Virginia Castillo

VIB SWITCH Lab
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BSc Biochemistry, Universitat Autònoma Barcelona, 2005
MSc Biomedicine, Biochemistry and Molecular Boilogy, Universitat Autònoma Barcelona, 2007
PhD Biomedicine, Biochemistry and Molecular Boilogy, Universitat Autònoma Barcelona, 2012

Current Position

Postdoctoral scientist in Biophysics and Cellular Biology at K.U. Leuven
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Current Project Members

Postdoctoral scientist: Virginia Castillo

Keywords

Alzheimer's disease – amyloid peptide – protein interactions – amyloid aggregation – neuronal toxicity

Science

Alzheimer's disease (AD) is a progressive neurodegenerative illness characterized by the accumulation of neuritic amyloid plaques in the brain. These plaques are principally composed by fibrillar aggregates of the amyloid-β peptide (Aβ); a peptide that is derived from the proteolytic cleavage of the amyloid protein precursor (APP); and which predominant forms are the 40 and 42 amino acid forms. Aβ42 has a higher tendency to self-aggregated into insoluble fibrils, and its production is increased in patients with familial AD (FAD). But the exact link between the Aβ pool and AD stills remains ambiguous.

Recently, monomeric and oligomeric Aβ species rather than Aβ plaques have been considered to be toxic, causing synaptic dysfunction or loss before plaque appears. It has been related that extracellular Aβ suppresses synaptic transmission by interacting with surface receptors including nicotinic acetylcholine and glutamate receptors. However, intracellular Aβ seems to be a prerequisite for its secretion from neurons and is considered as one of the early pathological events in AD.

These evidences indicate that as with extracellular Aβ, intracellular species may interfere with channels and receptors regulating neuronal synapses, explaining why extracellular amyloid plaques typically contain a wide range of intracellular proteins.

Using multidisciplinary approaches, this research aims to study new interactions of the intracellular Aβ pool with neuronal intracellular components and its biological implications.

Recent Fellowships

K.U. Leuven – F+ Fellowship for postdoctoral researchers
Period: 15.09.2013 – 31.12.2013
Title: Of passengers and drivers: searching for aggregating proteins in tumor cells
Role: Postdoctoral researcher

Research Foundation Flanders (FWO) – Pegasus Postdoctoral Fellowship
Period: 01.01.2014 – 14.06.2014

Title: Of passengers and drivers: searching for aggregating proteins in tumor cells
Role: Postdoctoral researcher

European Commission Marie Curie FP7 People Cofund - omics@vib - VIB International Postdoc Program
Period: 15.06.2014 – 14.06.2017
Title: Of passengers and drivers: searching for aggregating proteins in tumor cells
Role: Postdoctoral researcher

Selected Publications

Castillo V, Chiti F and Ventura S. The N-terminal helix controls the transition between the soluble and amyloid states of an FF domain. *PLoS One (*2013) 8(3):e58297. PMID: 23505482.

Castillo V, Graña-Montes R, Ventura S. The aggregation properties of Escherichia coli proteins associated with their cellular abundance. *Biotechnol. J.* (2011) 6(6):752-60. PMID: 21538899.

Castillo V, Espargaró A, Gordo V, Vendrell J, Ventura S. Deciphering the role of the thermodynamic and kinetic stabilities of SH3 domains on their aggregation inside bacteria. *Proteomics.* (2010) 10(23):4172-85. PMID: 21086517.

Castillo V, Ventura S. Amyloidogenic regions and interaction surfaces overlap in globular proteins related to conformational diseases. *PLoS Comput Biol* (2009) 5(8):e1000476. PMID: 19696882.