Amyloid precursor protein (APP) is a large transmembrane protein that is found in many tissues, including the brain. APP is a precursor to the amyloid-beta (Aβ) protein, which is a key component of the beta-amyloid plaques that accumulate in the brains of individuals with Alzheimer's disease (AD).

APP is cleaved by enzymes in a complex series of steps, ultimately resulting in the production of Aβ. Under normal conditions, Aβ is cleared from the brain through various mechanisms, including degradation by enzymes and clearance by microglia and other immune cells. However, in AD, the clearance of Aβ is impaired, leading to its accumulation in the brain.

The role of APP in AD pathogenesis is not fully understood, but it is thought that abnormal processing of APP and the resulting accumulation of Aβ may play a key role in the development of the disease. Mutations in the APP gene have been linked to rare cases of familial AD, which typically have an earlier onset and more rapid progression than the more common sporadic form of the disease.

APP has also been implicated in other aspects of neuronal function and survival, including the regulation of synaptic activity, neurite outgrowth, and neuronal survival. Thus, APP is a complex protein with multiple functions, and its role in AD and other neurodegenerative diseases is an active area of research.

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