

Looking at Baboons and Horses for Clues to Human Disease Process

Dianne McFarlane, DVM, Ph.D., ACVIM, ABVP, is an assistant professor with the Oklahoma State University (OSU) Center for Veterinary Health Sciences. McFarlane recently received a grant from the National Institutes of Health (NIH) to fund a comparative medicine research project.

The \$600,000 award was granted by the NIH's National Center for Research Resources (NCRR), through their Division of Comparative Medicine. The NCRR helps meet the needs of laboratory scientists and clinical researchers by providing environments and tools they need to understand, detect, treat and prevent a wide range of diseases. A main objective of the NCRR is to train veterinarians to conduct more comparative medical research because animals model humans closely.

McFarlane's study "Initiating Factors of Neurodegeneration" seeks to determine the underlying factors that are responsible for causing neurodegeneration. Age is the major risk factor for neurodegenerative diseases, such as Alzheimer's and Parkinson's disease. However, it is unknown what biological changes occur as we age that cause some but not all individuals to develop degenerative brain diseases.

"We will use a comparative approach, looking at two animal models," explains McFarlane. "We chose not to induce disease but rather to study natural occurring disease processes to determine what events initiate the degeneration of dopamine-producing neurons in the central nervous system of humans. These are the neurons that degenerate when someone is suffering from Parkinson's disease."

In collaboration with OSU College of Veterinary Medicine alumnus Dr. Gary White of the University of Oklahoma Health Sciences Center, McFarlane will investigate the aging process of baboons. Events that occur as part of natural aging in baboons will be characterized. Events and markers that predict severity of neurodegeneration will be identified.

The team will also study neurodegeneration in horses with Cushing's disease. This is a common endocrine disease that affects approximately 15% of old horses and ponies.

"In its late stage it is easily recognizable as the animals grow long, curly, hairy coats," says McFarlane.

Cushing's disease is caused by degeneration of dopamine-producing neurons, similar to what occurs in people with Parkinson's disease.

The team hopes that an understanding of the age-related events that contribute to development of equine Cushing's disease and baboon age-associated dopaminergic neurodegeneration may provide useful comparisons in unraveling the cause of Parkinson's disease.

The OSU Center for Veterinary Health Sciences currently has 13 NIH grants in effect funding a wide variety of research and training projects. The Veterinary Center leads the OSU system in funding from the National Institutes of Health.