Biophysical studies of the amyloid beta peptide – structure conversion, aggregation pathways and molecular interactions

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Country

Sweden

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Biophysical studies of the amyloid beta peptide - structure conversion, aggregation pathways and molecular interactions

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€ 228,509

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3

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Research Abstract

The aim of my research is to increase the basic knowledge of the molecular structure conversions and kinetic processes that are involved in amyloid formation. The Amyloid beta (Abeta) peptide is related to the pathological processes associated with Alzheimer´s disease, which belongs to the family of protein/peptide misfolding (amyloid) diseases. My research plan concerns studies of the 40 and 42 residues long Abeta peptides: secondary structure

conversions (formation of oligomeric states) as well as aggregation kinetics and endpoints. The effects of certain metal ions, such as Cu(II), Zn(II), and Fe(II) and Fe(III), as well as selected biomembrane mimetics, such as phospholipid vesicles, on the processes will be studied. I will also study effects of selected small molecules, and short cyclic and linear peptides, which are believed or known to interfere with the aggregation processes, to provide a molecular basis for development of new therapeutic strategies. The linear peptides are new constructs based on our previous studies of anti-prion peptides and their restoring effects on prion infected cells. My biophysical methods are spectroscopic (mainly high resolution NMR and circular dichroism) and kinetic (fluorescence). I will also cooperate with other scientists who have access to biological model systems (mainly based on neuronal cells) for disease, for a potential correlation of my biophysical observations with biological effects observed in their model systems.

Further information available at:

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Investments < €500k

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