supporting mindfulness and contemplative-based practices thus improving resilience and wellbeing.
The Development of an eBook for Theriogenology Teaching	French, H.	hfrrench@rossvet.edu.kn			Technology is advancing rapidly and students' learning styles are changing with these advances. The use of iPads in the classroom has become commonplace in many institutions including Ross University School of Veterinary Medicine (RUSVM). The "Paw Pads" have been instituted as a required tool for students in the lower semesters and instructors are adjusting their teaching styles to enhance their lectures. The theriogenology instructors would like to implement the use of iPads in their course by creating an eBook that can be updated as needed and utilize this teaching tool in their curriculum.



CENTER 4: CENTER FOR RESEARCH AND INNOVATION IN VETERINARY AND MEDICAL EDUCATION (Continued)

Project Title	PI(S)	Contact	# RAs	# RVs	Project Description
Impact of training on competence and confidence in pregnancy diagnosis in cats using abdominal palpation and Focused abdominal ultrasound.	French, A. Bucknoff, M. French, H. Cavanaugh, S.	afrench@rossvet.edu.kn	1	2	Abdominal palpation is a very important part of the physical examination and forms an important first line test for pregnancy diagnosis in cats. Teaching of abdominal palpation in cats can be challenging due to temperament and in particular teaching of pregnancy diagnosis can be difficult due to limited numbers of pregnant queens to access readily for teaching. Hence the importance of developing models to support the teaching of this important clinical skill. The development of a low fidelity feline pregnancy diagnosis model will add to tools available to teach this important clinical skill. There is currently no known model. Ultrasound (US) is now cheaper and more commonly available in small animal practice with focused US playing a more important part in informing further diagnostic tests. This project aims to show that a short training using an iBook on focused ultrasound for pregnancy diagnosis in cats will significantly improve competence and confidence of pregnancy diagnosis in cats when combined with training in abdominal palpation using a low fidelity model.
Virtual Pathology Rounds	Bolfa, P. Kessel, A.	pbolfa@rossvet.edu.kn	3	4	Cases submitted to the Pathology services at RUSVM are being routinely archived (gross images, pathology reports, histology slides, clinical pathology data, ancillary testing etc.). Cases with high learning potential are assigned to Fourth semester student volunteers (4 to 6 per semester) enrolled in the Systemic Pathology course, who compile these cases into a presentation containing the most significant findings, high quality gross/histology/cytology images, pathology interpretation and a discussion that includes a literature search. Subsequently the document is reviewed by a faculty pathologist and submitted to the academic technology team for conversion into the Virtual Pathology Rounds (VPR) iBook format.
Face, construct and concurrent validity of an equid castration model	Nolazco Sassot, L. Artemiou, E. Little, E. Peterson, E. Conan, A.	nolazco@rossvet.edu.kn	4 - 8	4	In equids, castration is the most commonly performed surgical procedure. Complications associated with castration occur commonly and remain one of the most common causes of malpractice claims against equine veterinarians. Intra- and post-operative complications associated with castration in equids can be serious and even life threatening. In veterinary schools in North America, students typically perform castrations on client- or university-owned live animals as part of their training and community service. Although experience with animals is essential to prepare veterinary students, the ethical concern of operating on live animals without previous training in procedure-specific skills remains an important aspect. To maximize student learning experience and to decrease unnecessary surgical trauma to patients, students performing surgery must be familiar with how tissues feel before conducting any operation in live animals. To date, veterinary students in North America are taught basic surgical skills and one or more didactic lectures prior to castrating live equids. Direct transition from the classroom to operating on live equids not only increases patient morbidity but also represents a significantly stressful leap for veterinary students which may affect their learning capabilities. Valid inanimate models have been shown to be effective for training veterinary students in procedure-specific skills, resulting in improved learning outcomes and student performance while operating on live animals.
Student Stress	Little, E.	elittle@rossvet.edu.kn			The specific aim of this study is to evaluate cortisol levels in students performing the task of arthrocentesis on a model compared to the cortisol level when performing the task on a patient. Additionally, this study will evaluate the level of perceived stress that a student is experiencing while performing the task on a model and while performing the task on a patient. Students will be evaluated to see how long it takes to complete the task and the study will determine if prior practice on the model improves time when performing the task on a patient. The number of attempts required to complete the task successfully will be recorded for both the model and patient. We hypothesize that cortisol levels will be higher in students preparing to perform the task on a patient rather than on the model, and that the time and number of attempts required to successfully complete the task will be less in students afforded the opportunity to initially perform the task on the model prior to the patient.