**M2iSH, UMR 1071 Inserm/Université Clermont Auvergne, USC INRAE 2018 (Pr Barnich)**

**PhD supervisor :** Anthony Buisson (MCU-PH-HDR), **PhD co-supervisor** Delphine Boucher (MCU)

anthony.buisson@uca.fr

**Impact of pollutants on pathogenic Escherichia coli colonization involved in intestinal chronic diseases**

Pollution plays a major role in the development of inflammatory bowel disease (IBD) and colorectal cancer (CRC) through changes in the structure and functioning of the gut microbial ecosystem. Any modifications of the intestinal microbiota, due to changes in the digestive environment, can therefore lead to the appearance of pathologies. There is growing evidence that the presence of contaminating molecules could be involved in the structure and functioning of the intestinal microbial ecosystem and, consequently, in the development of chronic inflammatory pathologies by potentially promoting the emergence of pathogens such as *E. coli* B2. Therefore, this PhD project aims to characterize, in response to contamination by TiO2 particles, the intestinal micro-inflammatory environment, the bacterial population alterations of the digestive ecosystem, but also to study the colonization capacity of *E. coli* B2 at the level of the murine intestinal mucosa. Indeed, TiO2 is particularly monitored due to its carcinogenic properties and its ubiquity in the environment in the form of micro and nanoparticles (food, cosmetics...). This project is part of the national cross-disciplinary "Microbiota" program at Inserm which aims to study the intestinal ecosystem as a key determinant in health and the development of pathologies.

***Buisson A et al.*** *(2019). Macrophages Inability to Mediate Adherent-Invasive E. coli Replication is Linked to Autophagy in Crohn's Disease Patients. Cells.*

***Ribiere et al.*** *(2016) Oral exposure to environmental pollutant benzo[a]pyrene impacts the intestinal epithelium and induces gut microbial shifts in murine model. Sci. Rep.*