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## **Post doc position (26 months) available at STLO, Rennes, France on Health promoting properties of probiotic-derived extracellular vesicles**

The STLO-lab, based at Rennes, France, is looking for one postdoctoral researcher to join us next year (early 2024). STLO is internationally recognized as the leading team working on *P. freudenreichii*, a dairy bacterium widely used as a cheese ripening starter. In addition to techno-functional properties, the bacterium also displays probiotic characteristics, such as the production of beneficial metabolites (Vitamin B12, SCFAs, DHNA) and modulation of host microbiota. *P. freudenreichii* probiotic properties were mainly studied at STLO, which published 68 research publications on this bacterium. Notably, STLO has demonstrated the ability of some *P. freudenreichii* strains to display anti-inflammatory properties *in vitro* on various cell models, including human PBMCs and cultured human intestinal epithelial cells. Such strains also alleviate *in vivo* the inflammation in experimentally induced colitis (TNBS and DSS-induced) and mucositis. STLO has shown that the surface-exposed Slp proteins, notably SlpB, are involved in the anti-inflammatory properties of the bacterium *in vitro* and *in vivo*. More recently, for the first time, STLO has demonstrated that *P. freudenreichii* produces extracellular vesicles (EVs) and has provided a complete characterization of their physiochemical, biochemical and functional features. *P. freudenreichii*-derived EVs exhibit anti-inflammatory activity towards cultured human intestinal epithelial cells via NF- $\kappa$ B pathway modulation and bacterial growth media impact EVs properties, including anti-inflammatory activity<sup>1, 2, 3</sup>.

The candidate will be in charge of the Molecular and functional study of health promoting properties of probiotic-derived extracellular vesicles. For this position The French National Research Institute for Agriculture, Food, and Environment (INRAE) is looking for a cellular biologist or a cellular microbiologist with experience in (or interest to learn) the study of EVs to investigate the health-promoting properties of EVs secreted by probiotics, including *P. freudenreichii*, and their mechanisms of action on the host. The health-promoting properties of EVs (eg immunomodulation, anti-inflammation, neuromodulation, epithelial barrier maintenance) from an isolated strain and/or a pool of EVs from a combination of strains/species (grown individually) will be tested *in vitro* in various cell models and *in vivo* in preclinical models. This includes models of acute inflammation (Inflammatory Bowel Diseases-IBD), low-noise inflammation (Irritable Bowel Syndrome-IBS) associated with cognitive-emotional and behavioral disorders, or in model of neurodegenerative pathology (Alzheimer's). The bacterial EVs will be characterized at both biophysical and molecular levels (proteins, lipids, sugars, nucleic acids, metabolites) to identify the bacterial effectors associated with their benefit properties. Likewise, We will also engineer the content of EVs will be also engineered to enhance their intrinsic properties and activities. Their mechanisms of action on host cells (eg signaling via receptors, endosomal internalization, identification of targets) will also be investigated.

The post-doc project is part of the PEPR (programmes et équipements prioritaires de recherche) BBIT BACTER-EV-BOOSTER research program that brings together transdisciplinary prestigious groups (UMR7057 MSC, UMR1359 MICALIS, UMR PAM, UMR7203 LBM, UMR1107, UMR1235 TENS, and UMR1253 STLO) to develop multidisciplinary approach to stimulate the bioproduction and engineering of Gram+ bacteria's EVs for therapeutic applications to treat inflammation. The planned start is in early 2024 and the position is for 30 months. The application deadline is April 1, 2024.

If interested, please contact Éric Guédon for an informal chat. email: [eric.guedon@inrae.fr](mailto:eric.guedon@inrae.fr)

la science pour la vie, l'humain, la terre

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