



CARTHAGO - Marie Curie Innovative Training Network

Application Deadline: October 25, 2020 (23h59 GMT+2)

Job Description: PhD Position aiming at the Design of dendrimer-based vectors for nucleic acid delivery to cartilaginous tissues of the joint and IVD

The research project will focus on the design of nucleic acid vectors based on a new family of fully biodegradable dendrimers. The successful candidate will design and develop a non-toxic and targeted nanoparticle system capable of delivering therapeutic nucleic acids to chondrocytes and intervertebral disc cells. This project involves not only the design and preparation of potentially new nanotherapeutics for treatments of patients suffering from osteoarthritis or low back pain, but also the initial biological tests (in vitro) of these novel nanomedicines. In addition, together with other early stage researchers (ESRs), in vivo studies showing proof of principle will be initiated.

The PhD student position is part of a European ITN network consisting of 15 PhD students enrolled at different universities and institutes across Europe called CARTHAGO (<https://itn-carthago.sites.uu.nl>). The CARTHAGO project is an international PhD programme on non-viral gene therapy in regenerative medicine for osteoarthritis and intervertebral disc degeneration coordinated by the University Medical Center Utrecht (UMCU). Together with 8 academic and 4 non-academic partners across 10 EU countries, it offers a unique opportunity to excellent PhD candidates (early stage researchers, ESRs) to gain experience and skills with short-term selected secondments within a world class consortium.

The overall goal is to address the applicability of gene therapy in osteoarthritis and intervertebral disc (IVD) degeneration from all perspectives, including optimisation of cell delivery, gene expression and tissue penetration. The approach of the consortium is to design cutting-edge technology with respect to biomaterial aided delivery of gene expression regulators.

At INEB, the selected ESR will be hosted within the nanoBiomaterials for Targeted Therapies (nBTT) Group of i3S|INEB (<https://www.i3s.up.pt/research-group?x=37>). Our aim is to develop "smart" biomaterials, designed at the nanoscale with controlled architectures and functionalities, to provide in situ and in a targeted manner the required signals to promote tissue repair and restoration of function. The nBTT is part of the i3S (www.i3s.up.pt), the Institute for Research and Innovation for Health. The i3S is dedicated to research and innovation in basic, applied and translational Health and Life sciences. It focuses on 3 research programs: Cancer; Host Interaction and Response; Neurobiology and Neurologic disorders. The transdisciplinarity of the programs allows to address questions at the molecular and cellular basis of living systems, mechanisms underlying disease and promotes the development of novel tools for screening, diagnostic and therapeutic strategies. The i3S core facilities provide access to advanced equipment for research in several fields (<https://www.i3s.up.pt/scientific-platforms>). Furthermore, i3S fosters continuous advanced trainings for scientists and implements annual educational and outreach activities to close the gap between science and society.

For the present project three (3) research exchanges are planned with the following consortium partners: University Medical Center Utrecht (UMCU), the Netherlands; CureVac, Germany and AO Research Institute Davos, Switzerland.

The INEB ESR will join the Biomedical Engineering PhD within the Faculty of Engineering of the University of Porto (www.fe.up.pt). This PhD program, that will be designed according to the student needs, offers access to a variety of post-graduate courses within the University of Porto that range from technical courses to transferable skills training.

Requirements

We are looking for a candidate with a background in chemistry (organic, polymer and/or materials chemistry) and interest in nanomedicine, who is able to collaborate in a diverse team, consisting of fundamental and clinical scientists from many disciplines, including chemistry, physics, molecular biology, bioimaging and medicine. Experience in organic synthesis and NMR characterization of organic compounds will be highly valorized.

In addition, candidates should have:

- Excellent proficiency of the English language (both oral and written),
- The ability to work in a multidisciplinary team. Excellent communication skills and cooperation skills are required,
- An inquisitive mind-set, accuracy and self-reliance are very important. You are required to be flexible and mobile, including willingness to travel to other partners for 1-4-month secondments,
- High interest in receiving training from supervisors from different institutes, disciplines and sectors,
- High motivation to contribute to the dissemination of results and outreach to both specialists and the public at large,
- Enthusiasm to visit Consortium Partners for secondments (internships). ESRs will benefit from a dedicated training program in the various fields of expertise of the consortium partners.

Additional Information

In accordance with the very strict EC Marie Skłodowska Curie Actions ITN the following eligibility criteria were defined:

- Candidates did not reside or carry out their main activity (e.g. work, studies) in the host country for more than 12 months during the 3 years immediately prior to the start of their CARTHAGO appointment (time spent as part of a procedure for obtaining refugee status under the Geneva Convention, compulsory national service and/or short stays such as holidays are not taken into account).
- Candidates are in the first 4 years of their research careers at the start of their CARTHAGO appointment (full-time equivalent research experience, measured from the date when a researcher obtained the degree entitling him or her to embark on a doctorate) and have not been awarded a doctoral degree

The CARTHAGO consortium has the aim to reach a good gender balance.

How to apply

If you meet all of the eligibility criteria, please submit your application at the CARTHAGO website <https://itn-carthago.sites.uu.nl/>, no later than October 25, 2020 (23h59 GMT+2).

For further information, applicants may contact the principal supervisor: Ana Paula Pêgo (apego@i3s.up.pt).