Christina Athanasiou (ESR 4)

Modelling of mechanistic effects of neurotrophin modulators

Profile

Christina Athanasiou
christina.athanasiou@h-its.org

Host:

Heidelberg Institute for Theoretical Studies, Germany

Social

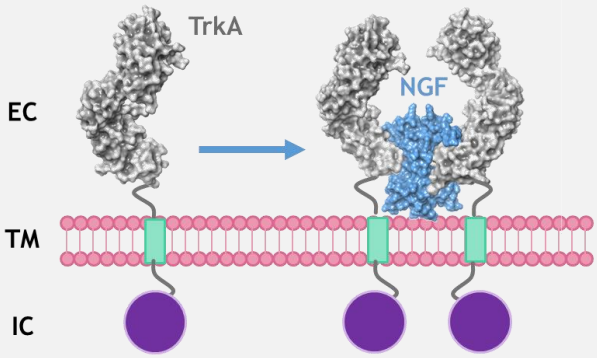
Twitter: @eneurotrophin

Group: EuroNeurotrophin

Project: EuroNeurotrophin

My Research

My research project is the investigation of the mechanism of action of neurotrophin small molecule mimetics and potentiators, through the use of molecular simulations and mathematical modelling techniques. My study will provide a basis for the optimisation of neurotrophin modulators and for the experimental investigation of their mechanisms. I will also study the interactions between neurotrophin mimetics and their receptors, as well as conformational changes and allosteric effects caused by the small molecules.



- Molecular simulations
- Mechanistic studies
- Conformational changes
- Allosteric effects
- Mathematical modelling

Scientific CV

- September 2018 – Present: EuroNeurotrophin Early Stage Researcher PhD student, Heidelberg Institute for Theoretical Studies (HITS) & Heidelberg University, Germany.
- February 2017 – June 2018: Research project, Biomedical Research Foundation of Academy of Athens (BRFAA), Greece.
- September 2011 – February 2017: Diploma in Chemical Engineering, National Technical University of Athens (NTUA), Greece.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 765704

EuroNeurotrophin

A European training network for the discovery of neurotrophins small molecule mimetics as candidate therapeutic agents for neurodegeneration and neuroinflammation

Project Coordinator

Dr Theodora Calogeropoulou,
National Hellenic Research Foundation, Greece

Project Partners

ΕΘΝΙΚΟ ΙΔΡΥΜΑ ΕΡΕΥΝΩΝ
National Hellenic Research Foundation

Heidelberg Institute for Theoretical Studies
HITS

UNIVERSITÀ DI SIENA
1240

UNIVERSITÉ CAEN NORMANDIE

HELLENIC REPUBLIC
National and Kapodistrian University of Athens

TECHNISCHE UNIVERSITÄT DRESDEN

FORTH
Foundation for Research & Technology - Hellas

The University Of Sheffield.

VU VRIJE UNIVERSITEIT AMSTERDAM

Project Contact

info@euroneurotrophin.eu
www.euroneurotrophin.eu

Introduction

Neurodegenerative diseases like Alzheimer's disease or Parkinson's disease are on the rise in developed societies worldwide affecting millions of people. Neurodegenerative diseases primarily affect neurons in the human brain and currently there exists no cure for any of them since most of the available drugs fail to tackle the pathogenesis of neurodegenerative diseases.

Preclinical studies point to the therapeutic potential of neurotrophins, which have been shown to control a number of aspects of survival, development and function of neurons. However, the poor pharmacokinetic properties of neurotrophins render their use as drugs prohibitive.

Objectives

EuroNeurotrophin will address the major limitations of neurotrophins by developing novel small molecule, neurotrophin mimetics with favourable profiles of stability, tissue penetration and targeted biological actions. In the long term, the project will contribute to the further development of small molecule therapeutics for the treatment of neurodegenerative diseases and neuroinflammation, revealing new concepts of neurotrophin receptors signalling and to create a pan-European Neurotrophin Network.

Furthermore, EuroNeurotrophin aims at creating a new generation of young scientists with a broad understanding and skill set in chemical biology with emphasis on the neuroscience field and to educate 14 young researchers regarding the knowledge underpinning the neurotrophin related field as well as on drug and natural products research for neurodegenerative diseases.

Impact

Neurotrophins offer one of the most compelling opportunities to significantly improve the treatment of serious age-related, neurological diseases such as Alzheimer's, Parkinson's, MND/ALS. A major therapeutic advantage of neurotrophic factors is that they tackle both the symptoms of a disease (improving clinical status) as well as its pathogenesis (delaying disease progression) without any prerequisite deep insight into the aetiology or specific pathogenic variables driving the disease process.

We will study neurotrophin small molecule mimetics (synthetic or natural) in depth, and will use them as molecular probes to interrogate the role of neurotrophins and their receptors. It will contribute important new knowledge to the next frontier in biomedical sciences.

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 765704