

The Role of Non-coding RNA in Protein Networks and Neurodegenerative Diseases

<https://neurodegenerationresearch.eu/survey/the-role-of-non-coding-rna-in-protein-networks-and-neurodegenerative-diseases/>

Principal Investigators

Institution

Contact information of lead PI

Country

European Commission

Title of project or programme

The Role of Non-coding RNA in Protein Networks and Neurodegenerative Diseases

Source of funding information

European Commission FP7-Seventh Framework Programme

Total sum awarded (Euro)

€ 1,465,351

Start date of award

01/01/2013

Total duration of award in years

5.0

The project/programme is most relevant to:

Neurodegenerative disease in general

Keywords

Research Abstract

A major portion of the eukaryotic genome is occupied by DNA sequences whose transcripts do not code for proteins. This part of the genome is transcribed in a developmentally regulated manner and in response to external stimuli to produce large numbers of long non-coding RNAs (lncRNAs). From the beginning of transcription through splicing and translation, RNA molecules are associated with numerous RNA binding proteins that regulate their processing, stability, transport and translation. Both coding and non-coding RNAs and their associated binding proteins are involved in numerous cellular pathways. These pathways, which include RNA processing and the regulation of transcription and translation, are critical determinants of neuronal differentiation and plasticity. Alterations in these pathways have been identified to contribute to a wide variety of neurodegenerative diseases. Mutations in two RNA binding

proteins involved in RNA splicing, the Tar DNA binding protein of 43kd (TDP-43) and Fused in Sarcoma (FUS), cause amyloid aggregation and are associated with Amyotrophic Lateral Sclerosis (ALS). My main interest is to understand the role played by RNA molecules in protein networks. Characterizing protein-RNA associations is key to unravel the complexity and functionality of mammalian genomes. In this project, I propose to study associations of lncRNAs with proteins involved in i) transcriptional regulation and epigenetics (such as polymerases, transcription factors and chromatin-modifiers) and ii) neurodegenerative diseases (such as Parkinson's α -synuclein, Alzheimer's disease amyloid protein APP, TDP-43 and FUS). In particular, I will investigate if RNA molecules are involved in regulatory mechanisms that control protein production and prevent formation of toxic aggregates. In a multidisciplinary effort, I aim to discover protein-RNA interactions using advanced computational methods developed in my group and state of the art experimental techniques.

Lay Summary

Further information available at:

Types:

Investments > €500k

Member States:

European Commission

Diseases:

Neurodegenerative disease in general

Years:

2016

Database Categories:

N/A

Database Tags:

N/A