Tau pathology in the form of neurofibrillary tangles are a major hallmark of Alzheimer's disease. We have shown that tau pathology can propagate between cells (using microfluidic cultures) and spread from brain region to region (in a mouse model of early AD tauopathy). Pathology development is linked to cell dysfunction and degeneration but it shows selective vulnerability in terms of the cells that accumulate tangles. In humans (and a mouse model of the earliest stages of AD), tauopathy first develops in regions of the brain involved in spatial memory and tests of spatial memory linked to grid cell electrophysiology suggest cognitive games based region based deficits in spatial navigation that could be used to identify at risk people. Neuronal activity was shown to exacerbate tauopathy in vitro and in vivo. Both Abeta accumulation, and the expression of the ApoE4 variant were shown to increase neuronal activity which could explain their impact as risk facts.