Mirjana Antonijevic (ESR 6)

In silico screening and Hit to lead development of small molecules neurotrophin receptors ligands

Profile

Mirjana Antonijevic
mirjana.antonijevic@unicaen.fr

Host:

Université de Caen Normandie, UFR Santé - Faculté des Sciences Pharmaceutiques, Centre d'Etudes et de Recherche sur le médicament de Normandie, France

Supervisor:

Prof. Christophe Rochais
Professor of Organic Chemistry
UFR Santé - Faculté des Sciences Pharmaceutiques, Centre d'Etudes et de Recherche sur le médicament de Normandie

Social

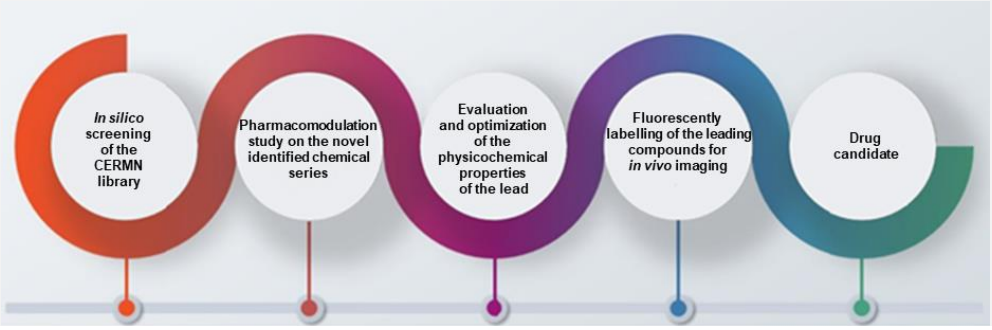
Twitter: @M_Antonijevic_

LinkedIn: Mirjana Antonijevic

Project: EuroNeurotrophin

My Research

To identify hit molecules as ligands for neurotrophin receptors, we will perform *in silico* screening of CERMN chemical library. *In silico* data will be evaluated along with high-throughput screening of the before mentioned chemical library. Selected hit molecules will be subjected to the study of the hit to lead optimization, to better understand the molecular patterns involved in target-ligand interactions. Additionally, these studies will be expanded by the physicochemical optimization of the selected hit compounds. The final lead compounds will be fluorescently labelled for *in vivo* bioimaging studies.



Scientific CV

- 2018-present: **PhD in Chemoinformatics and Medicinal Chemistry,** University of Caen, Caen "*In silico* screening and Hit to lead development of small molecules neurotrophin receptors ligands". ***ESR at EuroNeurotrophin project***
- 2017-2018: **Professional Associate,** Department of Pharmaceutical chemistry, Faculty of Pharmacy, University of Belgrade, Belgrade
- 2012-2017: **Master of Pharmacy**, Faculty of Pharmacy, University of Belgrade, Belgrade *Master thesis*: "3D-QSAR study, design of serotonin 5-HT_{2A} receptor antagonists and *in vitro* testing of the blood-brain barrier permeation of selected antipsychotics", supervised by Prof. Katarina Nikolic.

Publication:

- **Antonijević, M.**, Nikolić, K., Vučićević, J., Oljačić, S. and Agbaba, D. (2017). 3D- QSAR modeling and pharmacophore study of serotonin 5-HT_{2A} receptors antagonists. Arh.farm. 2017;67: 233 – 247.

Poster presentations:

- 2018 *Combined ligand and structure- based approach in search of 5-HT_{2A} receptor agonists and antagonists* K. Nikolic, **M. Antonijevic**, M. Radan, D. Agbaba, T. Djikic. 11th FENS Forum of Neuroscience, Berlin, 7-11 July, 2018.
- 2019 *In silico screening and Hit to lead development of small molecules neurotrophin receptors ligands* **M. Antonijevic**, R. Bureau, P. Dallemagne, C. Rochais. 26th Young Research Fellow Meeting, Paris, 20-22 February, 2019.
- 2019 *In silico screening and development of small molecules neurotrophin receptors ligands* **M. Antonijevic**, R. Bureau, P. Dallemagne, C. Rochais. 27th Annual GP2A Medicinal Chemistry Conference, Nottingham, 21-23 August 2019 – best poster award.

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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.

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