The molecular determinants of the aggregation and toxicity of peptides and proteins

Title of project or programme

Title of PI The molecular determinants of the aggregation and toxicity of peptides and proteins

Principal Investigators of project/programme grant

Title	Forname	Surname	Institution	Country
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- United Kingdom

Source of funding information

Medical Research Council

Total sum awarded (Euro)

1826882.79

Start date of award

01-03-2008

Total duration of award in months

60

The project/programme is most relevant to

- Alzheimer's disease and other dementias
- Neurodegenerative disease in general

Keywords
Research abstract in English

This proposal brings together a group of people with a wide range of skills from the Departments of Chemistry, Physics, Nanoscience, Genetics and Medicine to investigate the fundamental causes of a range of diseases that are caused by protein misfolding and aggregation. Our project is based on

three key advances that have occurred in Cambridge, the first is the understanding that the potential to form amyloid fibrils is a common, if not fundamental, property of all proteins. The second is the discovery that we can accurately predict the aggregation propensity of proteins knowing only their amino acid sequences. The third advance has been the development of Drosophila models of protein aggregation diseases. We will focus on understanding the fundamental mechanisms that underlie a range of protein misfolding disorders and use our range of skills to carefully observe protein aggregation in the test tube, interpret the data using sophisticated computer algorithms and use Drosophila model systems to provide further insights into pathological significance. We will extend our preliminary studies on the Abeta peptide and investigate other proteins implicated in neurological disorders and so formulate a quantitative model that describes the molecular determinants of peptide and protein aggregation and toxicity. Such a powerful understanding of fundamental disease mechanisms will provide us with new opportunities and strategies for therapeutic intervention.

Lay summary
In which category does this research fall?

- Basic research