Doctoral Position Offer
in the frame of a CIFRE Grant

Position: A doctoral position for an enthusiastic and motivated individual is available for 3 years (starting September 1rst 2015) in the research team Sensory Processing and Neuroplasticity at the Laboratory of Integrative & Adaptative Neuroscience (UMR7260 CNRS-AMU, Marseille, France).

Project: **Characterization of inner ear synaptic repair mechanisms**

Hearing and balance disorders constitute a booming health problem and a unmet medical need. In France, hearing loss affect more than 10% of the adult population, while vertigo is the third motive for consultation to the general practitioner doctor and represents 5 % of hospital emergencies. Hearing and balance pathologies therefore constitute a significant burden to our health care system. Acute cochlear or vestibular deafferentations are believed to support a majority of auditory and vestibular syndromes such as noise induced hearing loss and sudden hearing loss, or labyrinthitis, vestibular neuritis, vertigo of ischemic origin and Menière disease. There is currently no targeted pharmacological therapy to efficiently repair the inner ear primary synapses under pathological conditions. However, an endogenous process of synapses post injury self-repair occurs in the mammal ear. This process allows under certain conditions to restore hearing and balance. Present project intends to explore the repair processes at inner ear primary synapses, decipher their different phases and identify the cellular pathways and effectors involved. Several transcriptomic studies on deafferented sensory neuron types have revealed changes in the expression of several genes later demonstrated to directly support post-injury neurite outgrowth or synaptic repair. In the present study, we propose to take advantage of these different transcriptomic approaches to assess the involvement of candidate pathways and effectors in the endogenous synaptic repair process that occurs in the adult mammal inner ear following deafferentation. In turn we ambition to find pharmacological approaches to stimulate the synaptic repair processes and optimize the functional restoration of hearing and balance. In this aim, we propose to develop *in vitro* and *in vivo* models of inner ear organs selective deafferentation, assess the adaptive modulation of candidate genes expression by the mean of QRTPCR/protein array and immunocytochemistry, and test the benefits of pharmacological modulation of the candidate pathways and effectors on the inner ear synaptic repair and restoration of hearing and balance. Present project is a prerequisite to the development of pharmacological approaches to optimize and control the mechanism of synaptic repair within the inner ear, with the ambition to significantly impact the clinical management of these pathologies. It will be achieved through a close collaboration between the UMR7260 CNRS-AMU and Sensorion-Pharma.

Candidate profile: Candidates should have good background in molecular biology and cell culture. Experience in animal behaviour is welcome. Applicants should have a Master degree in Neuroscience or Biomedical Sciences.

Procedure: Please send an email with a CV and a letter of recommendation to:

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