Neurofibrillary tangles (NFTs) are abnormal aggregates of a protein called tau that accumulate inside the neurons of the brain, particularly in regions critical for learning, memory and other cognitive functions. The formation of NFTs is a hallmark of several neurodegenerative diseases, including Alzheimer's disease (AD), but they can also occur in other conditions like frontotemporal dementia.

Tau is a protein that is normally involved in the stabilization of the neuronal cytoskeleton and helps in the transport of nutrients along axons. In AD and other tauopathies, tau becomes hyperphosphorylated and forms insoluble aggregates that lead to the development of NFTs. These aggregates disrupt normal neuronal function and ultimately cause the death of the neuron.

The exact mechanism by which NFTs contribute to neurodegeneration is not completely understood, but it is thought that their presence disrupts the normal functioning of the neurons, leading to cell death and cognitive decline. NFTs are also thought to interact with other pathological changes in the brain, such as beta-amyloid plaques, to contribute to the development and progression of AD.

Several experimental therapies are being developed that target tau protein in an attempt to slow or halt the progression of neurodegeneration. These include drugs that aim to reduce the accumulation of tau in neurons, as well as treatments that stimulate the immune system to clear tau from the brain. However, much more research is needed to fully understand the complex mechanisms underlying NFT formation and their contribution to neurodegeneration.

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