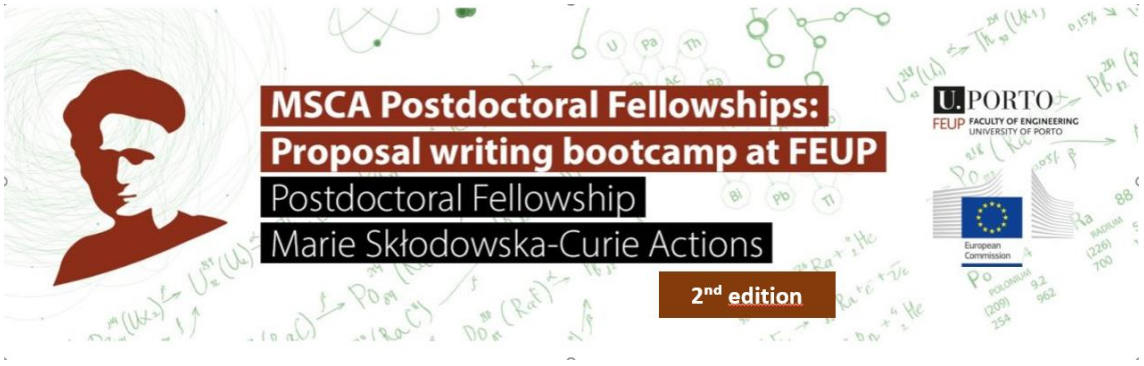


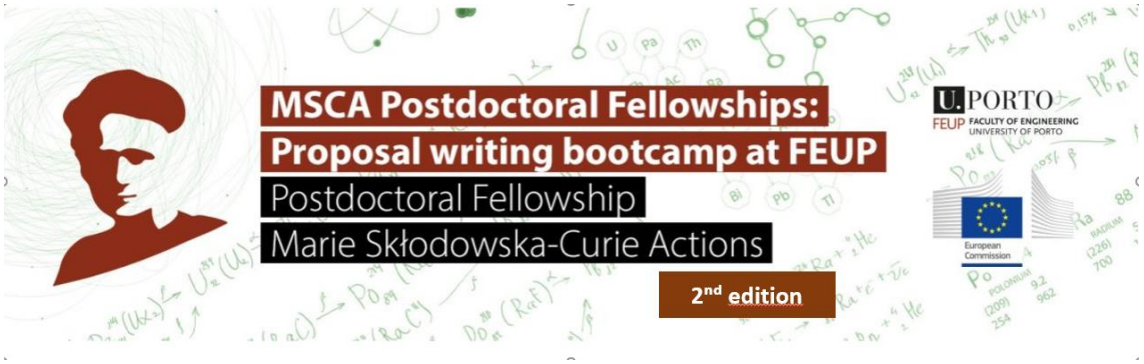
SUPERVISOR INFORMATION	
First and Last name	Joana Loureiro
URL of supervisor webpage	https://sigarra.up.pt/feup/pt/FUNC_GERAL.FORMVIEW?p_codigo=470541
Department	Department of Mechanical Engineering
Field(s) of research	Nanotechnology; Biomaterials
PROJECT PROPOSAL	
Title (optional)	Novel protein-based nanoparticles to transport commercially available drugs to the brain for the treatment of Alzheimer's Disease

Brief project description

Alzheimer´s Disease is a form of dementia with a high impact worldwide, accounting for more than 46 million cases. With the growth of mean life expectancy, it is predictable that this number will increase to 66 million by 2030, 81.1 million by 2040 and 140 million by 2050. Then, Alzheimer's disease is expected to continue to be a clinical, social and economic problem for a long time. So, the continuous increase in Alzheimer's incidence demands an urgent development of effective therapeutic strategies. Currently, a few drugs are on the market to attenuate the disease symptoms. However, side effects associated with those medicines could include the risk of diabetes, liver problems, depression, vomiting, and headache, among others. Those side effects are related to the lack of specificity of the drug, leading to increased levels of this medication in the periphery compared to the brain.
To overcome this limitation, the present work proposes to produce nanoparticles with the ability to target the brain, as a drug delivery system for those drugs. The nanoparticles will be produced with molecules recognized by specific receptors overexpressed in the brain, which allows the nanoparticle to be directed to the brain and help cross the blood-brain barrier (BBB).

The objectives of this work include:
O.1: The selection of appropriate/reproducible methodology to produce protein-based nanoparticles
O.2: The production and in vitro characterization of reproducible protein-based nanoparticles containing drug models
O.3: The evaluation of the in vitro efficacy of the nanocarrier to target the brain
O.3: The evaluation of the in vivo efficacy of the nanocarrier to target the brain

At the end of the Project, it is expected to have a stable nanoformulation of protein-based nanoparticles with the ability to transport drugs to treat Alzheimer's disease symptoms to the brain.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