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Zoonotic potential of chronic wasting disease prions from cervids

Chronic wasting disease (CWD) is the prion disease in cervids (mule deer, white-tailed deer, American elk, moose, and reindeer). It has become an epidemic in North America, and it has been detected in the Europe (Norway) since 2016. The widespread CWD and popular hunting and consumption of cervid meat and other products raise serious public health concerns, but questions remain on human susceptibility to CWD prions, especially on the potential difference in zoonotic potential among the various CWD prion strains. We have been working to address this critical question for well over a decade. We used CWD samples from various cervid species to inoculate transgenic mice expressing human or elk prion protein (PrP). We found infectious prions in the spleen or brain in a small fraction of CWD-inoculated transgenic mice expressing human PrP, indicating that humans are not completely resistant to CWD prions; this finding has significant ramifications on the

public health impact of CWD prions. The influence of cervid PrP polymorphisms, the prion strain dependence of CWD-to-human transmission barrier, and the characterization of experimental human CWD prions will be discussed.

Speaker Biography

Qingzhong Kong has completed his PhD from the University of Massachusetts at Amherst and Post-doctoral studies at Yale University. He is currently an Associate Professor of Pathology, Neurology and Regenerative Medicine. He has published over 50 original research papers in reputable journals (including *Science Translational Medicine*, *JCI*, *PNAS* and *Cell Reports*) and has been serving as an Editorial Board Member on seven scientific journals. He has multiple research interests, including public health risks of animal prions (CWD of cervids and atypical BSE of cattle), animal modeling of human prion diseases, mechanisms of prion replication and pathogenesis, etiology of sporadic Creutzfeldt-Jacob disease (CJD) in humans, normal cellular PrP in the biology and pathology of multiple brain and peripheral diseases, proteins responsible for the α -cleavage of cellular PrP, as well as gene therapy and DNA vaccination.

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