

SPOTLIGHT ON Tufts University Veterinary Medicine

Advancing animal health and welfare through research

Clinical research at Cummings School of Veterinary Medicine

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doi.org/10.2460/ajvr.23.05.0098

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Comparative biomedical research, emerging diseases and one-health research, neurosciences, and clinical research are among the research strengths at Cummings School of Veterinary Medicine at Tufts University. With 6 academic hospitals and clinics and a diagnostic laboratory, Cummings School has a robust total clinical patient population of over 100,000 animals that supports more than 30 clinical trials and clinical investigations each year. Supported by the NIH, industry, nongovernment organizations, the USDA, and internal funds, clinical trials and investigations cover areas from comparative oncology to cardiology to COVID-19 to pinkeye in cattle. Many of these trials are collaborative, engaging human health researchers. We strive to capitalize on advances in human medicine to advance veterinary care and to capitalize on advances in veterinary medicine to accelerate new human drug development through proof-of-principle clinical trials in spontaneous animal diseases.

The success of the latter approach has led to the establishment of the PRE-medical Cancer Immunotherapy Network Canine Trials (PRECINCT), the first comparative oncology clinical trials network and a collaboration of 5 clinical research centers and the National Cancer Institute. Cheryl London, DVM, PhD, DACVIM (oncology), associate dean of research and graduate education, serves on the steering committee. The dual benefits of this type of work are already being seen, as new drugs and approaches are being discovered in both human and veterinary medicine.

Vicky Yang, DVM, PhD, DACVIM (cardiology), associate professor of cardiology, studies myxomatous mitral valve disease (MMVD) and cardiovascular toxicity associated with cancer treatment. Dr. Yang works closely with collaborators at Cummings School as well as with scientists, human cardiologists, oncologists, and immunologists as part of the Tufts Cardio-Oncology Multidisciplinary Research Group. This research team integrates scientific findings in 3 animal

models—rodents, dogs, and humans—to create a translational continuum and improve our understanding of cancer and cancer treatments.

MMVD is the most common acquired heart disease in dogs, and it affects 2% to 3% of people. As the exact genes responsible for MMVD development in both dogs and humans have been difficult to pinpoint, Dr. Yang is investigating the role of noncoding RNA in posttranscriptional regulation in hopes of finding and targeting common pathways downstream of heritable gene variations for MMVD disease control. Her interest in noncoding RNA and extracellular vesicle signaling extends into her studies of cardiovascular toxicity secondary to anticancer treatment in veterinary patients. These noncoding RNAs, especially in the context of their association with circulating extracellular vesicles, have the potential to serve as novel biomarkers for early detection of cardiovascular injury by anticancer drugs, which is currently lacking. Early detection of cardiac changes is a key for implementing cardioprotective therapies during the reversible phase of injury.

Dr. Yang, along with other members of our cardiology team, is also looking for other ways to prevent or delay the onset of MMVD. In collaboration with Rejuvenate Bio, a company that develops gene therapies for treating cardiac and metabolic diseases, they are looking at novel gene therapies for MMVD. This trial will help determine whether expression of growth factor β receptor 2 (sTGFBR2) and fibroblast growth factor 21 (FGF21) can help delay the progression of the disease by halting the degenerative changes in the mitral valve.

These are just a few examples of clinical research at Cummings School of Veterinary Medicine. Bringing basic discoveries to clinical research and collaborating with human health researchers create an environment for success that benefits animals and people.