



University of Missouri

## College of Veterinary Medicine

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& EVENTSVetMed Projects Receive  
Mizzou Advantage Funds

Researchers at the University of Missouri College of Veterinary Medicine recently were awarded Mizzou Advantage grants for research projects in comparative medicine. The awards of up to \$25,000 each will facilitate teams working on research projects in taking their work to the next level. This fall, faculty and staff were invited to submit proposals for Mizzou Advantage funds. Forty requests were submitted, of those, 26 projects received funding. Three projects involving researchers at the College of Veterinary Medicine were selected for funding.

The goal of the Mizzou Advantage program is to increase MU's stature and impact. MU faculty and staff have formed networks to collaborate on projects in four strength areas: Food for the Future: The culture, economics and production of healthy, affordable food; Media of the Future: New ways to communicate, educate and market; One Health/One Medicine: The convergence of animal and human health; and Sustainable Energy: Developing and distributing renewable energy sources.

CVM projects receiving funding are:

**"Projects of Dogs and Men: Roots of Prostate Cancer"**

The principal investigator on the project is Jeff Bryan, DVM, PhD, associate professor of veterinary oncology. Collaborators on the project represent veterinary medicine, radiology, physics, bioinformatics, medical research and the MU Research Reactor.

According to Dr. Bryan's proposal, "This year 28,170 men will die of prostate cancer. While most cancers are defined by gene mutations that can be targeted, prostate cancer is not. Prostate cancer is driven by loss of normal control of gene expression. One mechanism, DNA methylation, silences critical genes controlling cell behavior and causes genes driving growth and invasion to be expressed. The challenge is finding the "drivers" of cancer among the "passenger" changes. Like men, companion dogs naturally develop prostate cancer, experience spread of the tumor, and die of the painful consequences. Identifying gene control changes in dogs that also exist in men will expose those that are most biologically relevant. The DNA methylation changes (methylome) and the resulting gene messages (transcriptome) will be sequenced simultaneously in man and dog. This will allow the identification of the critical changes common to both species."

**"Developing Canine Models of Neurodegenerative Disease"**

The principal investigator on the project is Dennis O'Brien, DVM, PhD, professor of veterinary neurology and Chancellor's Chair of Excellence in Comparative Neurology. Collaborators on the project represent veterinary medicine, veterinary pathology and animal science.

According to the proposal summary, "Hereditary neurologic diseases that affect people also occur in dogs. By applying whole genome sequencing techniques to the unique population structure of dog breeds, we have developed a gene discovery pipeline here at Mizzou that can efficiently identify the mutations responsible. Though hereditary forms of a disease such as Parkinson's disease may be rare compared to the common acquired disease, understanding the pathways involved in hereditary disease can provide insights into the cause of the selective neurodegeneration that occurs in Parkinson's disease. This project will bring together researchers at MU to apply that paradigm to a newly discovered mutation responsible for a hereditary movement disorder in dogs. If we can identify how the mutation leads to disease, it will open avenues for therapy in the dogs which can ultimately help humans with the disease as well."

**"Targeting Tumors Using a Combined Imaging Agent and Anticancer Drug"**

The project is a collaboration between Assistant Professor of Chemistry Mark Lee, PhD, and Associate Professor of Veterinary Oncology, Michael Lewis, PhD. The project summary describes their planned effort, "Over 1.6 million people are diagnosed with cancer each year in the United States, resulting in nearly 600,000 deaths. There is a tremendous unmet need for new anticancer agents that are both more potent and tumor selective. A new and promising approach to the treatment of cancer is the development of Image Guided Drug Delivery (IGDD), a form of therapy that can provide a real time validation and quantitation of the delivery of drugs to tumor tissue, while simultaneously measuring the therapeutic response. Funding of this proposal will combine existing areas of research on the MU campus to pursue IGDD projects. These efforts will utilize some of Mizzou's unique research strengths; existing small animal cancer models, radiopharmaceutical production at MURR, biomolecular imaging, and a family of potent anticancer agents developed on the MU campus."

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