Consiglio Nazionale delle Ricerche
Istituto di Biofisica - Unità di Trento

# -- Call for Expression of Interest --

**POSITION**: Post-Doc (Senior)

**RESEARCH TITLE**: Functional evaluation of nutraceutical neuroprotection of neuronal ion channels in neurodegenerative diseases: a putative molecular target for neuroresilience

**PROJECT**: In neurodegenerative diseases (NDDs) the analysis of neuronal excitability exerted by transmembrane proteins called ion channels is crucial for monitoring the disease. The pathogenic role of ion channels lies in the alteration of the intrinsic excitability of the cell and in the pathophysiological signs of disease. In previous works on SBMA-Spinal and Bulbar Muscular Atrophy, we have proposed the alteration of neuronal excitability as a marker of the pathological phenotype of the disease, demonstrating the role of different drugs in improving the symptomatic picture of the disease through the improvement of impaired excitability. The project, with the use of different NDDs' cell models (including iPSCs) and of biophysical-pharmacological approaches, intends to quantitatively establish whether natural and/or nutraceutical compounds can exhibit neuroprotective and neuroresilient effects, acting as symptomatic rescuers in NDDs through the regulation of ion channels electrical activity.

**REQUIREMENTS**: **The candidate must have a PhD in neuroscience or neuropharmacology or biophysics, or related disciplines, and documented previous research work experience *The successful candidate would have strong ability to work independently, independence in planning, performing experiments and data analysis, full command of English, be self-motivated, goal-oriented and have a positive attitude*.**

***Essentials*: Strong experience in electrophysiology (patch-clamp), in establishing and/or maintenance of cell culture, in molecular biology techniques and pharmacological approaches.**

***Desirables*: Experience with neuropharmacology a/o molecular imaging tech (functional imaging, ion and voltage probes) a/o with iPSCs. Experience in studying neurodegeneration would be an asset, although not mandatory.**

**HOST LABORATORY**: The lab of "Neurosystems and Photosensory Biophysics" (Dr. Carlo Musio, PI) belongs to the Institute of Biophysics (IBF) of the Italian National Research Council (CNR) located in Trento, Italy. The lab researches the role of the physiological and altered neuronal activity, at ion channels level, in the pathogenesis of NDDs (see refs below). This project is funded by an Italian banking foundation, Fondazione CariVerona, based in Verona, Veneto, with the support of a key Italian nutraceutical company and the Stem Cells Lab at CIBIO Dept, University of Trento. We are equipped for patch-clamp recordings, functional imaging, microscopy, molbio and cellbio tools.

**DURATION AND SALARY**: 1+1 years, gross salary € 26.000 p.a., net salary € 22.965 p.a. (≈ € 1.900 monthly).

**APPLY**: Potential candidates are requested before **10th January 2023** to send inquiries a/o a letter of interest explaining how they would fit, a CV, a record of their academic results and the names of two references to: *Dr. Carlo Musio*, carlo.musio@cnr.it . The final recruitment will follow the formal procedures for "Assegno Senior" established by the CNR and should be concluded by the end of January 2023.

**Lab recent selected references:**


Martinez-Rojas et al (2022) Ion channels and neuronal excitability in polyglutamine neurodegenerative diseases. *Biomol Concepts* 13:183-199.

Martínez-Rojas et al (2021) Clenbuterol-sensitive delayed outward potassium currents in a cell model of SBMA *Pflügers Archiv–Eur J Physiol* 473:1213-1227.

Cutarelli et al. (2021) A monolayer system for the efficient generation of motor neuron progenitors and functional motor neurons from human pluripotent stem cells. *Cells* 10(5):1127.

Martínez-Rojas et al (2021) ClC-2-like chloride current alterations in a cell model of SBMA, a polyglutamine disease. *J Mol Neurosci* 71:662–674.

Tripathy et al. (2020) Increased transcription of transglutaminase 1 mediates neuronal death in in vitro models of neuronal stress and Aβ1-42-mediated toxicity. *Neurobiology of Disease*. 140:104849.

Jimenez-Garduño et al (2017) Altered ionic currents and amelioration by IGF-1 and PACAP in motoneuron-derived cells modelling SBMA, *Biophys Chem* 229:68-76.