

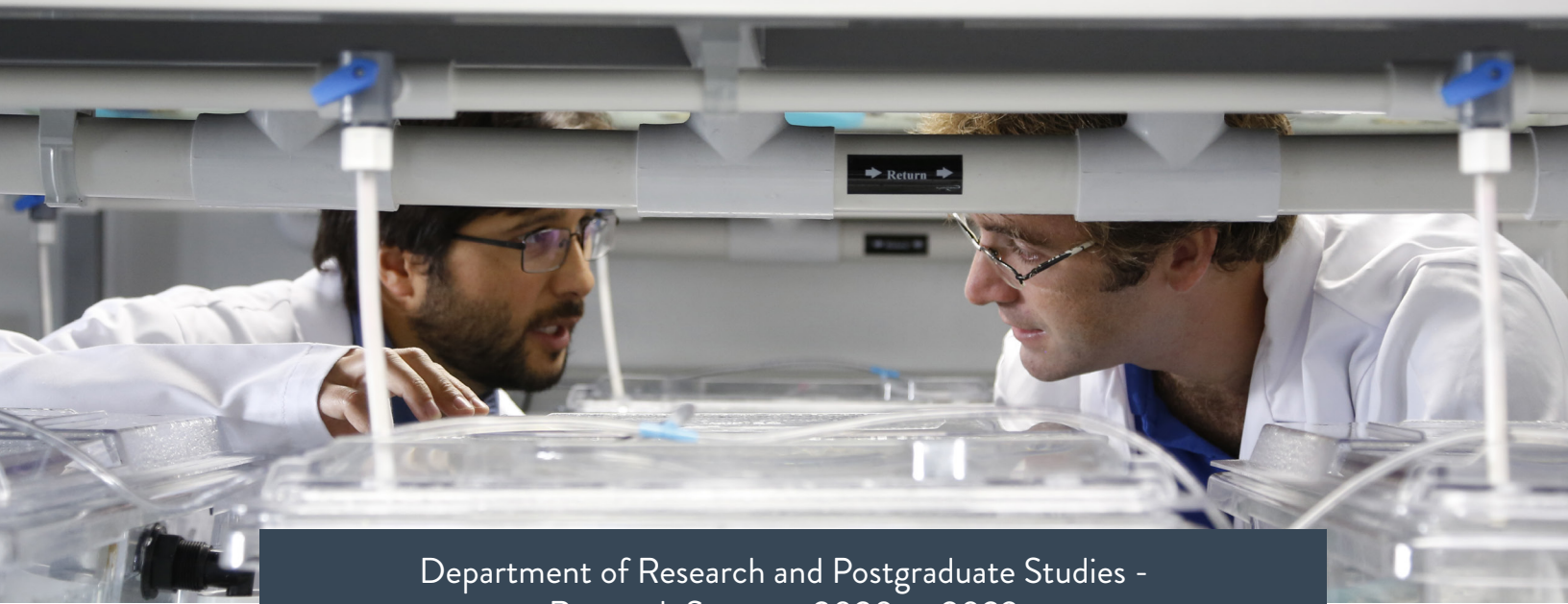


ROSS UNIVERSITY

SCHOOL OF VETERINARY MEDICINE

DEPARTMENT OF RESEARCH AND
POSTGRADUATE STUDIES

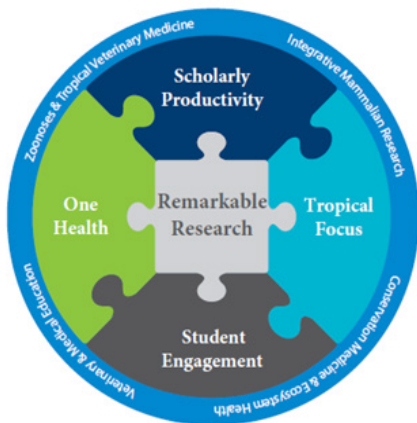
RESEARCH STRATEGY 2020 TO 2023



Department of Research and Postgraduate Studies - Research Strategy 2020 to 2023

EXECUTIVE SUMMARY

Remarkable research encompasses the integration of four core areas - Scholarly Productivity, Student Engagement, One Health, and Tropical Focus - that will elevate and distinguish RUSVM as unique among academic institutions in the Caribbean region with its functional capacity to conduct research that encompasses One Health – the integrative effort to attain optimal health for people, animals, and the environment. Fostering and strengthening our research capacity and initiatives requires that our faculty are fully supported with opportunities to be current within their respective disciplines and provided an infrastructure and resources to conduct and publish quality research. Consequently, our students are enriched with opportunities to enhance and broaden their learning experience through engagement with research-active faculty, which can be inspirational leading students to embrace and integrate science-based medicine for a successful career in the veterinary profession. Aligning with our broader academic RUSVM strategic plans and goals, we have identified the four core areas of Scholarly Productivity, Student Engagement, Tropical Focus, and One Health that will guide the delivery of remarkable research across our research centers from 2020 to 2023.



VISION

Achieve regional and global recognition as an AVMA-accredited center of higher education through evidence-based science, innovation, and collaborative research in veterinary medicine and other health sciences, while embracing contemporary modes of learning through a One Health trans-disciplinary approach.

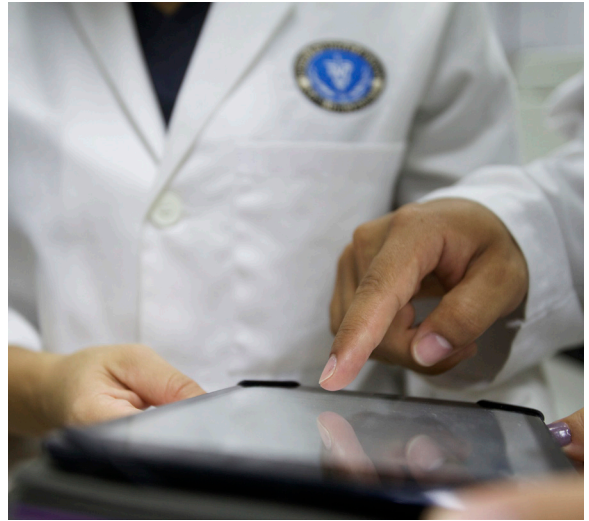
MISSION

Forge regional and global strategic partnerships to optimize and mobilize resources to increase levels of external recognition and funding to sustain research activities as measured by faculty scientific outputs, DVM student engagement, and the bestowment of postgraduate degrees.

CORE AREAS

Scholarly Productivity

A diverse faculty with a strong desire and passion to be research-active and supported by an infrastructure that meets the needs to conduct basic and applied experimentation and discovery is the foundation for achieving scholarly productivity. Recruitment and mentoring of veterinary and post-graduate students, publication of peer-reviewed journal articles, award of intra-and extramural grants, and the establishment of collaborative research initiatives locally, regionally, and globally are measurements of scholarly productivity. Over the next four years, we will ensure our faculty continue to excel in scholarly research activities by achieving major milestones:



- Recruit and retain research-active faculty as defined by at least one publication (primary or co-author) and an active internal or external grant or grant application (PI or Co-PI)
- Recruit and retain administrative and laboratory staff with a broad range of clerical and technical skills who can fully support the various disciplines of research-active faculty and diversity of projects
- Increase the annual output of publication of peer-reviewed scientific articles in high impact journals
- Increase the annual output of abstracts for oral and poster presentations at scientific meetings
- Increase the annual output of external grant submissions
- Organize workshops to strengthen skills in hypothesis testing, experimental design, data analyses, preparation of manuscripts and grant proposals, and oral and poster presentations.

Student Engagement



To align with the mission of RUSVM to provide the best possible learning environment for our students to become leaders in the veterinary profession while advancing animal and human care, and well-being that fully encompasses the concept of One Health, a fundamental understanding of the scientific method and research is imperative toward achieving that goal. Our students are offered multiple opportunities to experience research with our faculty in the classroom, laboratory, and out in the field as research associates, research volunteers, and post-graduate MSc students. Over the next four years, we will continue to promote and inspire our students to engage with faculty to enhance and broaden their learning experience through research by achieving major milestones:

Student Engagement - continued

- Increase the annual number of veterinary students engaged in research with more students as research volunteers than research assistants
- Increase the annual number of veterinary students engaged in a combined DVM-MSc degree
- Increase the annual number of veterinary students engaged or included as authors on peer-reviewed scientific publications, abstracts, and grant applications
- Increase the annual number of veterinary students engaged in oral and poster presentations during RUSVM Research Day
- Develop a veterinary student elective on advanced research and diagnostic techniques

One Health



Each of the RUSVM research centers embraces the concept of One Health such that the focus of research is to encompass animal, human, and environmental health and conservation. The One Health concept is supported institutionally with research-active faculty involved in One Health-related research projects, an online MSc One Health Program, and a One Health Research Foundation. Over the next four years, we will continue to develop and promote One Health to enhance educational and research opportunities by achieving major milestones:

- Continue to market and develop the MSc and Certificate in One Health programs to enhance recruitment and increase the annual number of post-graduate students
- Expand educational opportunities by creating One Health modules for veterinary student electives and continuing education credits for DVM graduates
- Leverage the One Health Research Foundation within RUSVM and across Adtalem's regional medical schools to secure external funding that supports collaborative faculty-led research



Tropical Focus

RUSVM's geographical location in the Eastern Caribbean on the island of St Kitts is a unique environment to foster collaborative research working with companion (dogs, cats)

and domestic production animals (sheep, goats, pigs, cattle, chickens) living under tropical conditions as well as a large diversity of wild terrestrial (donkeys, deer, monkeys, bats, mongoose) and aquatic (sea turtles, dolphins, finfish, lobster, coral) species. The broad base of animals for study, combined with the expertise of our faculty across multiple disciplines, provides enormous potential to attract and establish international partnerships and external funding to support scholarly productivity. Over the next four years, we will cultivate existing and new partnerships with local, regional, and international institutions, organizations, and societies involved in animal and human health and conservation by achieving major milestones:

- Review strategic needs and outputs, and renew as necessary existing partnerships with local and regional government and non-government institutions and organizations involved in animal, human, and environmental health
- Seek and propose new relevant partnerships to support strategic needs with international organizations to increase annual research outputs
- Foster collaboration with Adtalem medical schools to support common regional initiatives in animal and human health
- Host annual regional and international scientific meetings encompassing One Health to promote and showcase RUSVM's research capacity





Research Centers

RUSVM is regionally recognized and respected for our strength in research and scholarly impact through our four Research Centers: One Health Center for Zoonoses and Tropical Veterinary Medicine, Center for Integrative Mammalian Research, Center for Conservation Medicine and Ecosystem Health, and Center for Veterinary and Medical Educational Research. The success of our overall research program's strategic outputs will be assessed annually based on deliverables centered around our core areas aimed at fostering continued faculty and staff engagement, maintaining research outputs, enhancing the DVM student experience, cultivating partnerships and community engagement. The Associate Dean of Research & Postgraduate Studies and each Center Director will be responsible for creating and implementing a tactical plan that outlines the steps necessary to achieve the strategic objectives in accord with our vision and mission.

The implementation plans of the individual Research Centers coalesce to create an integrated One Health research program. Implementation plans are guided by achieving overall goals set for the RUSVM research program aligned with AVMA and other accreditation requirements which include:

- Publish at least 100 papers in peer-reviewed international, scientific journals each year
- Have 50% or more of RUSVM faculty classified as research-active with at least one publication as primary or co-author, and an active internal or external grant or grant application as PI or Co-PI
- Engage at least 125 DVM students in research per semester
- Maintain ratio (>2:1) of unpaid research volunteers to paid research assistants per semester
- Have 15 or more DVM students included as co-authors on RUSVM peer-reviewed papers each year
- Increase the number of new enrolling DVM-MSc dual degree students by 20% annually
- Recruit and enroll a minimum of 10 MSc/Certificate One Health students annually
- Maintain at least 25 student posters and 10 three-minute student talks on Research Day annually
- Increase extramural research funding by 25% annually by leveraging research partnerships and the One Health Research Foundation

Each semester the Center Directors will host a meeting with their respective center members and the Associate Dean for Research and Postgraduate Studies to review the status of center implementation plans and provide guidance and strategy for fulfilling annual research objectives and goals, respectively. Semi-annual meetings of the Associate Dean for Research and Postgraduate Studies, Center Directors, and Department Heads will be held to review individual faculty research metrics for performance assessment to ensure accountability at all levels.

RESEARCH CENTER IMPLEMENTATION PLANS

Center 1 - One Health Center for Zoonoses and Tropical Veterinary Medicine

The One Health Center for Zoonoses and Tropical Veterinary Medicine focuses on research aimed at understanding and combatting zoonotic, vector-borne, and other tropical infectious diseases affecting animal and human health as well as priority livestock and fish production around the Caribbean and Central America. Faculty experts working on various aspects of infectious diseases (bacteriology, virology, parasitology, epidemiology, molecular biology and serology, microbial ecology, pathology, and pathogen drug resistance), food safety and security and tropical veterinary medicine utilize a variety of laboratory- and field-based research methods to investigate local, regional and/or international issues and critical research gaps relevant to the Center focus areas. Center members collaborate with various local (Ministries of Health, Agriculture and Environment, St. Kitts and Nevis), regional (Caribbean Animal Health Network (CaribVET) and Caribbean Public Health Agency (CARPHA) and international stakeholders (the Food and Agriculture Organization (FAO) and World Health Organization (WHO) of the United Nations; World Organization for Animal Health (OIE)), and engage DVM, postgraduate students and/or Postdoctoral Fellows to achieve their research goals.

Focus Areas



- Zoonotic, vector-borne and tropical infectious diseases
- Antimicrobial and anthelmintic resistance
- Food and feed safety and security
- Health management of priority livestock and fish

Strategic Objectives

1. Strengthen and expand one-health research on infectious diseases as well as priority live stock and fish production, especially in the Caribbean region by:

- Publishing at least 40 research papers in peer-reviewed journals per year
- Submitting at least 4 grant applications for extramural funding per year

Strategic Objectives - continued

- Utilizing the intramural funding program to support projects on key Center-1 research topics relevant to the region and prioritized by extramural funding agencies
- Forging new and strengthening existing collaborations with local, regional, and international stakeholders with interests in infectious diseases and tropical veterinary medicine
- Supporting off-campus training of at least 1-2 faculty/students on the application of the latest technology to infectious disease research per year
- Promoting Center-1 research outcomes to a wider audience by creating public awareness on infectious diseases, especially zoonosis and health management of livestock and marine life

2. Increase student involvement in one-health research at RUSVM by:

- Enrolling at least 50 DVM students as research assistants/volunteers (RA/RV) per year
- Attracting 3-4 MSc and Ph.D. students to Center-1 research projects
- Hosting 2-3 research interns from other institutes per year
- Supporting at least 1-2 students to present data (oral/poster) at international conference(s) per year

Milestones: 2020

- Publish at least 40 papers in peer-reviewed research journals
- Submit a minimum of 4 extramural grants
- Enroll at least 50 DVM students (RA/RV) to Center-1 research projects
- Focus on attracting 3-4 postgraduate students to Center-1 research projects
- Support training/conference presentation of 2 faculty/students
- Host 2 research interns from other institutes
- Create public awareness on Center-1 research outcomes
- Forge research collaborations with external research organizations, such as ARCAS Guatemala, resulting in multiple research publications and grant applications within 2-3 years.
- Promote Center-1 research to a wider audience by working closely with the Adtalem and RUSVM marketing and communication teams
- Secure extramural funding for 2 postgraduate students

Milestones: 2021

- Publish at least 40 papers in peer-reviewed research journals
- Submit a minimum of 4 extramural grants
- Enroll at least 50 DVM students (RA/RV) to Center-1 research projects
- Focus on attracting 3-4 postgraduate students to Center-1 research projects
- Secure extramural funding for 2 postgraduate students
- Support training/conference presentation of 2 faculty/students
- Host 2 research interns from other institutes
- Promote Center-1 research outcomes through media outreach

Milestones: 2022

- Publish at least 40 papers in peer-reviewed research journals
- Submit a minimum of 4 extramural grants
- Enroll at least 50 DVM students (RA/RV) to Center-1 research projects
- Focus on attracting 3-4 postgraduate students to Center-1 research projects
- Secure extramural funding for 2 postgraduate students
- Support training/conference presentation of 2 faculty/students
- Host 2 research interns from other institutes

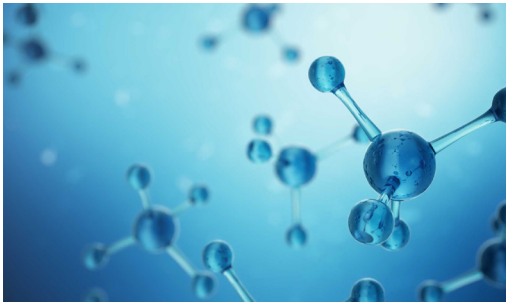
Milestones: 2023

- Publish at least 40 papers in peer-reviewed research journals
- Submit a minimum of 5 extramural grants
- Enroll at least 50 DVM students (RA/RV) to Center-1 research projects
- Focus on attracting 3-4 postgraduate students to Center-1 projects
- Secure extramural funding for 2 postgraduate students
- Support training/conference presentations of 2 faculty/students
- Host 2 research interns from other institutes

Center 2 - Integrative Mammalian Research

Center for Integrative Mammalian Research focuses on understanding cellular and molecular mechanisms underlying the function of body systems during health and disease, including animal models of human diseases. Study areas encompass the main biomedical sciences such as physiology, immunology, pathology, pharmacology, and toxicology. There is a substantial representation of research in animal reproduction, clinical pharmacology, comparative immunology, and anesthesiology, owing to the unique availability of feral donkeys and African green monkeys in the Federation of St. Kitts and Nevis. Center 2 uses a One Health approach to research, connecting human, animal, and environmental aspects while efficiently utilizing the faculty expertise as well as strategic alliances with partners such as the Caribbean Animal Health Network (CaribVET), Caribbean Public Health Agency (CARPHA) and international stakeholders (FAO, WHO, OIE and locally with RxGEN).

Focus Areas



- Animal Models for Human Diseases
- Animal Reproduction and Genetic Disorders
- Animal Physiology/Pharmacology/Toxicology
- Comparative Immunology

Strategic Objectives

1. **Increase extramural funding by 4-6 grant applications per year**
2. **Increase intake of master's degree students and participation of DVM (Research Volunteers and Research Assistants) students in Center 2 research projects**
3. **Preferentially support Center 2-based intramural projects in the less represented but important study area of pathology, as well as encourage collaborative intramural research projects in Center 2 that capitalize on the uniquely available animal species and the local environment**

Milestones: 2020

- Publish at least 35 papers in peer-reviewed research journals
- Submit at least 4 extramural grants
- Involve at least 32 DVM students in research
- Secure extramural funding for 2 postgraduate students

- Market reproductive research expertise and measure success by involvement in extramural submissions and development of strategic alliances

Milestones: 2021

- Publish at least 35 papers in peer-reviewed research journals
- Submit at least 4 extramural grants
- Involve at least 32 DVM students in research
- Secure extramural funding for 2 postgraduate students

Milestones: 2022

- Publish at least 35 papers in peer-reviewed research journals
- Submit at least 4 extramural grants
- Involve at least 32 DVM students in research
- Secure extramural funding for 3 postgraduate students

Milestones: 2023

- Publish at least 35 papers in peer-reviewed research journals
- Submit at least 4 extramural grants
- Involve at least 32 students in research
- Secure extramural funding for 3 postgraduate students



Center 3 – Conservation Medicine & Ecosystem Health

Center for Conservation Medicine and Ecosystem Health focuses on applied research into the health and management of wildlife and free-roaming animals in the tropics, with a special focus on marine species and terrestrial species that are not native to the Caribbean. Among marine species, the Center has a current focus on sea turtles, whales and dolphins, fish, corals and other aquatic invertebrates. In terrestrial ecosystems, the focus is on feral donkeys, free-roaming dogs, African green monkeys, and small Indian mongooses. Faculty members within the Center also provide additional training opportunities to DVM students through special electives in aquatic veterinary medicine, leveraging RUSVM's unique geographic position to provide students with hands-on experience in this growing field. To achieve its objectives, the Center works closely with local and regional partners, including the St. Kitts Sea Turtle Monitoring Network (SKSTMN), the St. Kitts and Nevis Departments of the Environment and Marine Resources, the Association of Marine Laboratories of the Caribbean, the Caribaea Initiative, the Wider Caribbean Sea Turtle Conservation Network, and Dolphin Discovery.

Focus Areas



- Health of species in Caribbean marine ecosystems
- Population ecology, disease epidemiology, and management of non-native island species

Strategic Objectives

1. Support established researchers in the Center to source external research funding while using internal resources to support the development of early-career researchers in the Center
2. Enhance the quality and impact of the research outputs from the Center
3. Maintain involvement and interest of DVM and postgraduate students in the Center's research
4. Foster regional and international partnerships to help the Center achieve these key strategic objectives
5. Conduct a scoping review and act accordingly on the potential establishment of a unique Sea Turtle Hospital and Rehabilitation Center on St. Kitts to serve as a sea turtle first response/triage and rehabilitation center for the wider Caribbean

- The Sea Turtle Center would be recognized as a formal sea turtle treatment location as well as a training location for veterinarians seeking to specialize in sea turtle medicine
- Patients could serve as diagnostics and treatment teaching cases for RUSVM students as well as student externs from other universities, creating new collaborative opportunities
- Provision of holding areas and treatment facilities could provide previously unavailable opportunities for regional collaboration on marine turtle health research

Milestones: 2020

- Publish at least 20 papers in peer-reviewed research journals
- Submit at least 3 extramural grants with \geq \$25,000 in funding to RUSVM
- Involve at least 50 DVM students in research
- Initiate assessment on construction and financing of Sea Turtle Hospital and Rehabilitation Center including the role of RUSVM in its governance

Milestones: 2021

- Publish at least 20 papers in peer-reviewed research journals
- Submit at least 4 extramural grants with \geq \$25,000 in funding to RUSVM
- Involve at least 50 DVM students in research
- Complete assessment on the establishment of a Sea Turtle Hospital and Rehabilitation Center including the role of RUSVM in its governance

Milestones: 2022

- Publish at least 25 papers in peer-reviewed research journals
- Submit at least 4 extramural grants with \geq \$50,000 in funding to RUSVM
- Involve at least 50 DVM students in research
- Initiate construction of Sea Turtle Hospital and Rehabilitation Center if deemed feasible

Milestones: 2023

- Publish at least 25 papers in peer-reviewed research journals
- Submit at least 4 extramural grants with \geq \$50,000 in funding to RUSVM
- Involve at least 50 DVM students in research
- Complete construction of Sea Turtle Hospital and Rehabilitation Center, if initiated

Center 4 - Innovation and Research in Veterinary and Medical Education

Center for Veterinary and Medical Educational Research aims to enhance scholarly teaching by focusing on specific research programs in innovative, interactive teaching technologies and strategies including communication, simulation, mobile gaming, and emerging technologies in virtual reality, machine learning and artificial intelligence, faculty development, and student learning outcomes. The researchers at this Center develop and evaluate innovative pedagogical tools and techniques, including new approaches to curricula which more effectively facilitate the application of acquired basic science knowledge to clinical professional training. The rolling semester system of RUSVM lends itself well to studies that enhance education, as pedagogical tools can be introduced, evaluated, and modified rapidly as semesters are repeated 3 times per year.

Focus Areas



- Student-centered teaching and learning approaches
- Simulations and emerging technologies
- Human-animal interactions and wellness
- Disaster research

Strategic Objectives

1. Enhance the use of current and emerging technology as well as simulations in teaching and learning, along with maintaining Apple Distinguished School Certification

- Continue Apple Distinguished Certification by demonstrating RUSVM's continuous engagement and improvement in using technology to support teaching and learning for re-certification in 2022
- Develop one custom-made iPad application on canine and equine cardiology in 2020
- Identify and develop one virtual technology and/or machine learning application in 2020-2023

2. Continue to identify and build mutually beneficial collaborations across Adtalem institutions, specifically RUSM, AUC, and Chamberlain, as well as other veterinary colleges/universities

- Collaborate with RUSM on the delivery of faculty educational certification programs in 2020-2021
- Collaborate with AUC on disaster management research surrounding the human-animal-bond, 2020-2023
- Collaborate with Chamberlain on the use of virtual reality in medical education in 2020-2023
- Create opportunities for collaboration with the University of Calgary/and other Universities on recruiting a Ph.D. student, 2020-2023

3. Support and enhance the continuation of small intramural grants, such that research and publication outputs are maintained while satisfying required pilot data to apply for extramural funding as well as continue to engage veterinary students in research. The continuation of funding small projects will also engage research-active faculty in presenting and showcasing outputs internationally

- Maintain the current research outputs and participation of student volunteers/assistants

4. Develop and support faculty coaching programs on research methodologies, as well as educational certifications, including simulation degree certification

5. Explore and aid in multi-institutional collaborations for the submission of extramural grants

- Develop and submit a minimum of 2 multi-institutional extramural submissions per year

6. Support and enhance programs and research surrounding human wellbeing, promoting

- Initiate a pet-therapy program for the St. Kitts community in 2020-2023
- Support research activities relating to wellness for RUSVM and the St. Kitts community in 2020-2023

7. Support the development of the RUSVM Disaster Research Working Group (DRWG)

- Develop a unique research program for the Caribbean and USA regarding veterinary engagement in disaster preparedness and response (pre, during and post disasters) focusing on zoonotic diseases, animal welfare, and animal bond
- Support research objectives surrounding animal health and safety in disaster preparation, improvement in disaster preparation, response, and recovery, as well as community-driven disaster risk reduction
- Attract future collaborators/partners and experts in the field through regional/international networking

Milestones: 2020

- Publish at least 6 papers in peer-reviewed research
- Submit at least 2 extramural grants
- Involve 100 students as research participants and engage 10 students as research assistants/volunteers
- Collaborate with 1 RUSM (colleague/team) on education programs and certifications
- Complete one custom made application - Heart Sounds
- Secure affiliate membership in the World Association for Disaster and Emergency Medicine (WADEM)

Milestones: 2021

- Publish at least 8 papers in peer-reviewed research
- Submit at least 2 extramural grants
- Involve 100 students as research participants and engage 10 students as research assistants/volunteers
- Collaborate with 1 RUSM (colleague/team) on education programs and certifications
- Build international collaboration to recruit one Ph.D. student, funded through an extramural grant

Milestones: 2021

- Publish at least 8 papers in peer-reviewed research
- Submit at least 2 extramural grants
- Involve 100 students as research participants and engage 10 students as research assistants/volunteers
- Collaborate with 1 RUSM (colleague/team) on education programs and certifications
- Build international collaboration to recruit one Ph.D. student, funded through an extramural grant

Milestones: 2022

- Publish at least 10 papers in peer-reviewed research
- Submit at least 2 extramural grants
- Involve 100 students as research participants and engage 10 students as research assistants/volunteers
- Collaborate with 2 RUSM faculty members on education programs and certifications

Milestones: 2023

- Publish at least 10 papers in peer-reviewed research
- Submit at least 2 extramural grants
- Involve 100 students as research participants and engage 10 students as research assistants/volunteers
- Collaborate with 5 RUSM faculty members on education programs and certifications