There is an urgent need for animal models of Alzheimer’s disease (AD) to understand the underlying pathology and facilitate development and testing of novel treatments. Neurofibrillary tangles (NFT) which are composed of filamentous aggregates of the microtubule-associated protein Tau are identified as a hallmark of AD. Our previous studies have shown learning and memory deficits in Tau transgenic (Tg) mice that are consistent with the cognitive symptoms seen in AD patients. However, behavioural disturbances are the most important problems in the management of AD and are major determinants of nursing home placement. Common behavioural disturbances associated with AD are perseverative and depression-like behaviour, often co-occurring with increased agitation and aggression. Thus, we hypothesized that Tau Tg mice would demonstrate at least some abnormal behaviours, in addition to the cognitive impairments. We found that 6 months old THY-Tau22 mice, relative to wild-type littermates develop perseverative behaviours as seen in many AD-individuals. THY-Tau22 mice also displayed more stress-induced behavioural despair and aggression, consistent with the appearance of Tau aggregates in brain areas including the hippocampus and amygdala.