

It's all about tau

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Tau is a protein that is highly enriched in neurons and was originally defined by its ability to bind and stabilize microtubules. However, it is now becoming evident that the functions of tau extend beyond its ability to modulate microtubule dynamics. Tau plays a role in mediating axonal transport, synaptic structure and function, and neuronal signaling pathways. Although tau plays important physiological roles in neurons, its involvement in neurodegenerative diseases, and most prominently in the pathogenesis of Alzheimer disease (AD), has directed the majority of tau studies. However, a thorough knowledge of the physiological functions of tau and its post-translational modifications under normal conditions are necessary to provide the foundation for understanding its role in pathological settings. In this review, we will focus on human tau, summarizing tau structure and organization, as well as its posttranslational modifications associated with physiological processes. We will highlight possible mechanisms involved in mediating the turnover of tau and finally discuss newly elucidated tau functions in a physiological context. © 2018 Elsevier Ltd

Axonal transport

Dendrites

Microtubules

Posttranslational modifications

Tau

tau protein

ubiquitin

tau protein

alternative RNA splicing

Alzheimer disease

autophagy

glycation

human

isomerization

microtubule

mitochondrial dynamics

nerve fiber transport

nitration

oligodendroglia

physiological process

priority journal

protein cleavage

protein degradation

protein glycosylation

protein methylation

protein phosphorylation

protein processing

Review

signal transduction

stop codon

turnover rate

brain

chemistry

physiology

Brain

Humans

tau Proteins