OFFICE OF RESEARCH and GRADUATE STUDIES

ANNUAL REPORT

FY20

Virginia-Maryland College of Veterinary Medicine

OFFICE OF RESEARCH AND GRADUATE STUDIES

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MESSAGE FROM

ASSOCIATE DEAN OF RESEARCH AND GRADUATE STUDIES

DR. ANSAR AHMED

I am pleased to present the 2020 Annual Research report of the Virginia-Maryland College of Veterinary Medicine (VMCVM). This report underscores and recognizes the outstanding achievements of our faculty, graduate students, and research staff. The research conducted in the college encompasses from basic biomedical sciences to translational medicine to public health, with an overall goal of improving animal and human health. The college's research program focuses on the following five major research areas of emphasis (not in the order of priority). These include:

- Pathogenic Microbiology (Infectious Diseases).
- Immune-mediated/Inflammatory Diseases.
- Population Health Sciences.
- Neuropathobiology.
- Comparative, Translational, & Veterinary Research

To support research programs, we have unique, specialized support facilities. These include the BSL-3 Infectious Diseases unit (IDU), gnotobiotic pig and mouse facility, Good Laboratory Practice Lab, and several service centers (Flow cytometry, Analytical Chemistry Research laboratory, Study Design and Statistics, Electron Microscopy, and Sterilization and Laboratory Support Services).

Increased Research Productivity Metrics

I take this opportunity to sincerely thank our research personnel (faculty, staff, and graduate students) who persevered and adapted to the challenges of working in a pandemic environment. This past year's noteworthy research achievement is that our extramural research awards increased by 41% and research expenditures increased 29%. These increases in research metrics are notable despite the challenges associated with the pandemic. It is very gratifying to note the increase in our research productivity trajectory over the last several years, as measured by extramural funding, publications, and presentations, and invited participation at the State and national levels. With the recruitment of new research-oriented faculty, we are optimistic that this positive trend will continue. Congratulations to our college's research personnel who have made this positive "mile-marker" possible. Our faculty have published their research findings in top-tier specialized journals. Many of our faculty have been recognized by national funding agencies, as evidenced by invitations to serve on grant review panels (such as NIH, USDA, and DoD study sections), scientific policy forums, and to speak at prominent venues.

Infrastructure Research Investments

To robustly grow our college's research program in infectious diseases, significant renovations were done. The research laboratories at the Center for One Health Research Building were renovated to accommodate a large research team of Dr. Seleem, a newly-recruited Endowed Chair in Bacteriology. Investments were also made to improve the equipment, administrative infrastructure/operations, and animal facilities of the Center for One Health Research and support for ACE2 murine models for COVID researchers. We also provided competitive short-term funds to support COVID-19-related research to generate preliminary data for the submission of extramural proposals rapidly. Our faculty submitted 73 COVID-19- related extramural proposals, and nine number of proposals were awarded.

Advancing veterinary clinical and comparative research will be one of the leading research goals. Major laboratory renovations were done in the main college building (Phase IVc) to create a Common Shared lab for clinical research. This newly created space (2,600 sq. ft. of wet lab) will allow clinical faculty interactions from the Biomedical Sciences (including anatomic and clinical pathologists, clinical microbiologists, parasitologists, etc.), Small Animal Clinical Sciences, and Large Animal Clinical Sciences departments. Our goals for the common clinical labs are to:

- Promote clinical research scholarship
- Promote Graduate/resident training
- Initiate and foster veterinary clinical collaborations among clinical-oriented faculty across departments
- Initiate and foster the development of extramural clinical grant proposals

It is incredibly gratifying to note that the number of grant proposals and awards from clinical faculty has significantly increased over the past two years. About 29% of the new grant announcements in 2020 were from clinical faculty. We anticipate that this new clinical research lab will further enhance our clinical research proposals. There is an adjoining space (400 sq. ft.) primarily for MPH and population health sciences to allow for additional interactions.

We continue to support researchers by funding annual Class II hood certifications, pipette calibrations, balance calibrations, purchase of critical pieces of equipment, service contracts for sensitive pieces of equipment, and workhorses such as freezers and incubators, among other laboratory needs.

Looking Ahead

It is now evident that the ongoing pandemic and potentially new emerging infectious and non-infectious diseases will require multiple strategies and varied expertise to counter these threats. To effectively tackle these disorders, a One Health Medicine approach is required to understand better the intersection of human, animal, and environmental health. The ongoing pandemic has made it vividly clear that to tackle infectious diseases, a multi-prong strategy is essential that will bring together diverse expertise in microbiology, immunology, public health, animal modeling, and epidemiology/predictive modeling, among others. Building interdisciplinary teams with relevant expertise from faculty across other colleges is pivotal for tackling infectious diseases, including emerging infectious diseases. To this end, our faculty are active participants of several university-wide related initiatives. These include the newly created Center for Zoonotic and Arthropod-borne Pathogens (CeZAP led by Dr. XJ Meng as a founding Director), Global Change Center, and Rural Health Initiative. To enhance collaborations and research programs, our faculty are strategically located in diverse research buildings outside the central vet school that include: Fralin Life Sciences Institute buildings at the Integrated Life Sciences Building (ILSB- the home of virologists), Life Sciences 1 (neuropathobiologists), Steger Hall (neuro-epigenetics and infectious disease modeling); and Fralin Biomedical Research Institute at VTC (neurobiologists); and Corporate Research Center (Vet bioinformatics). Our strengths continue to focus on a better understanding of diseases by using relevant animal models, providing early and accurate cutting-edge diagnosis, developing new and improved vaccines, and instituting preventive public health strategies.

in Public Health (MPH). Within the BMVS program, we have MS (regular and combined with residency) and Ph.D. in BMVS. Our program are flexible, serving all four departments. We have 26 students working on a traditional Ph.D. in biomedical sciences, 6 in our combined DVM/Ph.D. dual program, 8 Masters students, 25 Masters/ Residency students, and 4 in our Residency/Ph.D. combined program. We have graduated 8 MS and 3 Ph.D. students during 2020. We recently received a highly competitive NIH T32 grant (PI- XJ Meng and Co-PI- Ahmed) to train veterinarians in Ph.D. to fill the critical need for DVM scientists in academia, industry, and government. It is satisfying to note that our graduate students have been productive in publications. All of our graduate students after graduation have found employment, many in top-tier institutions.

I recognize that not all research achievements can be highlighted in this newsletter. We will endeavor to include research updates in future communications.

A special thanks to Dr. Jessica Crawford and Mrs. Andrea Green for collecting data for Research and Graduate programs, respectively. I am immensely grateful to Dr. Jessica Crawford for her invaluable contributions for this report.

DR. ANSAR AHMED

Associate Dean of Research and Graduate Studies

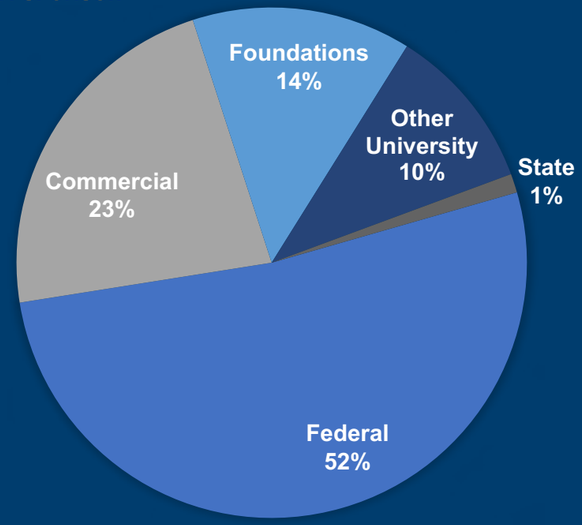
Virginia-Maryland College of Veterinary Medicine

RESEARCH PORTFOLIO AND METRICS

OVERVIEW OF FISCAL YEAR 2020

- ***Increased Extramural Grant Proposals Submitted:*** 223 proposals totaling $144.5 million submitted in FY20
- ***Increased Extramural Awards and Expenditures:*** Increase in awards ($12.3M, 41% increase) and research expenditures ($9.4M, 29% increase). Highest expenditures and award on record for a single fiscal year. About 29% of the new grant announcements in 2020 were from clinical faculty.
- VMCVM had a robust response to COVID-19. To date, faculty have been involved 73 proposal submissions and 9 awards related to COVID. Internal funds were also awarded to support research our the VT campus (page 14).
- ***New Research-focused Faculty:*** Critical new hires in our research-focused themes including bacteriology, parasitology, public health, and oncology, We also assisted in providing research support for new faculty hires that include equipment, graduate students, research space, and start up needs.
- ***New Research Faculty Orientation:*** We welcomed new faculty by presenting a new faculty orientation hosted by RGS and the Dean's Office. A recording of the presentation can be found here.
- ***New Training Grant for DVM Scientists:*** Renewal of our Animal Model Research for Veterinarian NIH T32 program. News Release
- ***Investments in Infrastructure and Research Support:*** Improvements of lab space and/or equipment that includes cutting-edge laboratories at Center for One Health Research (COHR), and a shared lab for clinical faculty to conduct collaborative clinical research, equipment support for the newly created, Animal Cancer Care Research Center (ACCRC), and IDU (page 19).
- ***Research Proposal Administrative Support:*** RGS continues to offer assistance with external grant and contract from pre to post-award management. We also provide and manage several internal seed grant programs. Opportunities to participate in training grants and assist in participation in other large-grant proposal initiatives across campus.
- ***New Research Blog:*** A research-based blog was created for the college. We encourage researchers to share their news of awards, grants, and publication (page 17).

EXTERNAL AWARDS BY SPONSOR



$12.3M

EXPENDITURES

29% increase over FY19

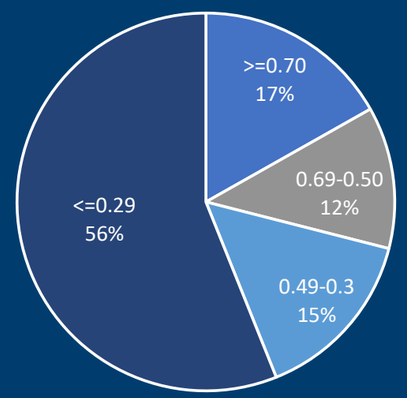
FY20 research expenditures $9.4 million

highest annual expenditures on record

36% increase in federal expenditures

RESEARCH FTE

34.88 Research FTEs



FACULTY SPOTLIGHT

Each issue we will highlight a different researcher from each of the research areas: Pathogenic Microbiology & Infectious Diseases, Immune-mediated & Inflammatory Diseases, Neuropathobiology, Population Health Sciences, and Comparative, Translational, & Veterinary Research.

PATHOGENIC MICROBIOLOGY & INFECTIOUS DISEASES

KYLENE KEHN-HALL, MS, PH.D.

Professor, Virology
Biomedical Sciences and Pathobiology

Research Program Overview: Research in my laboratory is centered on RNA viruses that cause acute infections. My group focuses primarily on encephalitic alphaviruses [Venezuelan equine encephalitis virus (VEEV), Eastern equine encephalitis virus (EEEV), and Western equine encephalitis virus (WEEV)] and Rift Valley fever virus (RVFV). Despite being recognized as emerging threats for human and veterinary health, relatively little is known about the virulence mechanisms of these viruses and there are currently no FDA licensed vaccines or therapeutics available. In addition, diagnostic assays are limited for these agents. Specifically, my laboratory is focused on 1) identifying critical host factors that are necessary for viral replication and/or pathogenesis, 2) evaluating small molecule inhibitors that target essential host-based events for their therapeutic potential, and 3) developing novel diagnostic tools to enable the early detection of viral infections. We use cell culture and mouse models of infection in combination with proteomic and transcriptomic analysis tools to identify pathways critical for viral replication. These same systems are used to test potential therapeutics and vaccines.

Given the rapidly evolving public health emergency caused by COVID-19, my group has pivoted to assist in efforts to study SARS-CoV-2. We are well positioned to contribute due to our experience working with BSL-3 pathogens and developing mouse models of infection. Our main projects on SARS-CoV-2 include: 1) evaluation of Nanotrap particles for enhanced COVID-19 diagnostics, 2) testing of drugs and small molecule compounds for their therapeutic potential, 3) characterization of signaling and innate immune response pathways activated by SARS-CoV-2, and 4) testing of materials for antiviral properties.

Research Productivity:

Recent Grants:

"Developing capsid-importin alpha inhibitors for the treatment of VEEV infection" NIH $690,583 Direct Costs 09/15/2020-08/30/2025 Role: MPI (Paige, Klimov, Kehn-Hall)

"Impact of Silicon Nitride on SARS-Cov-2" SINTX Technologies Corporation $69,689 – Direct Costs 08/10/2020-08/09/2021 Role: PI

"Long Non-Coding Ribonucleic Acids (lncRNA) Role in Pathogenesis" DTRA (University of New Mexico) $47,755– Direct Costs 9/21/2020 - 9/20/2023 Role: subcontract PI (PI: Bradute)

"EGR1 regulation of neuronal survival and inflammation following VEEV infection"DTRA $55,965 – Direct costs; ($1,020,755 – Direct costs pending for option years) 08/01/2018-07/30/2023 Role: PI

Recent publications:

Barrera, MD, Callahan V, Akhrymuk I, Bhalla N, Zhou W, Campbell C, Narayanan A, Kehn-Hall K. 2021. Proteomic Discovery of VEEV E2-Host Partner Interactions Identifies GRP78 Inhibitor HA15 as a Potential Therapeutic for Alphavirus Infections. Pathogens 10, no. 3: 283. https://doi.org/10.3390/pathogens10030283

He S, Waheed AA, Hetrick B, Dabbagh D, Akhrymuk IV, Kehn-Hall K, Freed EO, Wu Y. PSGL-1 inhibits the incorporation of SARS-CoV and SARS-CoV-2 spike glycoproteins into pseudovirions and impairs pseudovirus attachment and Infectivity. Viruses. 2020 Dec 30;13(1):46. doi: 10.3390/v13010046. PMID: 33396594.

Bracci N, Pan H, Lehman C, Kehn-Hall K, Lin S. 2020. Improved plaque assay for human coronaviruses 229E and OC43. PeerJ 8:e10639 https://doi.org/10.7717/peerj.10639

RA Barclay, I Akhrymuk, A Patnaik, V Callahan, C Lehman, P Andersen, R Barbero, S Barksdale, R Dunlap, D Goldfarb, T Jones-Roe, R Kelly, B Kim, S Miao, A Munns, D Munns, S Patel, E Porter, R Ramsey, S Sahoo, O Swahn, J Warsh, K Kehn-Hall, B Lepene. Hydrogel particles improve detection of SARS-CoV-2 RNA from multiple sample types. Sci Rep. 2020 Dec 30;10(1):22425. doi: 10.1038/s41598-020-78771-8. PMID: 33380736

Chowdhury AS, Reehl SM, Kehn-Hall K, Bishop B, Webb-Robertson BM. Better understanding and prediction of antiviral peptides through primary and secondary structure feature importance. Sci Rep. 2020 Nov 6;10(1):19260. doi: 10.1038/s41598-020-76161-8.

Lin SM, Lin SC, Hsu JN, Chang CK, Chien CM, Wang YS, Wu HY, Jeng US, Kehn-Hall K, Hou MH. Structure-Based Stabilization of Non-native Protein-Protein Interactions of Coronavirus Nucleocapsid Proteins in Antiviral Drug Design. J Med Chem. 2020 Mar 26;63(6):3131-3141. doi: 10.1021/acs.jmedchem.9b01913. Epub 2020 Mar 11.

Carey C, Akhrymuk I, Dahal B, Pinkham CL, Bracci N, Finstuen-Magro S, Lin SC, Lehman CW, Sokoloski KJ, Kehn-Hall K. Protein Kinase C subtype δ interacts with Venezuelan equine encephalitis virus capsid protein and regulates viral RNA binding through modulation of capsid phosphorylation. PLoS Pathog. 2020 Mar 9;16(3):e1008282. doi: 10.1371/journal.ppat.1008282. eCollection 2020 Mar.

Akhrymuk I, Lin SC, Sun M, Patnaik A, Lehman C, Altamura L, Minogue T, Lepene B, van Hoek ML, Kehn-Hall K. Magnetic NT Particles Preserve the Stability of Venezuelan Equine Encephalitis Virus in Blood for Laboratory Detection. Front Vet Sci, 6, 509 2020 Jan 28 eCollection 2019

Lin SC, Carey B, Callahan V, Lee JH, Bracci N, Patnaik A, Smith AK, Narayanan A, Lepene B, Kehn-Hall K. Use of Nanotrap particles for the capture and enrichment of Zika, chikungunya and dengue viruses in urine. PLoS One , 15 (1), e0227058 2020 Jan 7 eCollection 2020

Overview of mentor activities:

Currently serves as a mentor for 1 post-doctoral associate, 5 PhD students, 1 MS student, and 1 undergraduate student.

IMMUNE-MEDIATED & INFLAMMATORY DISEASES

XIN LUO, PH.D.

Associate Professor, Immunology
Biomedical Sciences & Pathobiology

Research Program Overview: My research interests are autoimmunity, host-microbe interactions, neonatal immunity, and nutritional immunology. There are 3 main directions of research in my laboratory. The first is to determine the role of gut microbiota in the pathogenesis of lupus. We have found that a leaky gut drives autoimmunity, and we are currently delineating the underlying mechanisms. The second direction is to reveal novel mechanisms of microbiota-mediated regulation of neonatal immune development, and how immunological imprints during the neonatal stage would impact the development of autoimmunity later in life. The third direction is focused on the role of vitamin A in the pathogenesis of lupus.

I am recognized nationally and internationally as the pioneer of microbiome research in the lupus research field. During my 9-year independent research career, I have published 40 peer-reviewed papers, 25 of which as the corresponding author. I am currently funded by NIH with an active R01 award. I also have a pending R21 scored under the payline. Moreover, I am an Associate Editor for the journal Microbiome (impact factor 11.6). Furthermore, I have so far served on 13 NIH study sections and 2 international review panels, and I have been nominated to become a standing member of an NIH study section.

Research Productivity:

Recent Grants:

(Only PI grants are shown.)

Current

NIH/NIAMS R01 Mechanistic Role of Probiotic Lactobacillus reuteri in Autoimmune Lupus
2/1/2018 – 1/31/2023

Pending (under payline)

NIH/NIAID R21 Leaky Gut Drives Autoimmunity via Bacterial Flagellin-Mediated Activation of TLR5
7/1/2021 – 6/30/2023
Impact Score: 24

Recent publications:

(Only recent last-author publications are shown.)

Mu Q, Swartwout BK, Edwards MR, Zhu J, Lee G, Eden K, Cabana-Puig X, McDaniel DK, Mao J, Abdelhamid L, Brock RM, Allen IC, Reilly CM, Luo XM (2021) Regulation of neonatal IgA production of the maternal microbiota. Proceedings of the National Academy of Sciences 118 (9): e2015691118.

Mu Q, Edwards MR, Swartwout BK, Cabana-Puig X, Mao J, Zhu J, Grieco J, Cecere TE, Prakash M, Reilly CM, Puglisi C, Bachali P, Grammer AC, Lipsky PE, Luo XM (2020) Gut microbiota and bacterial DNA suppress autoimmunity by stimulating regulatory B cells in a murine model of lupus. Frontiers in Immunology 11:593353.

Abdelhamid L, Cabana-Puig X, Mu Q, Moarefian M, Swartwout B, Eden K, Das P, Seguin RP, Xu L, Lowen S, Lavani M, Hrubec TC, Jones CN, Luo XM (2020) Quaternary ammonium compound disinfectants reduce lupus-associated splenomegaly by targeting neutrophil migration and T-cell fate. Frontiers in Immunology 11:575179.

Abdelhamid L, Cabana-Puig X, Swartwout B, Lee J, Li S, Sun S, Li Y, Ross AC, Cecere TE, LeRoith T, Werre SR, Wang H, Reilly CM, Luo XM (2020) Retinoic acid exerts disease stage-dependent effects on pristane-induced lupus. Frontiers in Immunology 11:408.

Mu Q, Cabana-Puig X, Mao J, Swartwout B, Abdelhamid L, Cecere TE, Wang H, Reilly CM, Luo XM (2019) Pregnancy and lactation interfere with the response of autoimmunity to modulation of gut microbiota. Microbiome 7(1):105.

Honors or recognitions:

2019 Outstanding Mentor Award
2020 Sigma Xi Full Membership
2021 Fulbright U.S. Scholar

Overview of mentor activities:

Trainee Awards

2020 NIH F31 Ruth L. Kirschstein National Research Service Award Individual Predoctoral Fellowship (Trainee: Brianna Swartwout)
2020 American Association of Immunologists (AAI) Travel for Techniques Award (Trainee: Brianna Swartwout)
2021 Nutrients Travel Award (Trainee: Leila Abdelhamid)
2021 CVM Outstanding Doctoral Student Award (Trainee: Leila Abdelhamid)

Current/Recent Trainees

Postdoctoral Fellows

Michael Edwards, D.V.M., Ph.D. (2019 – 2020)
Jing Zhu, Ph.D. (2020 – present)

Ph.D. Students

Brianna Swartwout, Ph.D. student (2016 – present)
Xavier Cabana-Puig, Ph.D. student (2017 – present)
Leila Abdelhamid, Ph.D. student (2018 – present)

M.D. Students

Grace Lee, M.D. student (2018 – 2020)
Meeta Prakash, M.D. student (2018 – 2020)
Noah Oakland, M.D. student (2021 – present)

Undergraduate Students/Visiting Students

Jiangdi Mao, Visiting graduate student (2019)
Erica Giles, Undegraduate student (2019 – 2020)
Anna Christovich, Undegraduate student (2020)
James Testerman, Undergraduate student (2020 – present)

NEUROPATHOBIOLOGY
MICHELLE THEUS, PH.D.

Associate Professor, Molecular and Cellular Neurobiology
Biomedical Sciences & Pathobiology
Co-Director, Translational Biology, Medicine, and Health Graduate Program

Research Program Overview:
The Laboratory of Neurotrauma research: Mechanisms of brain injury and repair.
Traumatic brain injury (TBI) is a major health burden resulting from car accidents, falls, sports injury and military service which can have wide-ranging physical and psychological effects. Our animal models of TBI in the lab are used to study the negative effects of trauma on the well-being of the brain and behavior. My team focuses on Eph receptor biology and function in the context of brain injury. Eph receptors are developmentally important molecules which we discovered play a critical role in regulating injury-induced vascular remodeling and neuroinflammation. This work was recently published in the Journal of Clinical Investigations. We interrogate Eph signaling using conditional gene targeted approaches in murine models. We also use a variety of cellular, molecular and advanced imaging tools to further our investigations with an emphasis on neurovascular and neuroimmune health.

Research Productivity:
Active Grants:
PI: R01 NS096281 Mechanisms regulating cerebral arteriogenesis and neuro-restoration. No cost extension through 2021
PI: R01 NS112541 Novel Cellular and Molecular Regulation of Collateral Remodeling in Ischemic stroke. Ends 2024
Multi-PI: Vascular Injury, Gliosis and Aberrant Neurogenesis as Drivers for Post-traumatic Epilepsy. Ends 2021
Co-I: American Heart Association Transformative Project Award- Ischemic-induced pericyte loss and BBB fragility. Ends 2021
PI: Research Acceleration Program (RAP) Carilion Medical Center- Interrogating Human Serum Expression of EphA4 and Collateral Vessel Function Following Acute Ischemic Stroke. Ends 2022
Co-I: R01 AG071661-01 Interstitial fluid flow in Alzheimer's disease progression. Ends. 2026

Recent publications:

Greer K, Basso K, Kelly C, Cash A, Kowalski E, Ocampo C, Wang X and Theus MH*. Abrogation of atypical neurogenesis and vascular-derived EphA4 prevents repeated mild TBI-induced learning and memory impairments. Scientific Reports. 2020. Sep 21;10(1):15374. Impact Factor: 4.5
Cash A, and Theus MH*. Mechanisms of blood-brain barrier dysfunction in traumatic brain injury. International Journal of Molecular Science. 2020. May 8. 21(9), 334.
Okyere B, Mills T, Kowalski EA, Wang X, Chen M, Chen Ji, Hazy A, Qian Y, Wang X, Matson J and Theus MH*. EphA4/Tie2 crosstalk regulates leptomeningeal collateral remodeling following ischemic stroke. Journal of Clinical Investigation. 2020. Jan. 21. PMID: 31689239; Impact Factor: 12.282
Patridge B, Rossmeisl JH, Kaloss AM, Basso, EKG and Theus MH*. Novel ablation methods for treatment of gliomas. Journal of Neuroscience Methods. 2020 Feb 13. PMID 32068011; Impact Factor: 2.8

Honors or recognitions:
Co-Director, TBMH graduate program
Vice Chair for the Precision Medicine Track, Center for Engineered Health

Overview of mentor activities:
Virginia Tech (CURRENT):
Postdoctoral Associates:
Elizabeth Kowalski, since 5/2017
Kristobal Basso, since 11/2018
Eman Soliman, since 8/2020
Graduate Candidates/ Medical Students:
Alison Cash, DVM/PhD candidate, since 2017
Alexandra Kaloss, DVM/PhD candidate, since 2019
Jing Ju, PhD candidate, since 2019
Miranda Creasey, MD candidate, since 2017 *Letter of Distinction for Research Scholarship

Recent TRAINEES:
Graduate:
Yeonwoo Lebovitz, PhD 2019, Translational Biology Medicine & Health, (VT), Health Policy Associate, NIH FDA
Amanda Hazy, DVM/PhD 2019, Biomedical Sciences Graduate Student, (VT) DVM student, VT
Kisha Grisham (IMSD scholar), Ph.D. 2019, Translational Biology Medicine & Health, (VT) current Postdoctoral Associate at the NIH
Summer DVM students:
Yiannis Sotiropoulos, Veterinary summer student program, (VT) 2019
Andrea Oliver, Veterinary summer student program, (VT) 2018
Undergraduate Students:
Laura Bochicchio, Undergraduate trainee, Fall 2016-Spring 2018, Current grad student TBMH
Mathew Byerly, Summer 2017-Summer 2018, Current Med school applicant
Christian Smith, Graduate 2019, since Summer 2017
Madisen Lee, Graduate 2019, since Summer 2017
Colin Kelly, Current research assistant Theus Lab 2019, Undergrad since Spring 2018
Collin Tanchanco Ocampo, Current Trainee, past trainee, Fall 2018-2019. *Robert H. Jones Biology Undergraduate Excellence Award, 2018-2019
Rachael Ward, Current trainee Spring 2018-2019 *VT-Fralin undergraduate research fellowship award 2018-2019, VT School of Neuroscience
Cameron Cashwell, Graduate 2019, past trainee, Fall 2017-Spring 2019.
Sarah Bryant, Fall 2018-2020, VT School of Neuroscience
Nathalie Groot, Fall 2019-2020, VT School of Neuroscience
Gabe Coleman, Fall 2018-2020 *VT SURF program award, 2019, VT School of Neuroscience

POPULATION HEALTH SCIENCES
KATHY HOSIG, PH.D, MPH, RD

Associate Professor & Director, Center for Public Health Practice and Research
Population Health Sciences

Research Program Overview: Dr. Kathy Hosig is Associate Professor in the Department of Population Health Sciences at Virginia Tech, Public Health Specialist for Virginia Cooperative Extension, and Director for the Virginia Tech Center for Public Health Practice and Research (CPHPR). CPHPR is housed in the Department of Population Health Sciences and is supported by the Institute for Society, Culture and Environment. The mission of CPHPR is to foster interdisciplinary, collaborative public health practice and research activities at Virginia Tech and among external public health agencies, organizations, practitioners and researchers.

Dr. Hosig's research and practice projects funded by NIH, USDA, CDC and SAMHSA focus on implementation and evaluation of evidence-based interventions to prevent and manage lifestyle-related chronic diseases such as diabetes, hypertension, heart disease and substance misuse/addiction. Her experience with developing collaborative partnerships at the local and state levels for these projects informs her work as co-lead for the Community and Collaboration Core of the integrated Translational Research of Virginia (collaborative NIH-funded Clinical Translational Science Award – CTSA among the University of Virginia, Virginia Tech, Carilion Clinic and Inova Healthcare).

Research Productivity:
Current Grants:
Substance Abuse and Mental Health Services Administration 08/31/2020 – 08/30/2022 $1,099,739. Grant #1H79TI083273-01. Virginia Cooperative Extension Partnerships for Rural Opioids Technical Assistance. Expansion of SAMHSA-funded project to disseminate evidence-base substance misuse prevention curricula in public schools and support community coalitions. Role: Project Director
Piedmont Regional Community Services $147,980 08/30/2020 – 8/29/2025 Flowthrough subcontract from SAMHSA Strategic Prevention Framework – Partnerships for Success grant via prime award to PRCS. Creating a Resilient Martinsville Henry County. Role: Evaluator.
United States Department of Agriculture $324,841 09/01/2019 - 08/31/2021 Award #2019-46100-30274. National Institute of Food and Agriculture. Preventing and Reducing Opioid Misuse and Abuse in Rural Virginia. Community-based prevention of opioid misuse and addiction. Role: Evaluator. Project Director: Crystal Tyler-Mackey.
National Institutes of Health $22,601,338 02/28/2019 – 01/31/2024 Grant # 1 U54 TR002586-01. Clinical Translational Science Award (CTSA). The integrated Translational Health Research Institute of Virginia (iTHRIV): Using data to improve health. Role: Co-lead, Community and Collaboration Core. PI: Karen Johnston, University of Virginia.
Centers for Disease Control and Prevention $2,500,000 09/30/2018 – 09/29/2023 CDC 1809 - Grant #1 NU58DP006566-01-00. Empowering Healthy Lifestyles to Reduce Obesity in Petersburg, VA. Policy, systems and environment strategies to improve nutrition and physical activity. Role: Project Director.
United States Department of Agriculture $1,200,000 09/30/2018 – 09/29/2023 National Institute of Food and Agriculture. Helping Youth PROSPER and Avoid Opioid Misuse in Virginia. Community-based prevention of opioid misuse and addiction targeting sixth and seventh graders in four Virginia counties. Role: Evaluator. Project Director: Crystal Tyler Mackey.
United States Department of Agriculture $2,250,311 03/01/18 – 02/28/2023 Award #2018-68001-27549. National Institute of Food and Agriculture. Church, Extension and Academic Partners Empowering Healthy Families. Family- and church-based childhood obesity prevention project stemming from completed NIH-funded type 2 diabetes study; requested by community partners. Role: Principal Investigator

Recent publications and refereed presentations:

Kennedy LE, Hosig K, Ju Y, Serrano E. Evaluation of a mindfulness-based stress management and nutrition education program for mothers. Cogent Social Sciences. 2019; 5: 1682928. Available at: https://www.tandfonline.com/doi/full/10.1080/23311886.2019.1682928
Richardson MB, Chmielewski C, Wu, CYH, Evans MB, McClure LA, Hosig KW, Gohlke JM. The effect of time spent outdoors during summer on daily blood glucose and steps in women with type 2 diabetes. J Behav Med. 2019; November. DOI: https://doi.org/10.1007/s10865-019-00113-5
Jiles KA, Chase M, Hosig K, Wenzel S, Schlenker E, Rafie C. Developing a Master Food Volunteer Continuing Education Program: A Model for Volunteer Capacity. Journal of Extension. 2019; 57 (2): article # 2RIB10. https://www.joe.org/joe/2019april/rb10.php
Hosig K, Motley M, Savla J. Childhood obesity prevention with church, Extension and academic partners in an integrated randomized control trial. Journal of Nutrition Education and Behavior, 2019: 51 (7), S22–S23. https://www.jneb.org/article/S1499-4046(19)30583-4/fulltext

Honors or recognitions:
Clinical and Translational Science Institute at Children's National (CTSI-CN) External Advisory Board
Appalachian Translational Research Network Executive Committee
Wake Forest Baptist Comprehensive Cancer Center Community Advisory Board
Virginia State University Public Health Institute Advisory Committee
Southwest Virginia Graduate Medical Education Consortium Advisory Board

Overview of mentor activities: Dr. Hosig serves as major advisor for approximately six MPH students each year, including several students who pursue the MPH degree simultaneously with graduate degrees (PhD and MS) in other departments. She also serves on four to five doctoral committees for students in departments including Human Nutrition, Foods & Exercise, Human Development and Family Science, School of Public and International Affairs, and School of Architecture + Design. She serves as Track Leader for the Public Health and Implementation Science track in the Translational Biology, Medicine and Health (TBMD) graduate program. Dr. Hosig graduated two PhD students from the BMVS program in 2015 and is currently serving as dissertation advisor for a PhD student in the TBMH program.

COMPARATIVE, TRANSLATIONAL, & VETERINARY RESEARCH

JOANNE TUOHY, DVM, PHD, DACVS-SA

Interim Director, Animal Cancer Care and Research Center
Assistant Professor,Surgical Oncology
Small Animal Clinical Sciences

Research Program Overview: The overall goal of my research is to improve treatments and outcomes for oncology patients, especially patients suffering from osteosarcoma. I firmly believe in the strength of a One Health approach to comparative oncology research, which can benefit both veterinary and human cancer patients. My research focuses on evaluating novel tumor ablation techniques in order to improve treatment of the primary tumor as well as advance the development of immunotherapy for the treatment of metastatic disease. Histotripsy, a non-thermal, non-invasive focused ultrasound technique, can successfully ablate osteosarcoma cells. Osteosarcoma, a devastating bone cancer that affects both dogs and humans, has not seen significant strides in survival outcomes for the past 3 decades in both species. Current options for removing the primary tumor in osteosarcoma either require limb amputation or surgical limb salvage techniques, both of which have their limitations and complications. Metastatic disease has been the major hurdle to improvements in osteosarcoma survival, despite the multiple permutations of chemotherapeutics that have been evaluated. Histotripsy, with its strong potential to ablate tumor cells and upregulate the immune system, is an exciting avenue of comparative oncology investigation to target the primary tumor and metastasis in osteosarcoma. The similarities in biological behavior, histological characteristics, and genetic signatures of human and canine osteosarcoma, coupled with the dog being an outbred species sharing the environment with humans, makes the dog an excellent comparative model for osteosarcoma research.

Research Productivity:

Recent Grants:

Tuohy JL (PI)
Co-I: Vlaisavljevich E, Dervisis NG, Klahn SL, Allen IC, Coutermarsh-Ott SL, Clapp KS.
Histotripsy as a novel limb salvage treatment and immunotherapy for osteosarcoma.
Direct sponsor: National Institutes of Health

Tuohy JL (PI)
Co-I: Vlaisavljevich E, Dervisis NG, Klahn SL, Allen IC, Coutermarsh-Ott SL, Clapp KS.
Histotripsy for treatment of canine appendicular osteosarcoma
Direct sponsor: Focused Ultrasound Foundation

Tuohy JL (PI)
Co-I: Davalos RV, Dervisis NG, Coutermarsh-Ott S, Allen IC.
Evaluation of high frequency irreversible electroporation for treatment of canine lung tumors.
Direct sponsor: Veterinary Memorial Foundation

Tuohy JL (PI)
Co-I: Davalos RV, Coutermarsh-Ott S, Dervisis NG.
Evaluation of high frequency irreversible electroporation (H-FIRE) for treatment of canine insulinoma
Direct sponsor: American College of Veterinary Surgeons

Recent publications: 2020 publications

Latifi M, Tuohy JL, Coutermarsh-Ott SL, Klahn SL, Leeper H, Dervisis N. Clinical outcomes in dogs with localized splenic histiocytic sarcoma treated with splenectomy with or without adjuvant chemotherapy. Journal of Veterinary Internal Medicine 2020;34:2645-2650. PMID: 32986268

Tuohy JL, Shaevitz MH, Garrett LD, Ruple A, Selmic LE. Demographic characteristics, site and phylogenetic distribution of dogs with appendicular osteosarcoma: 744 dogs (2000-2015). PLoS ONE 14(12):e0223243 https://doi.org/10.1371/journal.pone.0223243. PMID: 31887114

Tuohy JL, Somarelli J, Borst L, Eward W, Lascelles BDX, Fogle JE. Immune dysregulation and osteosarcoma: Staphylococcus aureus downregulates TGF-β and heightens the inflammatory signature in human and canine macrophages suppressed by osteosarcoma. Veterinary and Comparative Oncology 2020 Mar;18(1):64-75 PMID: 31420936

Somarelli JA, Boddy A, Gardner HL, DeWitt SB, Tuohy J, Megquier K, Sheth MU, Hsu D, Thorne JL, Eward WC. Improving cancer drug discovery by studying cancer across the tree of life. Molecular Biology and Evolution 2020 Jan 1;37(1):11-17. PMID: 31688937

Risselada M, Tuohy JL, Law M, James ML, Lascelles BDX. Local administration of carboplatin in poloxamer 407 after an ulnar osteosarcoma removal in a dog. Journal of the American Animal Hospital Association 2020; 56(6):325-330. PMID: 33113558.

Bae S, Milovancev M, Bartels C, Irvin V, Tuohy JL, Townsend K, Leeper H. Histologically low-grade, yet biologically high-grade, canine cutaneous mast cell tumours: a systematic review and meta-analysis of individual participant data. Veterinary and Comparative Oncology 2020 Dec;18(4):580-589. PMID: 32103587

Griffin MA, Culp WTN, Giuffrida MA, Ellis P, Tuohy JL, Perry JA, Gedney A, Lux CN, Milovancev M, Wallace ML, Hash J, Mathews K, Liptak JM, Selmic LE, Singh A, Palm CA, Balsa IM, Mayhew PD, Steffey MA, Rebhun RB, Burton JH, Kent MS. Feline Lower Urinary Tract Transitional Cell Carcinoma: Clinical Findings, Treatments and Outcomes in 118 Cats. Journal of Veterinary Internal Medicine. 2020 Jan;34(1):274-282. PMID: 31721288

Milovancev M, Townsend KL, Tuohy JL, Gorman E, Bracha S, Curran KM, Russell DS. Long-term outcomes of dogs undergoing surgical resection of mast cell tumors and soft tissue sarcomas: a prospective 2 year-long study. Veterinary Surgery 2020 Jan;49(1):96-105. PMID: 31044443

Overview of mentor activities:: I enjoy mentoring students and house officers in both the clinical and research spaces. I find it extremely rewarding to help students cultivate their clinical skills as they progress through their clinical rotations. In the research laboratory, I enjoy teaching students about the basics of research and help them progress in their scientific thinking. At this time, I directly mentor 2 professional veterinary students in the research laboratory, and have submitted a student scholar grant application with one of the students. I also directly mentor house officers in both the clinical and basic science research spaces, and gain immense satisfaction in their successful publications of manuscripts resulting from their projects. I serve on the PhD committees of 3 doctoral thesis students.

SELECTED RECENT PUBLICATIONS FROM RESEARCH AREAS

PATHOGENIC MICROBIOLOGY & INFECTIOUS DISEASES

Jain-Gupta N, Waldrop SG, Tenpenny NM, Witonsky SG, Boyle SM, Sriranganathan N. Rough Brucella neotomae provides protection against Brucella suis challenge in mice. Vet Microbiol. 2019 Dec;239:108447. doi: 10.1016/j.vetmic.2019.108447. Epub 2019 Oct 4. PMID: 31767087.

Lei S, Twitchell EL, Ramesh AK, Bui T, Majette E, Tin CM, Avery R, Arango-Argoty G, Zhang L, Becker-Dreps S, Azcarate-Peril MA, Jiang X, Yuan L. Enhanced GII.4 human norovirus infection in gnotobiotic pigs transplanted with a human gut microbiota. J Gen Virol. 2019 Nov;100(11):1530-1540. doi: 10.1099/jgv.0.001336. PMID: 31596195; PMCID: PMC7137776.

NEUROPATHOBIOLOGY

Porter DDL, Morton PD. Clearing techniques for visualizing the nervous system in development, injury, and disease. J Neurosci Methods. 2020 Jan 13;334:108594. doi: 10.1016/j.jneumeth.2020.108594. Epub ahead of print. PMID: 31945400.

Powell-Doherty RD, Abbott ARN, Nelson LA, Bertke AS. Amyloid-β and p-Tau Anti-Threat Response to Herpes Simplex Virus 1 Infection in Primary Adult Murine Hippocampal Neurons. J Virol. 2020 Apr 16;94(9):e01874-19. doi: 10.1128/JVI.01874-19. PMID: 32075924; PMCID: PMC7163132.

POPULATION HEALTH SCIENCES

Errecaborde KM, Rist C, Travis DA, et al. Evaluating One Health: the role of team science in multisectoral collaboration. Rev Sci Tech. 2019;38(1):279-289. doi:10.20506/rst.38.1.2960

Richardson MB, Chmielewski C, Wu CYH, Evans MB, McClure LA, Hosig KW, Gohlke JM. The effect of time spent outdoors during summer on daily blood glucose and steps in women with type 2 diabetes. J Behav Med. 2020 Oct;43(5):783-790. doi: 10.1007/s10865-019-00113-5. Epub 2019 Nov 1. PMID: 31677087.

IMMUNE-MEDIATED & INFLAMMATORY DISEASES

Dai, R., Heid, B., Xu, X., Xie, H., Reilly, C. M., & Ahmed, S. A. (2020). EGR2 is elevated and positively regulates inflammatory IFNγ production in lupus CD4+ T cells. BMC immunology, 21(1), 41. https://doi.org/10.1186/s12865-020-00370-z

Nagai-Singer MA, Hendricks-Wenger A, Brock RM, Morrison HA, Tupik JD, Coutermarsh-Ott S, Allen IC. Using Computer-based Image Analysis to Improve Quantification of Lung Metastasis in the 4T1 Breast Cancer Model. J Vis Exp. 2020 Oct 2;(164). doi: 10.3791/61805. PMID: 33074250.

COMPARATIVE, TRANSLATIONAL, & VETERINARY RESEARCH

Menarim BC, Gillis KH, Oliver A, Mason C, Ngo Y, Werre SR, Barrett SH, Luo X, Byron CR, Dahlgren LA. Autologous bone marrow mononuclear cells modulate joint homeostasis in an equine in vivo model of synovitis. FASEB J. 2019 Dec;33(12):14337-14353. doi: 10.1096/fj.201901684RR. Epub 2019 Oct 30. PMID: 31665925.

Wilkinson AR, DeMonaco SM, Panciera DL, Otoni CC, Leib MS, Larson MM. Bile duct obstruction associated with pancreatitis in 46 dogs. J Vet Intern Med. 2020 Sep;34(5):1794-1800. doi: 10.1111/jvim.15879. Epub 2020 Aug 27. PMID: 32852140; PMCID: PMC7517504.

Partridge B, Rossmeisl JH Jr. Companion animal models of neurological disease. J Neurosci Methods. 2020 Feb 1;331:108484. doi: 10.1016/j.jneumeth.2019.108484. Epub 2019 Nov 13. PMID: 31733285; PMCID: PMC6942211.

VMCVM
COVID RESPONSE

COVID-RELATED PROPOSAL SUBMISSIONS
73 Proposals

EXTERNAL AWARDS

JAMES WEGER, *Biomedical Sciences and Pathobiology*

"SARS-CoV-2 in apparently healthy health care workers and molecular tools to study virus evolution"
NIH Subaward *Amount $45,318*

"EAGER: Integrating Genotype, Phenotype, and Environment to Identify Biomarkers of Coronavirus Disease Severity and Transmission"
NSF *Amount:297,382*

"Experimental evolution of SARS-CoV-2 as a new tool to identify adaptive changes in the viral genomes, with implications for replication, infectivity, and COVID-19 outbreaks"
VCOM *Amount: $38,201*

ANDREA BERTKE (CO-I), *Population Health Sciences*

Reza Ovissipour (PI)
"An integrated approach to address COVID-19 concerns in food supply chain"
NIFA *Amount: $999,059*

ANDREA BERTKE, *Population Health Sciences &*
BLAISE COSTA, *Biomedical Sciences and Pathobiology*

"Identification and Characterization of Mechanically Distinct Novel Anti-Viral Agents"
VCOM *Amount: $12,161*

KYLENE KEHN-HALL, *Biomedical Sciences and Pathobiology*

"SARS-CoV-2 Ivermectin Validation Study"
Monash Univerity *Amount: $64,966*

"SARS-CoV-2 (Covid 19) Inducing Cytokine Release Syndrome"
Georgetown University *Amount: $12,500*

"Impact of Silicon Nitride on SARS-Cov-2"
SINTX Technologies Corp *Amount: $89,731*

"SP16 efficacy testing in SARS-CoV-2 infected mice"
Serpin Pharma, Inc *Amount: $19.796*

JULIE GOHLKE, *Population Health Sciences*

"Recovery during a Crisis: Identifying recovery challenges and opportunities in Southwest Virginia during the COVID-19 Pandemic"
East Tennessee State University *Amount: $4750*

VMCVM EMERGENCY COVID RESEARCH FUNDING

XJ MENG, *Biomedical Sciences and Pathobiology*

Co-I: H. Soorynarain
"Establishment of a SARS-CoV-2 Psuedovirus for virus neutralization"

LIJUAN YUAN, *Biomedical Sciences and Pathobiology*

“A Rapid development of broadly neutralizing antibodies against SARS-COV-2 for topical lung and intravenous delivery”

ANDREA BERTKE, *Population Health Sciences*

Co-Is: Auguste, J. Weger
"SARS-CoV-2 Neurotropism and Anosmia”

NISHA DUGGAL, *Biomedical Sciences and Pathobiology*

"SARS-CoV-2 Infection and Pregnancy complications and premature delivery”

TESSA LECUYER, *Biomedical Sciences and Pathobiology*

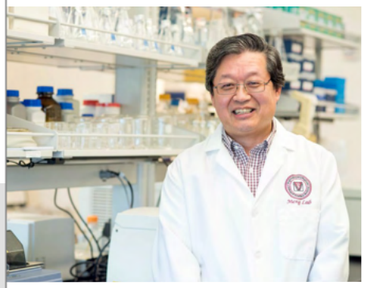
Co-Is: LeRoith, K. Lahmers
"Specificity of SARS-CoV2-serological assay targets in domestic cats”

NATALIE COOK, *Population Health Sciences*

Co-Is: Wenzel, K. Hosig, R. Silverman
“How do Virginians receive, interpret, and respond to COVID-19 prevention messages”

TANYA LEROITH, *Biomedical Sciences and Pathobiology*

Co-Is: Coutermarsh-Ott, B. Huckle
“Development of SARS-CoV2-specific reagents for pathogenesis studies”



CENTER FOR EMERGING, ZOONOTIC, AND ARTHROPOD-BORNE PATHOGENS (CEZAP)

The vision of the center positions Virginia Tech to become a national and international research and training resource that is a leader in advancing transformative science and developing effective countermeasures against emerging infectious diseases.

The new center, led by Dr. XJ Meng, will be administratively established in the Fralin Life Science Institute and will include faculty participants from at least seven colleges and more than 25 departments on campus.

CEZAP FACULTY RESEARCH PILOT GRANT PROGRAM

The Center for Emerging, Zoonotic, and Arthropod-borne Pathogens (CeZAP) at Virginia Tech requests pilot grant applications to build interdisciplinary research teams in the broad area of infectious diseases, leading to collaborative extramural grant submissions. These pilot grants are supported financially by Fralin Life Sciences Institute and Agency 229. Priority will be given to proposals seeking to advance CeZAP’s mission to promote and foster interdisciplinary and transdisciplinary research collaborations across different colleges.

NISHA DUGGAL, *Biomedical Sciences and Pathobiology*

Linsey Marr (Co-PI, COE); Stanca Ciupe (Co-PI, COS)
"Aerosol transmission potential of SARS-CoV-2 in exhaled breath"

FRALIN LIFE SCIENCE INSTITUTE (FLSI) FUNDS TO GENERATE KEY REAGENTS AND BUILD CAPACITY FOR COVID-19 RESEARCH AT VIRGINIA TECH

IRVING COY ALLEN, *Biomedical Sciences and Pathobiology*

Co-I: Jonathan Auguste, Department of Entomology, College of Agriculture and Life Sciences
"Establishment of ACE2 transgenic mice colony for COVID-19 research at Virginia Tech"

NISHA DUGGAL AND JAMES WEGER, *Biomedical Sciences and Pathobiology*

"Establishment of a SARS-CoV-2 reverse genetics system to facilitate COVID-19 research"

COVID-19 PUBLICATIONS BY VMCVM FACULTY

SARS-CoV-2 infection in the gastrointestinal tract: fecal-oral route of transmission for COVID-19? Meng XJ, Liang, TJ. Gastroenterology 2021 Jan 7:S0016-5085(21)00030-5. doi:10.1053/j.gastro.2021.01.005

PSGL-1 Inhibits the incorporation of SARS-CoV and SARS-CoV-2 spike glycoproteins into pseudovirions and impairs pseudovirus attachment and infectivity. He S, Waheed AA, Hetrick B, Dabbagh D, Akhrymuk IV, Kehn-Hall K, Freed EO, Wu Y. Viruses. 2020 Dec 30;13(1):46; doi:10.3390/v13010046

Improved plaque assay for human coronaviruses 229E and OC43. Bracci N, Pan HC, Lehman C, Kehn-Hall K, Lin SC. PeerJ. 2020 Dec 21;8:e10639. doi: 10.7717/peerj.10639.

A selective sweep in the Spike gene has drive SARS-CoV-2 human adaptation.Kang L, G. He, A.K. Sharp, X. Wang, A.M. Brown, P. Michalak, J. Weger-Lucarelli. BioRxiv. doi:10.1101/2021.02.13.431090

VMCVM COVID RELATED INFRASTURCTURE IMPROVEMENT

- Investments were made to upgrade equipment in the IDU to accommodate the growing needs of increased number of BSL3 researchers including the creation of a new IDU use committee for improving the efficiency of operations of IDU.
- Supported breeding colony of unique ACE2 mouse model for COVID researchers.

RESEARCH
SUPPORT

VMCVM SERVICES CENTERS

Analytical Chemistry Research Laboratory (Pharmacology and Toxicology)
The lab provides a variety of enzyme assays, qualitative and quantitative determination of the concentration of drugs, heavy metals, toxins, pesticides, as well as metabolism and pharmacokinetic studies.
Contact: Dr. Jennifer Davis, Analytical Lab Supervisor, 540-231-2192 or jdavis4@vt.edu or McAlister Council-Troche, Analytical Lab Manager, 540-231-4835 or rmct@vt.edu

Electron Microscope Lab
The lab is equipped with instrumentation for ultrastructural analysis of biological and non-biological materials to provide investigators with data concerning specimen morphology.

Flow Cytometry
The lab provides the latest technologies in flow cytometry to enhance research.
Learn more: Flow Cytometry instrumentation and services
Contact: Melissa Makris, Flow Cytometry Lab Supervisor, 540-231-4115 or mmakris@vt.edu

Quality Assurance Unit
The lab provides oversight to monitor studies conducted in compliance with the federal Good Laboratory Practice (GLP) regulations.
Contact: Sandy Hancock, Good Laboratory Practice Program and Quality Assurance Unit, 540-231-4817 or skperkin@vt.edu

Sterilization and Laboratory Support Services
The lab provides a constant supply of washed and sterilized glassware, plastics, and media that is essential for research activities.
Contact: Andrea Renshaw, Laboratory Support Technician, 540-231-4829 andreajr@vt.edu; Debby Coley dsaville@vt.edu (COHR), or Dean Compton (ILSB)

Study Design and Statistics
The lab assists with design, planning, and implementation of research projects, data management and analysis, evaluation, and presentation of data and information.
Contact: Dr. Stephen Werre, Study Design & Statistical Analysis Lab Supervisor, 540-231-3522 or swerre@vt.edu

TRACSS
The Teaching and Research Animal Care Support Service (TRACSS) provides policies, guidelines, and support to assist investigators with research projects while ensuring compliance with Federal law and regulatory agency policies.
Find resources on our college intranet or contact Karen Hall, TRACSS Supervisor, at kgetzewi@vt.edu or 540-231-4318.

COVID REGULATIONS FOR RESEARCHERS

In the spring semester, Virginia Tech will continue its research in a manner that recognizes the importance of safety, transitions back to an in-person student-learning experience, and continues to ramp up research programs. Current information for researchers can be found on the VT Ready website.

NEW WEBSITE CONTENT

Don't forget to periodically check the new BMVS website.
We are continuously updating the content.

UNDER CONSTRUCTION

We are working to migrate the research website to the CMS content system. The new website should be live by April 2021. We have integrated new content during the migrate and will work to continue to build on the site.

Please send suggestions for content!

RGS BLOG

The Office of Research and Graduate Studies now has it own blog. The purpose of the blog is to share news and accomplishments of our researchers and graduate student. Please visit the site to see what our researchers and students are working on. We welcome submissions for the college for blog posts. You can submit your news right from the RGS blog site.

VT-FAST

The Virginia Tech Faculty Activity Support Team (VT-FAST) is a virtual team of faculty and staff across campus who support faculty in all aspects of proposal development. Our goal is to facilitate proposal submission, allowing faculty to focus on the research plan.

VT-FAST support ranges from single-investigator proposals to larger, more complex proposals involving teams with external partners. Support also includes both pre- and post-award activities.

INTERNAL GRANTS

SEED FUNDING MECHANISMS

Internal funding mechanisms have been expanded to support VMCVM faculty.

Link to internal award timeline

VETERINARY MEMORIAL FUND (VMF)

DEADLINE: MARCH 12, 2021

VMF funds are to be used to support research in veterinary clinical sciences with the goal of improving health care for animals. Projects with direct clinical relevance were prioritized for funding.

INTERNAL RESEARCH COMPETITION (IRC)

DEADLINE: MARCH 19, 2021

The Internal Research Competition provides small seed grants for basic, interdisciplinary and translational research with the goal of collecting enough data to help procure external funding. The underlying goal of this seed funding mechanism is to enhance our research priority areas that include (but not limited to) infectious diseases and immunity, inflammatory diseases, regenerative medicine, comparative oncology, and Destination Area aligned research. 229-related research proposal are also funded through IRC.

EQUINE RESEARCH COMPETITION (ERC)

DEADLINE: MARCH 5, 2021

The Equine Research Competition provides small seed grants for basic, interdisciplinary, and translational clinical research in equines with the goal of collecting enough data to help procure external funding. The underlying goal of this seed funding mechanism is to enhance our equine research priority areas that include (but not limited to) infectious diseases and immunity, inflammatory diseases, regenerative medicine, and musculoskeletal.

229 ANIMAL HEALTH AND DISEASE RESEARCH PROJECTS

Research operational support for projects related to the Animal Health and Disease Research program to study basic and applied studies on infectious and non-infectious agents that impair the normal state of the animal body and/or that affect the performance of vital functions. Includes laboratory studies research on metabolic diseases and other diseases, application of molecular biology to animal health problems. These five-year projects must be submitted to the VAES Experimental Station and require yearly reporting. Projects closely aligned with the 229 mission may also be funded through the IRC mechanism, contingent upon the merit of the proposals and funds' availability.

ONE HEALTH RESEARCH SEED GRANTS

CALL SEND OUT AROUND APRIL/MAY

One Health program was created to foster collaboration between faculty from VMCVM and VCOM. Each project must have a principal investigator from VT and VCOM.

VMCVM RESEARCH SPACE RENOVATIONS

CENTER FOR ONE HEALTH RESEARCH (COHR)

Lab renovations were recently completed at COHR . These labs will be used by Dr. Mohamed Seleem, our new Tyler J. and Frances F. Young Chair in Bacteriology Professor. His lab is focused on developing new antimicrobials and improving delivery of drugs for the treatment of infectious diseases.

OTHER INFRASTRUCTURE INVESTMENTS

Funded several key pieces of equipment for the Animal Cancer Care and Research Center.

Improved a separate animal facility at COHR for Dr. Weger's NSF project on the Mouse Hepatitis Virus (MHV) that require an isolated facility.

SHARED CLINICAL RESEARCH LAB (PHASE 2)

The College recognized a need for laboratory space dedicated to the clinical faculty that contribute to our research program. Several labs in Phase 2 were renovated based on the concept of a clinical shared lab for multi-departmental clinical research activities. This space provides two large open lab spaces with several individual rooms for prep, cell culture, etc. The space also have a lounge for graduate students.

INPUT ON EQUIPMENT PURCHASES

RGS seeks your input for instrumentation requests.
We have several opportunities through the year to request support for purchasing shared VMCVM equipment. RGS maintains a request list in order to be responsive to these calls. Created and improved a college-wide list of major VMCVM equipment, a link to be used in grant applications and to facilitate researchers to identify various equipment in different VMCVM locations. A list of equipment can be found here:
VMCVM Equipment List

We continue to support researchers by funding annual Class II hood certifications, pipette calibrations, balance calibrations, purchase of critical pieces of equipment, service contracts for sensitive pieces of equipment, and workhorses such as freezers and incubators, among other laboratory needs.

BMVS
PROGRAM OVERVIEW

The overarching goals of the Biomedical and Veterinary Sciences (BMVS) graduate program is to provide rigorous training experiences for students interested in the fundamentals of life science research and its potential application to improve the health of humans and domestic animal species. The MS program under BMVS has principally been the home of our DVM residents undergoing specialty veterinary medical training, alongside which a thesis-based research project has been an important component. Our PhD program is flexible and offers in-depth training in animal models for diseases, translational research, veterinary clinical research, and population health medicine. There are multiple ways of getting PhD in our BMVS program that include: straight PhD; Combined DVM and PhD; Post-DVM PhD (supported by NIH T32 grant); combined clinical veterinary residency and PhD.

Our doctoral program will have core courses and in-depth subject-based courses in five major overlapping subject areas (tracks) that are based on the research strengths of our existing faculty members (within our college and across the university) and on predicted areas of growth in biomedical and health sciences.

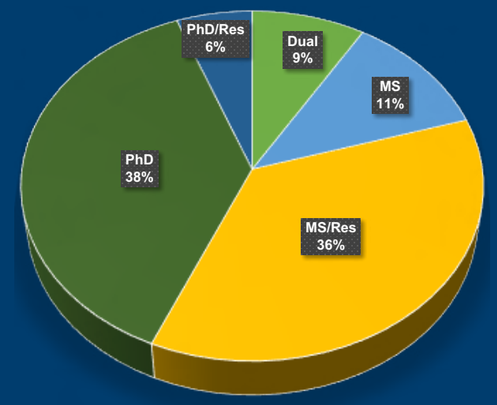
PhD students will be trained in the following five interactive tracks. These include:

(1) Pathogenic Microbiology (Infectious Diseases includes bacterial, viral, parasitic and fungal diseases)
Research themes include: Animal models for human and veterinary infectious diseases. Understanding the pathogenesis of the diseases, Immunity to infectious and its prevention (development of vaccines and drugs; Mechanisms of drug resistance, and translational research

(2) Immune-mediated and Inflammatory Diseases
Research themes include: Animal Models for immune-mediated diseases; Understanding the mechanisms of such as autoimmune diseases and inflammatory diseases (e.g.. inflammatory bowel disease). Specific interests include role of epigenetics, microbiome and environmental hormonal factors on these diseases; transition of inflammation leading to cancer; induction of immunity in oncologic conditions, and translational research.

BIOMEDICAL AND VETERINARY SCIENCES
VIRGINIA TECH™

FY 20 BMVS PROGRAM
69 STUDENTS



(3) Neuropathobiology
Research themes include: Animal Models for neurodevelopment and traumatic injury, neurovascularization, neuroinflammation, and neurooncology, and translational research.

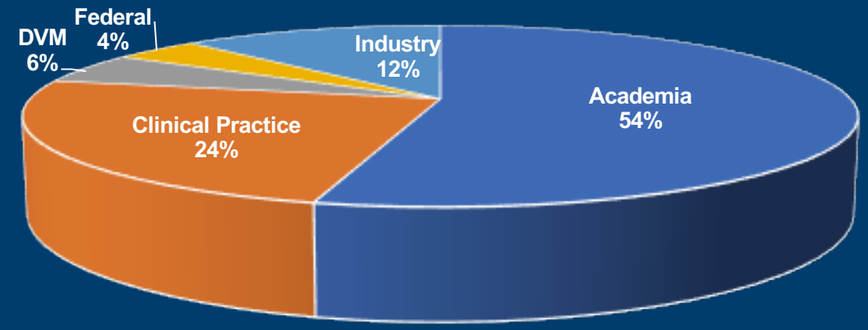
(4) Comparative, Translational, & Veterinary Reesarch
Research themes include: cancer biology, genomics and therapeutics; Clinical Veterinary medicine research and translational medicine from laboratory animals to clinical veterinary and human patients; Stem cell biology and its application; Clinical trials management and human-animal bond/interactions

(5) Population Health Science
Research themes include: Infectious diseases epidemiology (in humans and animals); and public health education.

The majority of our PhD graduates (including those who also hold the DVM) have been productively employed in medical schools, veterinary colleges, the pharmaceutical and biotech industries, and health science-related federal agencies (CDC, USDA, NIH, FDA). The academic background and preparation during this rigorous PhD program have contributed to their academic, scientific and clinical success in their chosen fields.

bmvs.vetmed.vt.edu

WHERE ARE OUR ALUMNI CURRENTLY EMPLOYED?



SELECT EMPLOYERS

Over the past few years, several of our graduates have joined the VMCVM faculty ranks: Sophie Bogers, Sheryl Coutermarsh-Ott, Kristin Eden, Audrey Keebaugh, Giulio Menciotti, Dominique Sawyere Hansford, Richard Shinn, Lauren Trager, and Ashley Wilkinson

Stanford University
CDC Centers for Disease Control and Prevention
Google
University of California Irvine
Colorado State University
USDA
IDEXX Laboratories
Agnes Banks Equine Clinic
Cornell University Veterinary Specialists
Virginia-Maryland College of Veterinary Medicine
University of Pittsburgh
University of London
Yale
VTC Virginia Tech Carilion Research Institute
Johns Hopkins University

BMVS
ACHIEVEMENTS

2019 ANNUAL RESEARCH SYMPOSIUM

OUTSTANDING MS POSTER PRESENTATION:
Michelle Greer
Kayla Waler
OUTSTANDING MS ORAL PRESENTATION:
James Blake Everett
OUTSTANDING PHD POSTER PRESENTATION:
Brittanie Partridge
Melissa Mercer
OUTSTANDING PHD ORAL PRESENTATION:
Sarah Kuchinsky
Alessandra Franchini

GRADUATE AWARDS (2020)

Outstanding VMCVM Mentor Award: Dr. Coy Allen
Outstanding VMCVM nominee for the MS Award: Dr. Giulio Menicotti. (Mentor: Dr. Borgarelli)
Outstanding VMCVM nominee for the PhD Award: Dr. Bruno Carvalho Menarim (Mentor: Dr. Dahlgren)

2020 VCOM-VIRGINIA CAMPUS RESEARCH RECOGNITION DAY POSTER WINNERS

MEDICAL RESIDENT BIOMEDICAL RESEARCH
1st place – Vanessa Oakes, DVM – VMCVM and VCOM VA

MEDICAL RESIDENT BIOMEDICAL RESEARCH
1st place – Vanessa Oakes, DVM – VMCVM and VCOM VA
CLINICAL RESEARCH BY FACULTY
1st place – Terry Hrubec, DVM, PhD – VCOM VA and VMCVM

VMCVM PHI ZETA CHAPTER MANUSCRIPT COMPETITION WINNERS

Basic Science Category: Bruno Menarim
Menarim, B.C., Gillis, K.H., Oliver, A., Mason, C., Werre, S.R., Luo, X., Byron, C.R., Kalbfleisch, T.S., MacLeod, J.N. and Dahlgren, L.A., 2020. Inflamed synovial fluid induces a homeostatic response in bone marrow mononuclear cells in vitro: Implications for joint therapy. The FASEB Journal, 34(3), pp.4430-4444.

Clinical Science Category: Nadia Saklou
Saklou, N.T., Burgess, B.A., Ashton, L.V., Morley, P.S. and Goehring, L.S., 2020. Environmental persistence of equid herpesvirus type-1. Equine Veterinary Journal.

These manuscripts will be sent to the national Phi Zeta Manuscript Competition as the representatives from our college. Congratulations to Drs. Saklou and Menarim!

2020 BMVS
DEFENSES

NAREE KETUSING
"Assessment of Foot and Mouth Disease (FMD) Control Polices and their Implementation in the Proposed FMD-Free Zone in Thailand"
Major Advisor: Drs. Valerie Ragan & Jennie Hodgson
Defense Date 02/25/2020

ANASTACIA DAVIS
"Preoperative Tibial Plateau Leveling Osteotomy Planning Using the Conventional and Common Tangent Methods: A Cadaveric Study"
Major Advisor: Dr. Lanz Otto
Defense Date: 05/11/2020

KAYLA WALER
"Aqueous humor concentration and prostaglandin E2 suppression efficacy of topically applied ophthalmic ketorolac 0.5% and diclofenac 0.1% solutions in dogs with cataract"
Major Advisor: Dr. Ian Herring
Defense Date: 05/13/2020

LAUREN BUTTLING
"Maternal Residential Proximity to Central Appalachian Surface Mining and Adverse Birth Outcomes"
Major Advisor: Dr. Julia Gohlke
Defense Date: 05/13/2020

JOHN SANDERS
"The anthelmintic effect of Bacillus thuringiensis Cry5B on Haemonchus contortus in sheep"
Major Advisor: Dr. Anne Zajac
Defense Date: 05/28/2020

CATHERINE "KATHY" BARRON
"Effects of Trimethylamine N-Oxide on Mouse Embryonic Stem Cells"
Major Advisor: Dr. Jia-Qiang He
Defense Date: 07/14/2020

AUDREY KEEBAUGH
"Evaluation of hemostasis in hyperthyroid cats"
Major Advisor: Stefanie Demonaco
Defense Date: 06/12/2020

JAMES BLAKE EVERETT
"Bone Marrow Mononuclear Cell for Equine Joint Disease"
Major Advisor: Dr. Linda Dahlgren
Defense Date: 07/15/2020

GIULIO MENCIOTTI
"Accuracy of Noninvasively Determined Pulmonary Artery Pressure in Dogs with Myxomatous Mitral Valve Disease"
Major Advisor: Dr. Michele Borgarelli
Defense Date: 07/17/2020

STEVEN GRANT WALDROP
"Rough leucine auxotrophic strains of Brucella expressing Salmonella flagellin C conjugated gonadotropins: an immunocontraceptive brucellosis vaccine for feral swine population control"
Major Advisor: Dr. Nammalwar Sriranganathan
Defense Date: 08/12/2020

BETSY SCHROEDER
"Finding Typhoid Mary: Identifying Latent Carriers of Salmonella enterica serovar Typhimurium"
Major Advisor: Dr. Nammalwar Sriranganathan
Defense Date: 08/14/2020

31ST ANNUAL RESEARCH SYMPOSIUM

March 25 12:30 to 5 pm
March 26 12:45 to 5 pm

Virtual Symposium hosted on Virginia Tech Canvas

Keynote Speakers

CORRIE BROWN

DVM, Ph.D., DAVP
Anatomic Pathoology, Josiah Meigs Distinguished Teaching Professor, University Professor
Department of Pathology
College of Veterinary Medicne
University of Georgia

ANNE SCHUCHAT

MD (RADM, USPHS, RET)
Principal Deputy Director
Center of Disease Control and Prevention (CDC)

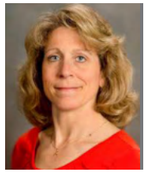
Our graduate symposium is graduate student-centric, which is strongly supported by the Office of Research and Graduate Studies. Each year to celebrate and recognize our graduate (MS and Ph.D.) students' progress/achievements, we host an annual Graduate research symposium. Information about previous symposia.

BMVS
SEMINARS

RESEARCH IN PROGRESS SEMINAR SERIES

The Research in Progress (RIP) Seminar Series not only serves as a platform for graduate students to share their research but includes presentations from invited content experts. The series is organized with a different research area each month.
The schedule includes three VMCVM internal speakers and one invited speaker per month. The series takes place on Wednesdays at 12:00 pm.
Monthly schedules are sent out via email. For a full seminar schedule, please visit the BMVS Seminar page. Please contact Andrea Green, BMVS graduate coordinator, for more information about the series.

Invited Speakers



DR. ALICIA COHEN

Director of Diversity Education Programs

Office of Inclusion and Diversity
Virginia Tech
Diversity Workshop
January 29th, 2020

DR. TIMOTHY FAN

Assistant Director for Shared Resources
Professor of Veterinary Clinical Medicine
University of Illinois at Urbana-Champaign
Resources
Professor of Veterinary Clinical Medicine

"The Role of Veterinary Medicine in Convergent Science- From Discovery to Impact"
30th Annual Research Symposium
November 6th, 2019

DR. STEVEN AUSTAD

Distinguished Professor
Chair of the Department of Biology
University of Alabama at Birmingham

"Methuselah's Zoo: what we can learn from the natural world about extending healthy life"
30th Annual Research Symposium
November 6th, 2019

DR. JESSICA AGNEW

PhD Candidate in Planning, Governance and Globalization (Urban Affairs and Planning); Master of Public Health

" Investigating the Ability of Low-Income Households in Mozambique to Increase the Diversity of Food Purchases Using Trials of Improved Practices"
February 19th, 2020

DR. JULIANNA PIEKNIK

FDA Staff Scientist

February 26th, 2020

Note: Invited speaker seminars cancelled in March to due COVID-19 and the University moving to online instruction for the remainder of the Spring 2020 semester.

PUBLICATIONS OF **2020 GRADUATES**

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Abstract# P35-01. 35th American Society for Virology Annual Meeting. June 18-22, 2016. Virginia Polytechnic Institute and State University, Blacksburg, VA.

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BIOMEDICAL AND VETERINARY SCIENCES
VIRGINIA TECH

EXTERNAL AWARDS

VALERIE RAGAN
Population Health Sciences

Training the Veterinary Public Practitiioner

USDA NIFA *Amount: $236,750*

MICHELLE THEUS

Biomedical Sciences and Pathobiology
Endothelial cell-specific regulations of Eph signaling in cerebrovascular asteriogenesis

NIH *Amount: $1,7,33,852*

STEPHEN SMITH (CO-I)
Biomedical Sciences and Pathobiology
Analyzing pathogenic Vibrio parahaemolyticus-oyster interactions to prevent human disease
(PI Ann Stevens, Biological Sciences)
NIH *Amount: $100,000*

CLAYTON CASWELL & COY ALLEN

Biomedical Sciences and Pathobiology

Development of an improved vaccine against Brucella abortus

NIH *Amount: $155,643*

JULIA GOHLKE

Population Health Sciences

Identifying the needs and options for recovery to work programs in Southwest Virginia

Ease Tennessee State University *Amount: $4,500*

COY ALLEN (CO-I)

Biomedical Sciences and Patholobiology

A Tissue Engineering Approach to Analyzing Host-Microbe Interactions in Cancer
(PI Scott Verbridge, BEAM}

NCI *Amount: $358,627*

COY ALLEN (CO-I)

Biomedical Sciences and Pathobiology

Nanoparticle-mediated Histotripsy (NMH) for Noninvasive and Targeted Ablation of Metastatic Breast Cancer
(PI Eli Vlaisavljevich, BEAM)
NIH *Amount: $206,619*

NIKOLAOS DERVISIS (CO-I)

Small Animal Clinical Sciences

Development and application of non-thermal high-frequency IRE to treat hepatic tumors
(PI Rafael Davalos, BEAM)
NIH *Amount: $2,220,260*

XIN LUO
Biomedical Sciences and Pathobiology

Selective HDAC6 inhibition deceases B cell activation in systemic lupus erythematosus

NIH *Amount: $466,545*

ANDREA BERTKE

Population Health Sciences

Viral manipulation of neuronal microRNAs to maintain trophic support and HSV latency

NIH Subaward *Amoun: $153,876*

CLAYTON CASWELL
Biomedical Sciences and Pathobiology

Characterizing the function and regulation of a conserved virulence-associated genetic pathway of pathogenic Alphaproteobacteria

NIH Subaward *Amount: $29,912*

COY ALLEN

Biomedical Sciences and Pathobiology

Defining mechanisms regulated by noncanonical NF-kB signaling that modulate eosinophilic esophagitis

University of Virginia *Amount: $37,880*

LIJUAN YUAN
Biomedical Sciences and Pathobiology

Preventing norovirus and Clostridium difficile gastroenteritis by engineered probiotic yeast Saccharomyces boulardii secreting multi-specific single-domain antibodies

NIH Subaward *Amount: $1,454,142*

KATHY HOSIG (CO-I)

Population Health Sciences

VHECO-Drug Court Impact
(PI Sarah Lyon-Hill, Economic Development)

University of Virginia *Amount: $ $98,645*

LIJUAN YUAN

Biomedical Sciences and Pathobiology
Immunogenicity and efficacy of thermostable rotavirus vaccine in gnotobiotic piglet model

Univeral Stabilization Technologies Inc *Amount: $362,250*

KEVIN LAHMERS

Biomedical Sciences and Pathobiology

Evaluation of automated nucleotide extraction in a lower volume diagnostic laboratory setting

USDA *Amount: $39,226*

JULIE GREEN
Biomedical Sciences and Pathobiology

VS Terminology Support Work Plan

USDA *Amount: $250,000*

JENNIFER DAVIS

Biomedical Sciences and Pathobiology

Food Animal Residue Avoidance Databank (FARAD) - VMCVM Component 2019

USDA *Amount: $150,000*

JENNIFER DAVIS (CO-I)
Biomedical Sciences and Pathobiology
Fundamental Studies on the Recovery of Rare Earth Elements from Coal and Coal Byproducts
(PI Roe-Hoan Yoon, Mining and Minerals Engineering)

US Department of Energy *Amount: $2,046,774*

XJ MENG

Biomedical Sciences and Pathobiology

A chicken model to study hepatitis E virus pathogenesis

NIH *Amount: $1,984,407*

COY ALLEN
Biomedical Sciences and Pathobiology

Employing Novel Porcine Models of Orthotopic Pancreatic Cancer to Evaluate Histotripsy Based Tumor Ablation Strategies

NIH *Amount: $427,815*

COY ALLEN (CO-I)

Biomedical Sciences and Pathobiology

Non-invasive Focused Ultrasound Ablation for the Treatment of Cholangiocarcinoma Liver Tumors
(PI Eli Vlaisavljevich, BEAM)

Focused Ultrasound Foundation *Amount: $138,616*

JAMIE STEWART
Large Animal Clinical Sciences

Efficacy of deslorelin acetate on induction of ovulation in does

The Theriogenology Foundation *Amount: $6,593*

COY ALLEN

Biomedical Sciences and Pathobiology

Development of Novel Porcine Models of Orthotopic Pancreatic Cancer for FUS and Histotripsy Tumor Ablation Applications

Focused Ultrasound Foundation *Amount: $100,000*

TIMOTHY BOLTON

Small Animal Clinical Sicnes

Pattern of thyroid function tests during recovery from acute nonthyroidal illness

American Kennel Club Canine Health Foundation *Amount: $13,792*

JAMIE STEWART

Large Animal Clinical Sciences

Developing Predictive Markers of Reproductive Soundness in Peri-pubertal and Mature Rams Throughout the Year

Virginia Agricultural Council *Amount: $13,556*

BRIANNA SWARTWOUT (MENTOR XIN LUO)
Biomedical Sciences and Pathobiology

Mechanisms of neonatal IgA production by Lactobacillus reuteri

NIH *Amount: $39,519*

CHRIS REILLY

Biomedical Sciences and Pathobiology

Proposal to test the effectiveness of a Bcl-6 inhibitor for the treatment of lupus nephritis

RILITE Foundation *Amount: $43,500*

DOMINIQUE SAWYERE HANSFORD
Small Animal Clinical Sciences

The Effect of a Modified Approach on Early Weight Bearing in Dogs Following a Tibial Plateau Leveling Osteotomy

American Kennel Club Canine Health Foundation *Amount: $14,939*

DOMINIQUE SAWYERE HANSFORD
Small Animal Clinical Sciences

Use of the Spatiotemporal and Kinetic Gait Variables for Differentiation of Spinal Ataxia and Bilateral Pelvic Limb Orthopedic Disease in Dogs

American Association of Rehabilitation Veterinarians *Amount: $2,500*

JOANNE TUOHY
Small Animal Clinical Sciences

Histotripsy for treatment of canine appendicular osteosarcoma

American Kennel Club Canine Health Foundation *Amount: $35,975*

STEFANIE DEMONACO
Department

Evaluation of flash glucose monitoring systems in diabetic cats

The Winn Feline Foundation *Amount: $15,333*

COY ALLEN (CO-I)
Biomedical Sciences and Pathobiology

Targeting the peptidoglycan cell wall of Borrelia burgdorferi to diagnose and treat Lyme disease
(PI Brandon Jutrus, Biochemistry)

Steven Alexandra Cohen Foundation *Amount: $561,216*

JOANNE TUOHY
Small Animal Clinical Sciences

Histotripsy for treatment of canine appendicular osteosarcoma

SHAWNA KLAHN
Focused Ultrasound Foundation *Amount: $144,107*

Small Animal Clinical Sciences
Investigation of the immunostimulatory response to mechanical high intensity focused ultrasound (histotripsy) in dogs with naturally-occurring soft tissue tumors

Focused Ultrasound Foundation *Amount: $162,460*

JOANNE TUOHY
Small Animal Clinical Sciences

Evaluation of High Frequency Irreversible Electroporation (H-FIRE) for treatment of canine insulinoma

ACVS *Amount: $8,600*

TOM CECERE
Biomedical Sciences and Pathobiology

Supplement to TEM Evaluation of iPSC-Derived Cells

Experimental Pathology Laboratories Inc *Amount: $27,461*

COY ALLEN
Biomedical Sciences and Pathobiology

Elucidating Mechanisms Modulated by NIK and Non-Canonical NF-kB Signaling In Colorectal Cancer

VCOM *Amount: $27,570*

DAVID XIE & TERRY HRUBEC
Biomedical Sciences and Pathobiology

Epitranscriptome Dynamics upon Neuronal Activation: Novel Clues for Autism Pathology and Treatment

VCOM *Amount: $50,000*

BLAISE COSTA & BRADLEY KLEIN
Biomedical Sciences and Pathobiology

To Study the Biology of Triheteromeric NMDA Receptor Modulators

VCOM *Amount: $49,994*

CHRIS REILLY & XIN LUO
Biomedical Sciences and Pathobiology

Microbiotic regulation of lupus nephritis

VCOM *Amount: $50,000*

KEVIN LAHMERS & PAWEL MICKALAK
Biomedical Sciences and Pathobiology

Genomic characterization of the invasive Longhorned tick and its microbiota including the known pathogen, Theileria orientalis

VCOM *Amount: $50,000*

BLAISE COSTA & BRADLEY KLEIN
Biomedical Sciences and Pathobiology

Clearance of Brain Metabolic Waste in a Natural Animal Model of Alzheimer's Disease by Cranial Osteopathic Manipulation

VCOM *Amount: $89,202*

COY ALLEN
Biomedical Sciences and Pathobiology

Task Order #17: Defining The Electrical Properties And Biological Impact Of Tumor Ablation Modalities For Use In The Prostate To Maximize Therapeutic Impact

AngioDynamics *Amount: $510,844*

LIJUAN YUAN
Biomedical Sciences and Pathobiology

A nanoparticle-based dual vaccine against norovirus and rotavirus

Cincinnati Childrens Hospital Medical Center *Amount: $50,000*

TOM CECERE
Biomedical Sciences and Pathobiology

TEM Evaluation of CNS from SN 1202-020

Experimental Pathology Laboratories Inc *Amount: $62,685*

VIRGINIA CORRIGAN
Small Animal Clinical Sciences

Effect of Pulsed Electromagnetic Field Therapy on Feline Osteoarthritic Pain: A Double-Blind, Randomized, Placebo-Controlled, Crossover Clinical Trial

Assisi Animal Health *Amount: $67,492*

KEVIN LAHMERS
iomedical Sciences and Pathobiology

Field evaluation of a rapid, mobile, novel sequencing technology for the detection of Equine Herpesvirus-1 in equine nasal secretions

American Quarter Horse Association *Amount: $80,036*

TOM CECERE

Biomedical Sciences and Pathobiology
Peripheral nerve practice samples for SN T05200

Experimental Pathology Laboratories Inc *Amount: $3,935*

RICHARD SHINN (MENTOR JOHN ROSSMEISL)

Small Animal Clinical Sciences

ACVIM Clinical Fellowship

American College of Veterinary Internal Medicine Foundation *Amount: $25,000*

TOM CECERE
Biomedical Sciences and Pathobiology

Peripheral Nerve Preparations for Study T05200

Experimental Pathology Laboratories Inc *Amount: $139,292*

S. A. AHMED

Office of Research and Graduate Studies
2020 Boehringer Ingelheim Scholars Program

Boehringer Ingelheim Vetmedica, Inc. *Amount: $10,000*

JAMES BROWN
Large Animal Clinical Sciences

Development of interactive three-dimensional models for the study of horse head vascular anatomy

Virginia Horse Industry Board *Amount: $18,100*

REBECCA FUNK

Large Animal Clinical Sciences

Seroprevalence of Anaplasma phagocytophilum in the equine population of Southwest Virginia

Virginia Horse Industry Board *Amount: $12,050.*

SHARON WITONSKY
Large Animal Clinical Sciences

Identifying the role for IL-17-a in EPM affected horses

Virginia Horse Industry Board *Amount: $6,700*

TOM CECERE

Biomedical Sciences and Pathobiology

TEM of mouse liver tissues from Study TB19-30

Experimental Pathology Laboratories Inc *Amount: $8,085*

ROBERT PLEASANT
Biomedical Sciences and Pathobiology

Genetic characterization of latent equine herpes virus-1 isolates in Virginia horses

Virginia Horse Industry Board *Amount: $6,720*

PAWEL MICHALAK

Biomedical Sciences and Pathobiology

Development and testing of environmental DNA protocols for detection of Yellowfin Madtom in Virginia

Virginia Department of Wildlife Resources *Amount:$20,000*

JAMES WEGER
Biomedical Sciences and Pathobiology

EAGER: Integrating Genotype, Phenotype, and Environment to Identify Biomarkers of Coronavirus Disease Severity and Transmission

NSF *Amount: $297,382*

SOPHIE WENZEL

Population Health Sciences

Region III East Suicide Prevention Plan

Blue Ridge Behavioral Healthcare *Amount: $5,000*

SOPHIE WENZEL
Population Health Sciences

Southside CSB needs assessment

Southside Community Services *Amount: $7,500*

KATHY HOSIG

Population Health Sciences

High Obesity Program: Empowering Healthy Lifestyles to Reduce Obesity in Petersburg, Virginia (EHLROP)

CDC *Amount: $1,555,000*

KATHY HOSIG (CO-I)
Population Health Sciences
Preventing and Reducing Opioid Misuse and Abuse in Rural Virginia
(PI Crystal Tyler, Mackey, Ag, Leadership & Community Education)
USDA NIFA *Amount: $324,841*

KATHY HOSIG (CO-I)

Population Health Sciences
Crisis Response and Harm Reduction: Combating Opioid Overdose through Community-level Intervention
(PI Mary Dunkenberger, Institute for Policy and Governance)

University of Baltimore *Amount: $299,456*

SOPHIE WENZEL
Population Health Sciences

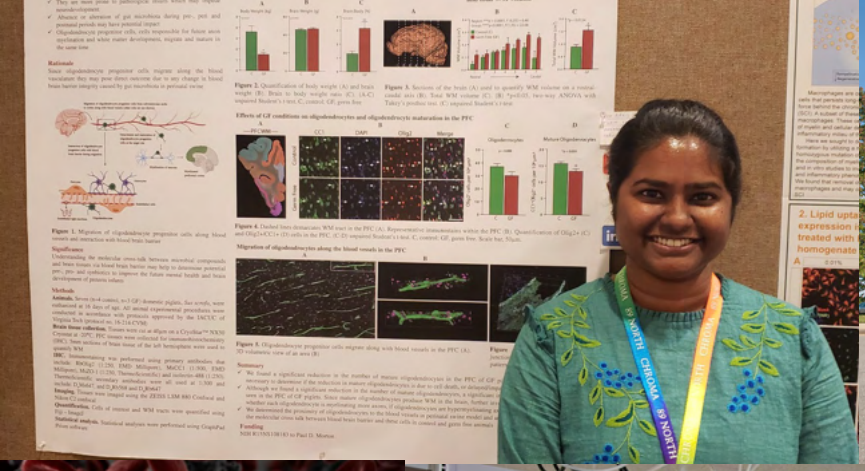
Roanoke Prevention Alliance resiliency collective evaluation and health disparities statement

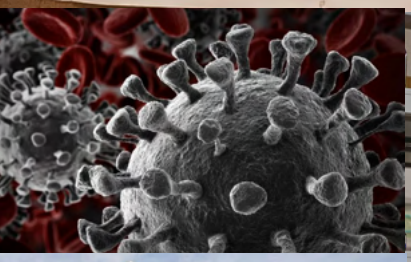
Blue Ridge Behavioral Healthcare *Amount: $2,000*

KATHY HOSIG (CO-I)
Popultation Health Science

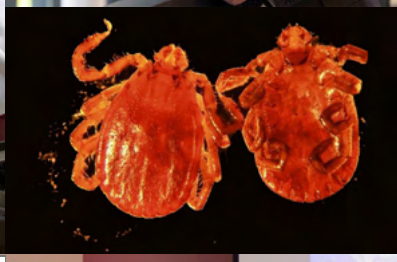
Regional Detox Messaging and Planning
(PI Mary Dunkenberger, Institute for Policy and Governance)

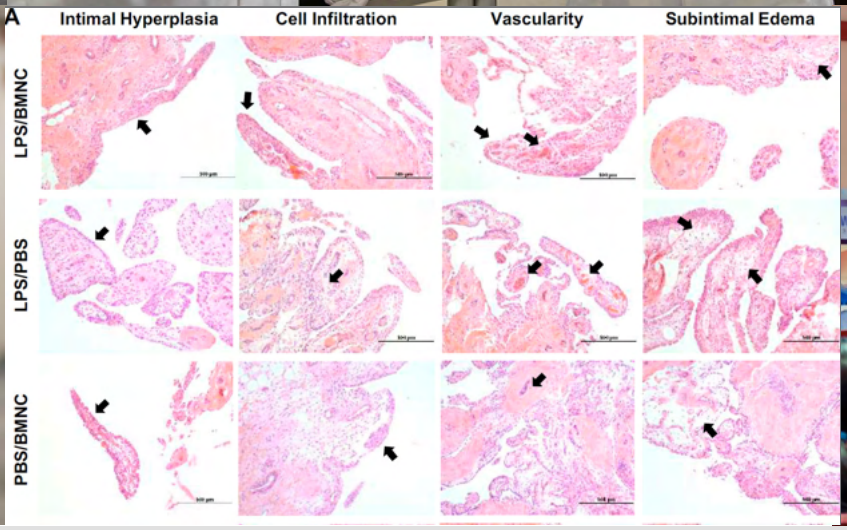
University of Virginia *Amount: $32,417*











OFFICE OF RESEARCH AND GRADUATE STUDIES

Virginia-Maryland College of Veterinary Medicine

VIRGINIA TECH

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