



# Paolo Giaccio (ESR 7)

## Isolation of new natural neurotrophin mimetics from marine microorganisms

### Profile

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### Host:

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### Social

Twitter: @eneurotrophin



Group: EuroNeurotrophin

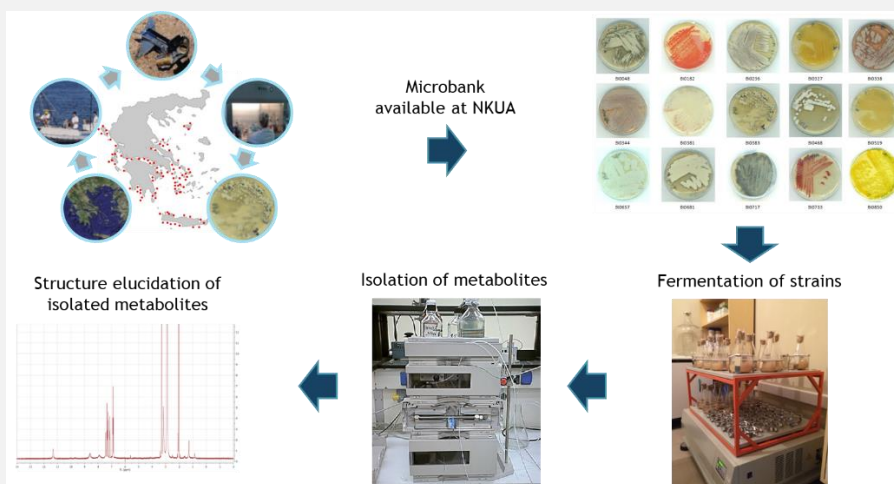
Project: EuroNeurotrophin

### My Research

The aim of my research is the isolation of natural products from marine bacteria and/or fungi from the East Mediterranean basin that act as mimetics of neurotrophins using a bioassay-guided isolation protocol.

The procedure includes:

- small-scale fermentation of existing strains from the MicroBank available at NKUA and preparation of extracts that will be tested for neuroprotective activity using HTS facilities at USFD,
- large-scale fermentation of strains exhibiting positive hits and fractionation of extracts thereof to crude fractions according to polarity, which will be subjected to another round of HTS facilities at USFD,
- chromatographic separations of fractions exhibiting positive hits using normal and reversed phase liquid chromatography so as to obtain secondary metabolites in pure form to be evaluated for their bioactivity as neurotrophin mimetics,
- comprehensive spectroscopic (1D and 2D NMR, UV, IR) and spectrometric (HR-MS and MS<sup>n</sup>) analyses for the structure elucidation of the isolated metabolites.



### Scientific CV

- 2018: EuroNeurotrophin Early Stage Researcher, PhD student at the Section of Pharmacognosy and Chemistry of Natural Products, Department of Pharmacy, National and Kapodistrian University of Athens, Greece.
- 2018: Postgraduate fellowship in Natural Products and their derivatizations at the Italian National Research Council (CNR), Italy.
- 2017: M.Sc. in Pharmaceutical Chemistry, University of Naples "Federico II", Italy. Thesis in Organic Chemistry: Design, synthesis and biological evaluation of novel FXR ligands.





# 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  
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## Project Partners



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National Hellenic Research Foundation

Heidelberg Institute for  
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## Project Contact

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## 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.

