Three-year PhD position in Neuro-ethology in Caen (France)

Title: Phylogeny of depression disorders: study of primal forms of Depression in Invertebrates (DepIn)

<u>Key-words</u>: phylogeny, emotional states, behaviors, sensorimotor deficits, invertebrates, serotoninergic pathway

<u>Abstract</u>: According to the World Health Organization, depression is the leading cause of disability in the world. Depression is characterized by persistent low mood, impaired motivation but also by a general decrease in motor outputs that is generally considered as a consequence of brains structures impairment but never as consequence of sensorimotor networks deficit. DepIn project aims to lead a comparative study on crustacea and cephalopod to demonstrate that depressive-like behavior associated with sensorimotor deficits emerged early in the evolution tree. This project aims to develop new behavioral tests to measure depressive-like behavior markers such as anxiety, pessimistic bias, resignation behavior, food intake, and social responses after a chronic stress protocol. These markers are some criteria to characteristic depressive state in animal models and human (DSM-5 criteria) and consequently their evaluations are essential to confirm whether our stress procedures trigger a depressive-like state in our models. Then this project will investigate if the depressive-like disorders observed in these invertebrate models are correlated with sensorimotor impairment. Motor behavior and performance of specific sensorimotor loops will be investigated. This project will study the neural mechanisms of motor deficits and their consequences on depressive states. Moreover, as alteration in serotonin (5-HT) modulation is a key element of depression, the role of 5-HT will be analyzed in motor deficits induced by depression. The originality of this proposal is the comparative approach that will provide crucial insights on the role of non-cerebral structures in the genesis and maintenance of depressive states. Taken together, the results obtain in this proposal will bring new important findings regarding the origin of depressive states and be the basement for new investigations on vertebrate models about the neuronal mechanisms highlighted.

<u>Profile</u>: The candidate should hold a Master degree in neuroscience or behavioral sciences or other relevant disciplines. Knowledge and/or experiences in behavioral protocols is mandatory and experiences with aquatic animal models would be appreciated.

<u>Working environment</u>: The position is based on the marine station of the university of Caen (CREC: centre de recherche en environnement cotier – Luc-sur-Mer) which provides facilities dedicated to cephalopod and crayfish rearing, aquarium infrastructure to execute behavioral experiments and histology/microscopy laboratories for neurobiological protocols. The candidate will have access to all behavioral equipment including video cameras, tracking software (i.e. Ethovision) and computers. In complement neurophysiological approaches are possible via a dedicated electrophysiological platform. The city of Caen is located near to the French coast of English channel and is just two hours from Paris. This project is funded by the ANR (agence national de la recherche).

<u>Supervisors</u>: Pr Ludovic Dickel and Dr Julien Bacqué-Cazenave
<u>Research unit</u> : Ethos UMR6552, CNRS, Université de Caen, Université de Rennes
<u>Research team</u>: NECC Cognitive Neuro-ethology of cephalopods (Pr Ludovic Dickel)

<u>Application</u>: The application must include an application letter and a CV and must be sent to ludovic.dickel@unicaen.fr and julien.bacque-cazenave@unicaen.fr

Application deadline: 11/09/2023   **Starting date: October 2023**