Nov 12th, 4:00 PM - 5:00 PM

A New Look into an Old Problem: Implications of the Locus Coeruleus in Alzheimer's Disease

Tia Donaldson
University of New Mexico - Main Campus

The 2020 Shared Knowledge Conference

A New Look into an Old Problem: Implications of the Locus Coeruleus in Alzheimer's Disease

PRESENTED BY TIA DONALDSON, UNIVERSITY OF NEW MEXICO

ADDITIONAL AUTHOR:
BENJAMIN CLARK, UNIVERSITY OF NEW MEXICO

Video link: https://youtu.be/mUqh1TYne1U

Alzheimer's disease (AD), a progressive neurodegenerative disease, is one of the most common forms of dementia among the elderly. According to the Alzheimer's Association, approximately 5.7 million people within the United States are living with AD and this number is expected to rise to about 14 million by 2050. As the prevalence continues to rise, it is critical to understand how AD affects the brain. AD is identified by pathology in the brain which includes the formation of plaques and tangles. Most research focuses on mid-to-late stage AD when pathology and cognitive symptoms (e.g., memory decline) are at their peak. However, according to Braak staging which characterizes the progression of AD pathology throughout the brain, the locus coeruleus (LC) is one of the first regions to exhibit this pathology. The LC is a small cluster of neurons within the brainstem that are responsible for supplying the entire brain with norepinephrine. This neurotransmitter has been implicated in several cognitive processes including learning and memory. The LC sends projections to the hippocampus, which is the brain's main learning and memory center. The current study uses a transgenic rat model to explore the progression of AD pathology within the LC. We predict that pathology in the LC will lead to a deterioration of the norepinephrine rich projections to the hippocampus and thus create learning and memory deficits. Using fluorescent staining, plaques and tangles will be quantified in rats at various ages to measure the progression of the disease. Examining the relationship between the LC and AD pathology will provide us with a better understanding of AD and lead to more effective treatments for the memory impairments associated with the disease.