2 PhD scholarships in “Pre-clinical studies on therapeutic factor delivery in the basal ganglia for PD and HD” and ” Pre-clinical studies on neurotransmitter replacement in the basal ganglia for PD and HD”

Applications are invited from suitably qualified candidates for any of two positions funded by the Marie Skłodowska-Curie project “Training4CRM” (“European Training Network for Cell-based Regenerative Medicine”) within the Horizon 2020 programme of the European Union, starting latest in October 2017. The appointment will be on a temporary basis for a maximum period of 3 years (PhD student) and will be placed at the Dept. Molecular Biology, Universidad Autónoma of Madrid (UAM), and Dept. Molecular Neuropathology of the Centre of Molecular Biology Severo Ochoa (CBMSO, CSIC-UAM)(www.cbm.uam.es).

General Description of the project.

Training4CRM is a four-year project, funded by the European Union Horizon 2020 Programme (H2020-MSCA-ITN-2016) under the Marie Skłodowska-Curie Innovative Training Network (European Training Network) and Grant Agreement No. 722779 (see project summary at the end). The project is highly cross disciplinary and focuses on bridging the existing gaps within Cell-based Regenerative Medicine (CRM) for treatment of neurodegenerative disorders (e.g. Parkinson’s (PD), Huntington’s (HD) Epilepsy (EPI)). The project offers training in transferrable skills and inter-disciplinary research training in micro- and nano-engineering, biotechnology and pre-clinical research, at the highest international level and quality. The Taining4CRM network comprises 6 academic and 3 industrial beneficiaries from 6 European countries (Denmark, Spain, Sweden, Norway, Italy, and the Netherlands). In addition, six other partners, mostly non-academic, will offer secondments and specialised training. The Project Summary can be found at the end of this document.

Two PhD positions (ESRs 12, 13) are available to study either therapeutic factor delivery or neurotransmitter replacement, using cell carrier implants (carbon and polymer scaffolds), in clinically relevant animal models of Parkinson’s and Huntington’s diseases. The microglial and glial reaction of the host to the implants will be studied, alongside the histological migration, survival and integration of the implanted cell-loaded probes. Neurotransmitter release will be optogenetically controlled. Therapeutic effects of the factors and/or neurotransmitters will be studied. Host brain and implant crosstalk will also be studied

[A summary of the thesis projects can be made available upon request].

Responsibilities and tasks

The intended PhD student will be a member of this multi-disciplinary team and will involve the following specific tasks:

ESR 12
- Methods for cell loading of the probes to be implanted (bio-implants). Study the therapeutic factor production
- Use of different types of scaffolds for the 3D growth of loaded stem cells
- Develop probe implantation (bio-implant) procedures into the rodent brain, and study the host reaction to the implanted probes
- Histological study of cell survival, migration and differentiation into the host brain
- Study the therapeutic effects of the implants in PD and HD models. Neuron rescue capacity and re-organization and sprouting of the host brain circuits
- Develop current injection protocols for the killing of the implants and/or surrounding tissue

ESR 13
- Methods for cell loading of the probes to be implanted (bio-implants). Optical stimulation of the cells and measurement of neurotransmitter release
- Use of different types of scaffolds for the 3D growth of loaded stem cells
- Develop probe implantation (bio-implant) procedures into the rodent brain, and study the host reaction to the implanted probes
- Histological study of cell survival, migration and differentiation into the host brain
- Analysis of the interplay between neurotransmitters and electrical cues during development of human neural tissue
- Study the therapeutic effects of the implants in PD and HD models. Optogenetic control of neurotransmitter release in vivo
- Study the electrical coupling of the implant and host brain

Expected Results:
ESR12:
Methods for cell loading onto the probes, and in vivo probe implantation. Cell implant performance in vivo. Physical and anatomical host-implant connectivity. Migratory potential of the cells, possibly leading to encapsulation. Therapeutic anatomical, histological and locomotor effects exerted by the implants. Remove/kill the cells implant (as long as they do not migrate extensively).

ESR13:
Close to physiological control of neurotransmitter release by the optogenetically modified stem cell progeny. Reproducible methods for cell loading onto the probes. Surgical tools and methods for probe implantation. Therapeutic implant effects in PD & HD models. Physical and anatomical host-implant connectivity. Host capacity to physiologically control the electrical/cellular capacities of the implanted cells.

The candidates must meet the following requirements (see also the Eligibility criteria for MSCA, in particular the mobility rule, at the EU Participants Portal: http://ec.europa.eu/research/mariecurieactions/index.htm):
• Spend external stays (secondments) at designated institutions of the consortium, i.e. University of Barcelona (ES), University of Lund (SE), GexNano (IT) or NsGene, Inc. (USA); a maximum of 10 months
• Participate in training events for researchers and Principal Investigators involved in the program.
• Reporting to the Project Manager which includes contributing to periodic scientific reports
• Contributing to the reporting of project milestones and deliverables in accordance with EU deadlines
• Promoting and disseminating results involved in the program, which includes contributing to newsletters and participating in outreach events
• Willingness and ability to collaborate in a multidisciplinary team.

Qualifications
Candidates need to have a master's degree in Biomedicine, Neurosciences, bio-engineering or tissue engineering (or a similar degree) with a background in cellular and molecular biology, biochemistry, biotechnology, or neurobiology.

The applicant should have experience with small animal research and Stem Cells culture and phenotyping. Other relevant scientific background, includes
• Experience doing research in animal models of disease
• Experience with nervous system histology and behavioural analyses
• Experience with hydrogels or tissue scaffolds

Essential:
• Less than 4 years full time equivalent research experience at the time of recruitment, and not yet been awarded a doctoral degree (PhD)
• European H2020 funding mobility rules apply, notably applicants must not have spent more than 12 months in the country of the recruiting/host institution (Spain) within the 3 years immediately prior to start of project.
• Excellent communication and organisation skills
• Fluent in spoken and written English
• Excellent writing and presentation skills
• Willingness and ability to work in a multi-disciplinary team and multicultural environment
• Availability to travel nationally and internationally two to three times a year

Desirable:
• Having been awarded a personal license for animal experimentation
• Experience with intracerebral transplantation
• Experience in gene therapy methods
• Experience in developmental neurobiology, neural stem cells
• Experience with outreach events
• A keen interest in pursuing pre-clinical research into neurodegenerative diseases, particularly Parkinson’s and Huntington’s diseases

Approval and Enrolment
The scholarships for the PhD degree are subject to academic approval, and the candidates will be enrolled in the Molecular Biosciences doctoral program at UAM. For information about the
general requirements for enrolment and the general planning of the scholarship studies, please see the UAM and Doctoral Program websites:

https://www.uam.es/ss/Satellite/es/1234886370669/sinContenido/Programas_de_Doctorado.htm


**Assessment**
The assessment of the applicants will be made by Professor Alberto Martínez Serrano and Senior Researcher Marta P. Pereira, at the CBMSO, Professors. Josep M. Canals and Jordi Alberch (Univ. Barcelona)

**Closing date for receipt of applications is 5.00 pm on Friday July 14th, 2017**

**We offer**
We offer an interesting and challenging job in an international environment focusing on education, research, public-sector consultancy and innovation, which contribute to enhancing the economy and improving social welfare. We strive for academic excellence, collegial respect and freedom tempered by responsibility. The University Autónoma de Madrid (UAM) is one of the leading universities in Spain, benchmarks with the best universities in the world. The CBMSO is a pioneering centre for research in Molecular Biology in Spain, since its foundation in 1975 (www.cbm.uam.es)

**Salary and appointment terms**
The salary will be in line with the European Commission rules for Marie Skłodowska-Curie grant holders (Early-Stage Researchers, Innovative Training Network). http://ec.europa.eu/research/mariecurieactions/index.htm.
The period of employment is 3 years.
The applicant must be ready to start during October 2017, the latest.

**Workplace**
The main work will be conducted at the CBMSO, Dept. of Molecular neuropathology, in the Human Neural Stem Cells group, but it also includes mandatory short stays for research and training at other universities (DTU in DK; U. Lund in SE, U. Barcelona in Spain), and in the company NsGene (USA).
The CBMSO is a research institute at the Excellence Campus UAM and represents a cross-disciplinary research environment where molecular and cellular biology are applied to a wide range of scientific disciplines, most of them related to biomedical research, e.g. molecular pathology, neurobiology, development, genome dynamics, immunology, cancer research, and microbiology.
The Center of Molecular Biology Severo Ochoa (www.cbm.uam.es) is the largest institution in Spain devoted to research in Molecular and Cellular Biology. It is a joint research Institution, bringing together scientists from the Spanish Council for Research (CSIC), and the Department of Molecular Biology of the Autonomous University of Madrid (UAM). The fundamental characteristic of CBMSO’s research is that it covers basic and fundamental aspects in the
biology field, which have an important translational value. From its origin, one of the CBMSO strengths has been its multidisciplinary nature and its association to UAM, participating of the students training and courses teaching at many levels.

Further information
Further information may be obtained from Alberto Martínez at tel: +34 91 196 4620. You can read more about CBMSO on www.cbm.uam.es

Please send applications to Alberto Martínez, at amserrano@cbm.csic.es

Application
Please submit your application by e-mail no later than 5.00 pm on Friday July 14th, 2017, indicating if you apply for ESR 12, 13 or both

Applications must be submitted in English in one pdf file containing all materials to be given consideration. The file must include:

- A motivation letter describing your research career goals, skills and experience (cover letter)
- Curriculum vitae
- Grade transcripts and BSc/MSc diploma (official translation into English)
- Excel sheet with translation of grades
- Three or four contact/reference persons (including e-mail addresses).

Candidates may apply prior to obtaining their master's degree, but cannot begin before having received it.

All interested candidates irrespective of age, gender, race, disability, religion or ethnic background are encouraged to apply.
1.1. The project summary

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Abstract

The main objective of Training4CRM is to train a new generation of 15 highly inter-disciplinary early stage researchers at the highest international level and quality, who will be immediately employable in both the academic and industrial sectors due to their highly sought after cross- and interdisciplinary insights and expertise. Training4CRM addresses existing gaps within Cell-based Regenerative Medicine for treatment of neurodegenerative disorders (e.g. Parkinson’s, Huntington’s, Epilepsy), which occur as a result of progressive loss of structure, function and/or death of neurons in the brain. The disorders have a high prevalence and are associated with impairments and disabilities with high emotional, financial and social burden. New scientific discoveries and technologies are needed, and Training4CRM sets out with the ambition to educate and train students within and across different scientific disciplines to be able to master the design, fabrication and testing of completely new tools and materials within the fields of: Micro- and Nanoengineering (nano/microstructures, 3D scaffolds and 3D lab-on-a-chip devices of different materials, geometries, architectures and properties, wireless electronic components; Biotechnology (human stem cells, human induced pluripotent stem cells, optogenetics, tissue engineering; Pre-clinical studies for the purpose of investigating in vivo, in experimental animals, how the developed cells, materials, structures affect the animal at the physiological and behavioral levels, unravelling the therapeutic effects of the developed strategies.