



It takes Tau to Tangle: Plaques, Tangles and Neurodegenerative Disease

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Professor Karen Duff

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Alzheimer's disease is the leading cause of dementia in the elderly with an incidence of 1:10 people over the age of 65, and 1:2 over the age of 85. The disease causes severe memory loss and dementia and ultimately leads to the death of the patient. It is defined pathologically by the presence in the brain of two lesions – extracellular amyloid plaques composed of a peptide called Abeta, and intracellular neurofibrillary tangles composed of an abnormal form of the protein Tau. The talk will discuss our current understanding of the role of these proteins in the disease process, and therapeutic approaches currently in preclinical, or clinical trials including the application of focused ultrasound for the delivery of drugs across the blood-brain barrier.

Dr. Karen Duff received her Ph.D from Sydney Brenner's department at the University of Cambridge (UK) in 1991. She has held positions at the University of South Florida in Tampa, Mayo Clinic Jacksonville, and the Nathan Kline Institute (NYU) in New York. In 2006 she moved to the Taub Institute at Columbia University and is a tenured Professor in the Pathology Department, with a joint position at the NYS Psychiatric Institute. The main focus of Dr. Duff's work is to examine mechanisms involved in the development of neurodegenerative diseases (Alzheimer's, Tauopathies etc) and to test therapeutic approaches that may attenuate disease progression. Over the last 20 years, Dr. Duff has used genetic engineering technology to create mouse models for AD that develop either plaques or tangles. The mice that form amyloid plaques have been especially well used to examine different aspects of AD, from the development of methods for MRI based diagnosis of amyloidosis, to understanding mechanisms by which the brain degenerates. In addition, the mouse models have been used to study how possible therapeutic strategies may help in the treatment, or prevention of AD. Currently, her main interests are in exploring how tangles form in the brain and therapeutic approaches to reduce their impact, and how AD is initiated in Late Onset AD. Dr. Duff has won several prizes for her work, including the Potamkin Prize In 2006. Her CV includes over 100 peer reviewed research articles and she is a regular speaker at scientific meetings around the world. Her work is mainly funded by the NIH and foundations.