New Product Highlights

Secreted amyloid precursor proteins: Tools for Alzheimer's disease research

Alzheimer's disease (AD) is the most common dementia in Western societies with a gradual appearance of symptoms occurring between 60-70 years of age [1]. AD is characterized clinically by the progressive loss of cognitive function, and pathohistologically by the appearance in the brain of extracellular fibrillar amyloid deposits, referred to as plaques, and tau-rich neurofibrillary tangles.

Amyloid precursor protein (APP) is ubiquitously expressed in many tissues [2]. Following proteolytic cleavage by β- and γ-secretases, two fragments are formed: **secreted amyloid precursor protein β** (sAPPβ; Prod. No. **S 4316**) and **β-amyloid peptide** (Aβ; Prod. No. **A 9810**) [3]. Aβ is the major component of the amyloid plaques found in AD patients, while sAPPβ is thought to modulate neuronal function and cell survival [2].

Secreted amyloid precursor protein α (sAPPα; Prod. No. **S 9564**) is a 612 amino acid protein produced from the ubiquitously expressed APPβ, 695 isoform, following cleavage by α-secretase [2,4,5]. sAPPα is released from neurons in an activity-dependent manner and possesses neurotrophic activity that promotes long term neuronal survival [6]. sAPPα also promotes neurite outgrowth and synaptogenesis in addition to modulating neuronal excitability and synaptic plasticity [2,7]. In addition, it possesses pro-inflammatory activity by causing the release of excitotoxic levels of glutamate [7]. It potentially controls gene expression (i.e. NFκB expression) [2,8] and was recently identified as a ligand for the class A scavenger receptor [9].

In addition to the above secreted amyloid precursor proteins, Sigma-RBI is pleased to offer two sAPPα fragments. Specifically, **sAPPα (304-612)** (Prod. No. **S 8065**) is a fragment of sAPPα that lacks the N-terminal domain of the full length protein. The sAPPα (304-612) sequence comprises several functional domains. The RERMS peptide, APP (328-332), found in the region corresponding to sAPPα (319-335), is active in inducing fibroblast proliferation and neurite outgrowth in neuroblastoma cells [2,10]. The sequence corresponding to sAPPα (444-592) is linked to attenuation of glutamate excitotoxicity and to promotion of neurite outgrowth [2,11]. The C-terminal domain corresponding to sAPPα (597-612) acts as a heparin-binding domain [2]. Of particular interest, sAPPα (304-612) will enable the study of the biological effects of these domains without interference from the sAPPα N-terminal cysteine rich domain.

sAPPα (444-612) (Prod. No. **S 8190**) is a fragment of sAPPα that has been shown to attenuate glutamate excitotoxicity and to promote neurite outgrowth [2,11]. In addition, this fragment contains the sAPPα C-terminal domain (597-612) that acts as a heparin-binding domain [2]. sAPPα (444-612) enables the study of the biological effects of these domains without interference of the sAPPα N-terminal, cysteine-rich domain and the RERMS peptide domain.

These proteins and protein fragments will assist researchers in understanding the functional role of APP and its effects on neurodegeneration. They will be of particular interest to researchers studying the etiology of AD.

References

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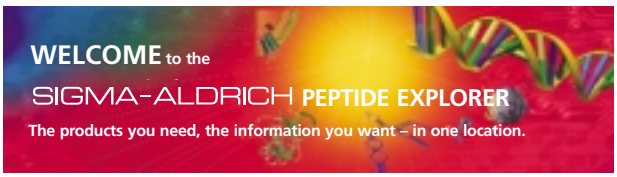

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