Nantes Université

Offre de stage M2 Cursus Master/Doctorat
Ecole Universitaire de Recherche Sciences et Technologies de la Santé
et Master 2 Biologie et Médicaments
UE XMS2BU100&101 – (2 pages max.)

FORMATION CONCERNEE

☐GP Immunologie et Immuno-Intervention (I^3)
☐GP Oncologie, Hématologie et Médecine Nucléaire (OHNU)
☒**GP Microbiote, Intestin, Cerveau, Alimentation, Santé (MICAS)**
☐GP Innovation for CArdiovascular, metabolic and REspiratory diseases (InnoCARE)
☐GP Médecine 4R, Réparer, Remplacer, Régénérer, Reprogrammer (M4R)

TITRE DU STAGE :

Role of the Enteric Nervous System in the intestinal translocation of the opportunistic bacteria: *Streptococcus agalactiae*.

LABORATOIRE D'ACCUEIL :

TENS-INSERM 1235

EQUIPE D'ACCUEIL :

TENS-INSERM 1235 (research axis: infectious disease)

RESPONSABLE(S) SCIENTIFIQUE(S) ET ADRESSE(S) MAIL :

NOM : **AYMERIC** **Prénom : Laetitia**

Mail : **laetitia.aymeric@univ-angers.fr** **N° téléphone**

TITRES ET TRAVAUX DE L'EQUIPE D'ACCUEIL (5 PUBLICATIONS LES PLUS SIGNIFICATIVES) :

Blin J, Gautier C, Aubert P, Durand T, Oullier T, Aymeric L, Naveilhan P, Masson D, Neunlist M, Bach-Ngohou K. Psychological stress induces an increase in cholinergic enteric neuromuscular pathways mediated by glucocorticoid receptors. Front Neurosci. 2023 Feb 14;17:1100473. doi: 10.3389/fnins.2023.1100473

Herbreteau A, Aubert P, Croyal M, Naveilhan P, Billon-Crossouard S, Neunlist M, Delneste Y, Couez D, Aymeric L. Late-Stage Glioma Is Associated with Deleterious Alteration of Gut Bacterial Metabolites in Mice. Metabolites. 2022 Mar 25;12(4):290. doi: 10.3390/metabo12040290

Gonzales J, Marchix J, Aymeric L, Le Berre-Scoul C, Zoppi J, Bordron P, Burel M, Davidovic L, Richard JR, Gaman A, Lejuste F, Brouillet JZ, Le Vacon F, Chaffron S, Leboyer M, Boudin H, Neunlist M. Fecal Supernatant from Adult with Autism Spectrum Disorder Alters Digestive Functions, Intestinal Epithelial Barrier, and Enteric Nervous System. Microorganisms. 2021 Aug 13;9(8):1723. doi: 10.3390/microorganisms9081723

Nantes Université

Aymeric L, Donnadieu F, Mulet C, du Merle L, Nigro G, Saffarian A, Bérard M, Poyart C, Robine S, Regnault B, Trieu-Cuot P, Sansonetti PJ, Dramsi S. Colorectal cancer specific conditions promote *Streptococcus gallolyticus* gut colonization. Proc Natl Acad Sci U S A. 2018 Jan 9;115(2):E283-E291. doi: 10.1073/pnas.1715112115

RESUME DU PROJET PROPOSE ET TECHNIQUES ENVISAGEES (MAXIMUM 1 PAGE) :

***Streptococcus agalactiae*, or group B streptococcus (GBS),** is a commensal bacterium present in the gut microbiota of 30% of the population. GBS can cross biological barriers and cause **serious systemic infections** in vulnerable individuals, such as the elderly or newborns. It is indeed the **leading cause of neonatal bacterial meningitis in the world**. The only preventive strategy currently available is intrapartum antibiotic prophylaxis (IAP), which is recommended for any women carrying the bacterium, to reduce the risk of mother-to-child vertical transmission. Yet, this strategy does not reduce the incidence of late onset disease (LOD), which occurs during the first 3 months after birth. In addition, it may also increase the risk of antibiotic resistance and impair the proper establishment of the neonatal microbiota. To propose alternatives to antibiotics to prevent GBS infection, it is crucial to study the pathogenicity mechanisms of **GBS, and more specifically its interaction with biological barriers such as the intestine**, a major reservoir for this opportunistic bacterium.

Combining *in vitro* and *in vivo* approaches, we recently showed that the **enteric nervous system** is involved in promoting GBS association with the epithelium and its systemic translocation. Our aim is to better define the role of enteric neurons in GBS interaction with the intestinal epithelium. More specifically we aim **1/** to identify the molecules produced by enteric neurons involved in enhancing GBS association with the intestinal epithelium **2/** to understand the impact of such molecules on GBS intrinsic virulence and/or interaction with intestinal epithelial cells. To achieve this goal, a combination of *in vitro* (cultures of intestinal epithelium with enteric neurons) and *in vivo* models will be used. We will also use microbiological tools (GBS isogenic mutants, GBS reporter strains) to better define the role of GBS virulence factors in its interaction with the gut barrier.

This project is an emerging topic in the TENS laboratory (https://www.inserm-tens.com/home), fully funded by an ANR JCJC. Motivated candidates willing to pursue a PhD after their master degree (possibilities to apply to fellowships), and to take part in the development of an exciting research project in an inspiring environment are encouraged to apply.

TECHNIQUES ENVISAGEES :

CULTURE OF INTESTINAL EPITHELIAL CELLS AND ENTERIC NERVOUS SYSTEM

GROUP B STREPTOCOCCUS INFECTION MODELS (IN VITRO, IN VIVO)