



# Alessia Latorrata (ESR 2)

## Synthesis of dehydroepiandrosterone (DHEA) derivatives substituted by three membered-17-spiro substituents

### Profile

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### Host:



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### Social

Twitter: @eneurotrophin



Group: EuroNeurotrophin



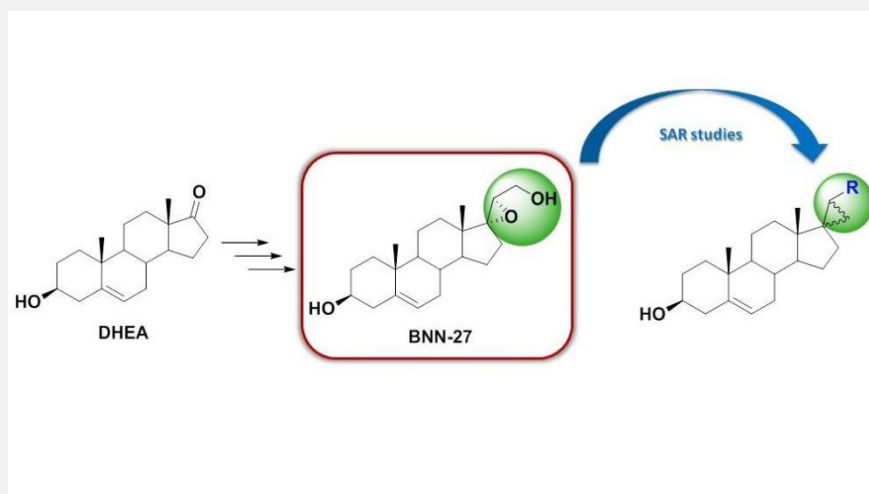
Project: EuroNeurotrophin



### My Research

My research project will be focused on synthesis, purification and characterization of chiral 17-spiro DHEA derivatives bearing three-membered rings, which will be further elaborated to introduce pharmacophore groups, using asymmetric organocatalysis, biomimetic approaches and other synthetic methodologies. I will probe the stereoelectronic requirements for optimum neuroprotective activity, obtaining Structure-Activity-Relationships for 17-spiro-DHEA derivatives agonists of the neurotrophin receptors. My project also focuses to analyse SNAP PK data on lead compound(s) and to label steroidal neurotrophin mimetics with fluorophores or NIR-dyes.

I will dock my synthetic compounds on the neurotrophin receptors at HITS, I will study the fluorescently labelled compounds with live imaging techniques at TUD and I will be familiarised with neuroproteomics at VUA.



### Scientific CV

- **September 2018 – present:** EuroNeurotrophin Early Stage Researcher PhD student at National Hellenic Research Foundation and enrolment at National and Kapodistrian University of Athens.
- **March 2018:** II level Master course in “Drug design and synthesis” at the University of Pavia, Italy (postgraduate specialization).
- **October 2017 – March 2018:** Traineeship at the University of Hamburg in Organic and Pharmaceutical synthesis. Thesis title: “Synthesis of Proline-based Hydroxamic acids as inhibitors of Zn<sup>2+</sup>- dependent enzymes”.
- **February 2017 – September 2017:** Research fellow at the IRCCS-ASMN, Reggio Emilia, Italy.
- **October 2015 - April 2016:** Master’s Thesis in pharmaceutical and organic chemistry at the Northumbria University, Newcastle Upon Tyne, UK. Name of the Thesis: “Synthesis of metal chelators against neurodegenerative diseases”.
- **May 2016:** Master’s degree in Medicinal Chemistry at the University of Parma, Italy.





### Project Coordinator

Dr Theodora Calogeropoulou,  
National Hellenic Research  
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### Project Partners



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

### 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.

