

Canine Neurodegenerative Diseases: A Bridge from Bench to Health for Humans and their Companions.

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Spontaneous neurologic diseases are common in dogs and frequently there is a genetic predisposition. Advances in canine genomics and the nature of pure-bred dog populations make it possible to efficiently map and sequence the genes responsible. In contrast to transgenic rodent models, investigations into spontaneous canine disease start with a recognized disease process and work from there to the contribution of genetics to that disease. Thus there is never a question whether the findings will be relevant to real world disease since that is where we start. Once a disease has been characterized and the genes responsible identified, either the clinical population or a research colony can be utilized to investigate the pathogenesis of disease or to conduct therapeutic trials. The larger size and complexity of the brain in dogs compared with rodents can make the canine model more predictive of outcome in human trials in modalities such as gene, stem cell, or enzyme replacement therapies. The Comparative Neurology Program at the University of Missouri, College of Veterinary Medicine has applied this approach to identify the genes responsible for numerous developmental and degenerative diseases of the nervous system. These include seizures disorders, inborn errors of metabolism, amyotrophic lateral sclerosis, and parkinsonism; and we continue to identify new diseases regularly through our clinical practice and our relationship with other veterinary neurologist and neurosurgeons throughout the world.

We have partnered with industry and other institutions to translate these findings into improved diagnostic and therapeutic approaches that will improve both human and animal health.