

POSTDOCTORAL POSITION

Extracellular vesicles associated to indole-producing synthetic gut community: a signal pathway between gut microbiota and brain in newborns?

The UMR 1280 (Physiopathology of Nutritional Adaptations, PhAN), <https://www6.angers-nantes.INRAE.fr/PhAN>, is a Research Unit affiliated with INRAE AlimH Department (Nutrition, Chemical Food Safety, Consumer Behavior Research Division, <https://www.INRAE.fr/en/divisions/human-nutrition>) and Nantes University (UN) (<https://english.univ-nantes.fr>). It is also supported by INRAE MICA (Microbiology and Food Chain Research Division, <https://www.inrae.fr/en/divisions/mica>). It is a unique structure that performs translational and clinical research on the role played by nutrition in the first 1000 days of life in human, thanks to the collaborative work between obstetricians and pediatricians of CHU de Nantes, professors at the UN, and researchers at INRAE, through studies performed in cohorts of women and infants, and deciphers mechanisms through the use of experimental animal models. The research conducted at UMR PhAN is dedicated to specific fields of developmental programming and the Developmental Origins of Health and Disease (DOHaD).

The bacterial extracellular vesicles (BEVs) produced by gut microbiota convey active biomolecules. Over the last decade, diverse functions of molecules transported by BEVs have been described to modulate host responses at different levels. The human gut microbiota is considered as one of the main factors contributing to the health care throughout the life and it could have a long-term impact according to the DOHaD concept. More recent studies on the microbiota-brain axis have shown that the indole (only synthesized by bacteria) and its derivative compounds have an effect on the central nerve system (CNS). This was correlated with cerebral disorders of C-section babies compared to vaginal delivered infants. The main objective of this study aims at investigating the BEVs from indole-producing bacteria frequently found in newborn gut microbiota. The study will include the analyses of samples for BEVs production from *in vitro* bacterial cultures and *in vivo* experimentations on preclinical models in controlled conditions. BEVs will be characterized by physical and biological assessments after extraction and purification. Biological functions of the BEVs derived from indole-producing bacteria and synthetic gut communities will be determined using our expertise on specific stem cell lines and *ex vivo* electrophysiological analyses on brain slides.

Position: 18-month Postdoctoral contract

Starting date: As soon as possible

Research funding: The position is funded by MICA-AlimH at INRAE-FRANCE

Contact: Applications should be addressed by e-mail to Dr Odile Tresse (odile.tresse@inrae.fr), including a curriculum vitae with a short statement for research interests, scientific production and the contact information of at least two referees

Location: Physiopathology of Nutritional Adaptations (UMR PhAN-1280), Nantes Hospital Hôtel-Dieu, Medical University of Nantes, France

Candidate profile and required skills: We are looking for a rigorous candidate with creative and collaborative spirit. PhD in Microbiology, Experience/Knowledge in EVs, Scientific English speaking and writing are required. Knowledge in microbiota is recommended. Good communication skills (oral and written) and the ability to work in a team are essential.