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Editorial

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Dementia and molecule of the month APP

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The progressive and relentless accumulation of amyloid beta (Abeta) protein in the brain is a key component of memory loss and dementia in Alzheimer's disease. This process also occurs and is considered a component of aging, HIV dementia, and other dementias. Abeta is processed from Amyloid precursor protein, APP. Under conditions still under investigation, anomalous Abeta protein fragments are produced that although initially soluble, become insoluble deposits during an oligomerization process. This progression affects neurons and glia (e.g. astrocytes) in the brain and results in the toxic effects that contribute to loss of cognitive performance. Therapies are being developed to reduce the production of toxic Abeta fragments from APP **[1, 2]**.

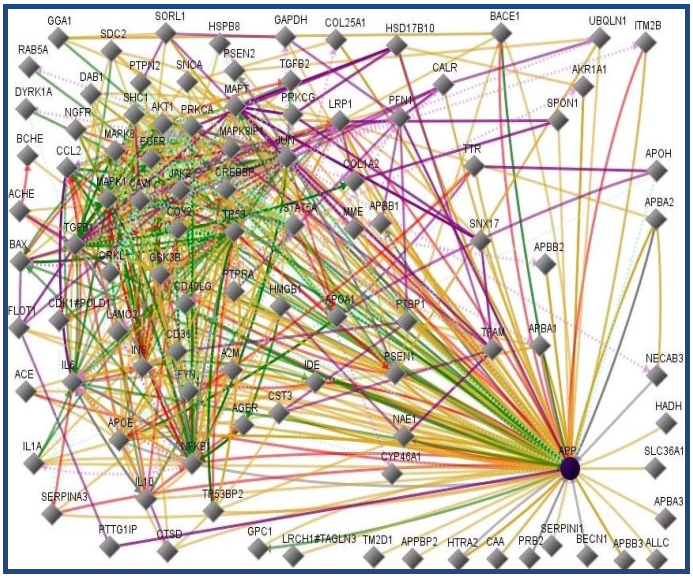

Figure 1: APP interactions. APP interactions with 99 other gene products are shown. In this figure, line-colors and various interactions with other genes are red Down-regulation, green Up-regulation, beige Regulation, purple Co-expression, brown Physical Interaction, turquoise dotted Predicted Protein Interaction, and mauve dotted Predicted TFactor Regulation. (GenePro SA Biosciences, http://www.sabiosciences.com/).

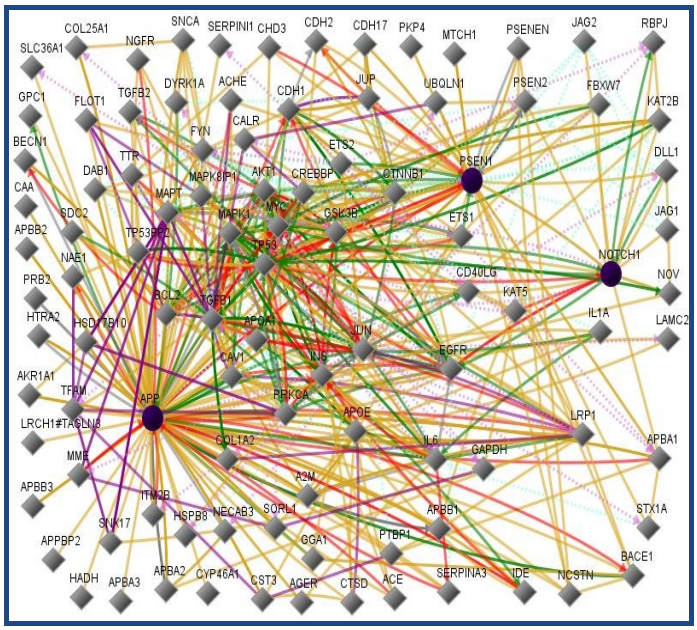

Figure 2: APP, NOTCH1, and PSEN1 interactions. APP, NOTCH1, and PSEN1 interactions with other gene products are shown. In this figure, line-colors and various interactions with other genes are red Down-regulation, green Up-regulation, beige Regulation, purple Co-expression, brown Physical Interaction, turquoise dotted Predicted Protein Interaction, and mauve dotted Predicted TFactor Regulation. (GenePro SA Biosciences, http://www.sabiosciences.com/).

Many proteins interact with APP and several proteins and their interactions are shown in **(Figure 1)** including APP amyloid beta (A4) precursor protein, BACE1 beta-site APP-cleaving enzyme 1, APBA1 amyloid beta (A4) precursor protein-binding, family A, member 1, APBA2 amyloid beta (A4) precursor protein-binding, family A, member 2, APBA3 amyloid beta (A4) precursor protein-binding, family A, member 3, APBB1 amyloid beta (A4) precursor protein-binding, family B, member 1 (Fe65), APBB2 amyloid beta (A4) precursor protein-binding, family B, member 2, APBB3 amyloid beta (A4) precursor protein-binding, family B, member 3, APPBP2 amyloid beta precursor protein (cytoplasmic tail) binding protein 2, PSEN1 presenilin 1, an enzyme that processes the APP, Lipid binding proteins APOE apolipoprotein E, APOA1 apolipoprotein A-I, Transcription factors CREBBP CREB binding protein, JUN jun proto-oncogene, JAK2 Janus kinase 2, STAT5A signal transducer and activator of transcription 5A.

Mutations in the genes for presenilin (PSEN) or APP cause familial Alzheimer's disease (FAD). Such mutations show increased production of amyloid β (Aβ) 42 oligopeptide compared to levels of Aβ40. These mutations may entail gain or loss of function mutations exhibited by the γ-secretase enzyme, of which PSENs are key components. NOTCH processing may be involved as well, especially in development. Thus, PSENs have multifactorial effects. **Figure 2** shows interactions and genes associated with APP, NOTCH1, and the protease PSEN1. Reactions and interactions such as these need great study, as they will lead to pinpointed mechanisms in the defeat of dementias involving APP **[3].**

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References:

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