Use of phosphorylated Tau as a biomarker

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Research question and background

Excessive phosphorylation of the microtubule-binding neuronal protein Tau characterizes neurodegenerative disorders collectively referred to as Tauopathies, one of which is Alzheimer's disease (AD). However the number of well characterized phosphorylation sites which also correlate with pathology is currently rather small and therefore their diagnostic utility limited. Valid and reliable biomarkers for diagnosing AD are a critical priority to disease detection in its earliest symptomatic stages because this is thought to improve treatment efficacy, hence impeding disease progression. Working with a Drosophila model of human Tauopathies, we have recently identified two novel putative phosphorylation sites on Tau and we have strong evidence that one of them differentiates neuronal toxicity from dysfunction. In this pre-clinical study, we propose to test and characterize novel phospho-specific antibodies that target these two sites and determine whether they can be used as clinically useful diagnostic tools for Tau-related pathologies.
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Methods and tissues

We have obtained tissue from NBB and we have performed immunohistochemistry of paraffin sections and Western blots with extracts of post-mortem samples from the hippocampus of non-demented controls, AD individuals and FTD patients.

Results and conclusion

The results we obtained are very encouraging because our antibody seems to be a promising diagnostic tool for differentiating non-demented controls from AD individuals and FTD patients. Our objective is to further clarify the diagnostic value of the antibody by analyzing a greater number of samples.