Functional organization of tau proteins during neuronal differentiation and development.

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Tau proteins play major regulatory roles in the organization and integrity of the cytoskeletal network. In neurons, a specific axonal compartmentalization of tau has been shown. However, recent studies demonstrate that tau displays a widespread distribution in a variety of non-neuronal cell types. These proteins have been found in human fibroblasts and in several transformed cell lines. The heterogeneous family of tau is formed by a set of molecular species that share common peptide sequences. There is a single gene that contains several exons encoding for the six different tau isoforms in mammalian brain. Alternative splicing of a common RNA transcript as well as post-translational modifications contribute to its heterogeneity. Tau isoforms generated by splicing differ from one another by having either three or four repeats in their C-terminal half, and a variable number of inserts in their N-terminal moiety. These repeats have been shown to constitute microtubule-binding motifs. In t