HUMANITAS UNIVERSITY

Selection procedure for 1 Type B Research Fellowship in Life Sciences in compliance with art. 22 of Law 240/2010

Humanitas University invites applications for 1 position as Research Fellow in Life Sciences.

Research Program Title	"**Studio dei meccanismi che associano l'infiammazione al danno sinaptico**." *Courtesy translation*: Dissecting the pathway linking inflammation to synaptic damage.
Tutor	Prof. Michela MATTEOLI
Scientific Area	05 - BIological Sciences
Gross amount of the fellowship	23.000 Euro
Duration of the fellowship	12 months
Objectives of the research	Recent evidence indicated a link between immune system activation and neurodevelopmental or neurodegenerative diseases, but the molecular mechanisms involved and the possibility that these processes specifically hit the synapse, which represents the key target in several brain diseases, are not established yet. Recent observations indicated that the pro-inflammatory cytokine IL-1β negatively impacts synapse structure and function and modulates the expression of two transcription factors, MeCP2 and REST which orchestrate epigenetic remodelling and silencing of neural genes. Goal of the project is to explore whether and how MeCP2 and REST dysregulation contributes to the pathogenesis of brain diseases characterized by an inflammatory component, to ultimately identify novel molecular targets and therapeutic strategies. Our study will boost further research into drugs targeting mechanisms controlled by the immune system as novel therapeutic strategies for selected brain pathologies.

Activities to be carried out	The candidate will assess neuronal network dynamics in MeCP2-silenced neuronal cultures and in brain slices and cultures from mice subjected to maternal immune activation. Analysis of spine and synapses will be performed by confocal microscopy and quantitative analyses will be performed with Imaris and ImageJ softwares. With similar techniques, the effect of compounds bocking IL-1b signaling will be also assessed. Analysis of spine and synapses will be performed by confocal microscopy.

The work place is in Pieve Emanuele - Milano.

A brief description of the project, activities to be carried out, mandatory requirements to take part into the selection process, information on the application procedure and on the selection criteria are presented in the following.

RESEARCH PROJECT:

Recent evidence indicated a link between immune system activation and neurodevelopmental or neurodegenerative diseases, but the molecular mechanisms involved and the possibility that these processes specifically hit the synapse, which represents the key target in several brain diseases, are not established yet. Recent observations indicated that the pro-inflammatory cytokine IL-1β negatively impacts synapse structure and function and modulates the expression of two transcription factors, MeCP2 and REST which orchestrate epigenetic remodelling and silencing of neural genes. Goal of the project is to explore whether and how MeCP2 and REST dysregulation contributes to the pathogenesis of brain diseases characterized by an inflammatory component, to ultimately identify novel molecular targets and therapeutic strategies. Our study will boost further research into drugs targeting mechanisms controlled by the immune system as novel therapeutic strategies for selected brain pathologies.

ACTIVITIES TO BE CARRIED OUT:

The candidate will assess neuronal network dynamics in MeCP2-silenced neuronal cultures and in brain slices and cultures from mice subjected to maternal immune activation. Analysis of spine and synapses will be performed by confocal microscopy and quantitative analyses will be performed with Imaris and ImageJ softwares. With similar techniques, the effect of compounds bocking IL-1b signaling will be also assessed. Analysis of spine and synapses will be performed by confocal microscopy.

MANDATORY REQUIREMENTS:

In order to be considered for the post candidates must hold a Master's Degree in Medical Biotechnology and Molecular Medicine or equivalent and a PhD in Morphological Sciences or related discipline.

SELECTION PROCESS:

Application for admissions must be submitted at the following link**:**

https://pica.cineca.it/humanitas

No hard copy of the application must be sent by post.
At first access, applicants need to register by clicking on "Register" and completing the requested data.
If applicants already have LOGINMIUR credentials, they do not need to register again. They must access with their LOGINMIUR username and password in the relevant field LOGINMIUR.
Applicants must enter all data necessary to produce the application and attach the required documents in PDF format.

SELECTION CRITERIA:

Selection criteria are predetermined by the Selection Committee. As part of the selection process, the Committee will evaluate the curriculum, titles and publications presented by the candidate and will consider, in particular:

- Experience in neuroanatomy: transcardiac perfusion, traditional histological procedures, using free-floating or slide fixed sections;
- Immunohistochemical and immunofluorescence procedures on brain sections;
- Experience with light microscopy and confocal microscopy, image analyses;
- Experience with biochemistry: preparation of subcellular fractions, synapses purification, SDS-PAGE and Western-Blot analysis;
- Knowledge of animal-care techniques, transgenic mice manipulation;
- Experience analysis of brain functions in vivo (stereotaxic surgery for the implant of EEG devices, EEG recording and analyses);
- experience in stereological counting and 3D volumetric reconstruction analysis;
- experience in behavioral phenotying applied to mouse models;
- excellent knowledge of English, written and spoken;
- knowledge of the Italian language (only for foreign candidates).

FURTHER INFORMATION:

For more details on the selection process please refer to the **Rectorate Decree n. 013/2021** (http://www.hunimed.eu/it/lavora-con-noi/) or send an inquiry to ufficiodocenti@hunimed.eu or telephone +39 02.8224.5642/5421.