Impact of diet-derived siderophores on the gut microbiota

Emma Blondeaux*[1], Olivier Cunrath[1], Emmanuel Boutant[1], and Ludivine Valois[2]

[1]Biotechnologie et signalisation cellulaire – université de Strasbourg, Centre National de la Recherche Scientifique – France

[2]Institut Pluridisciplinaire Hubert Curien – université de Strasbourg, Université de Haute-Alsace (UHA) Mulhouse - Colmar, Institut National de Physique Nucléaire et de Physique des Particules du CNRS, Centre National de la Recherche Scientifique – France

Résumé

The gut microbiome provides essential functions such as colonisation resistance against invading pathogens, but food-derived metabolites can disturb its homeostasis and cause dysbiosis–and therein, loss of function. Siderophores (iron-chelating molecules) are an example of metabolites present in some fermented foods–the utilisation of these exogenous siderophores by gut bacteria may shape colonisation resistance.
Within the broader aim of studying siderophore-mediated colonisation resistance, my project aims to determine whether gut bacteria can utilise siderophores present in fermented foods, focusing on those produced by cheese microorganisms.

Firstly, we aim to identify which siderophores are produced by key fungal species. This involves culturing cheese-derived fungi in iron-depleted medium to characterise the siderophores they produce using HPLC-MS/MS. Preliminary results confirmed metagenomic findings regarding the production of rhizoferrin, fusarinine, and coprogen by fungal strains.
Secondly, we aim to develop a qualitative spotting assay for the rapid screening of exogenous siderophore utilisation by gut bacteria. Two *Fusobacterium* strains tested seem able to utilise salmochelin, a siderophore produced by pathogenic Enterobacteriaceae. The optimisation of growth conditions in liquid minimal medium will allow us to confirm and quantify this initial result.

Mots-Clés: Siderophores, Microbiota, Colonisation resistance

*Intervenant