

P040 Axonal transport and behavioural defects in *Drosophila* expressing wild type and mutant tau
Amritpal Mudher¹, Francis Chee¹, Daniel Mackay², Simon Lovestone², Tracey Newman¹, David Shepherd¹.
¹ *School of Biological Sciences, University of Southampton, Southampton. U.K.*
² *Institute of Psychiatry, Kings College, London U.K.*

The tauopathies are a group of disorders that are characterised by abnormalities in the microtubule associated protein tau and include Alzheimer's Disease and Fronto-temporal dementias. These various tau protein abnormalities can include hyperphosphorylation, overexpression, aggregation and mutations. The biological mechanism(s) by which these tau protein abnormalities disrupt neuronal function is unclear and our lab is concerned with modelling some of these abnormalities in *Drosophila* so that the pathogenic consequences that ensue can be studied. We have previously demonstrated that overexpression of wild-type tau in *Drosophila* leads to neurodegeneration (Williams et al 2000), disruption of axonal transport, behavioural phenotype (Mudher et al 2004) and synaptic dysfunction (Chee et al 2004 *under review*). We have now generated transgenic *Drosophila* which express various mutant tau proteins and all of these *Drosophila* also exhibit all the axonal transport, behavioural and electrophysiological phenotypes that were seen in the wild type animals. This work demonstrates the usefulness of *Drosophila* in unravelling the biological mechanism(s) by which proteins implicated in human neurodegenerative diseases cause neuronal dysfunction and neuronal death.