

## Research Unit: Analytical BioGeoChemistry (BGC)

### Highlight/Publication:

Sulfonolipids as novel metabolite markers of *Alistipes* and *Odoribacter* affected by high-fat diets

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### PSP Element:

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### Keywords:

Biological markers, Sulfolipides, New Bioactives, Nutrition, *Alistipes*, *Odoribacter*

### Central statement of the highlight in one sentence:

We discovered and described new sulfolipid compounds out of gut Microbiomes that could be associated specifically to *Alistipes* and *Odoribacter*.

### Text of the highlight:

The gut microbiota generates a huge pool of unknown metabolites, and their identification and characterization is a key challenge in metabolomics. However, there are still gaps on the studies of gut microbiota and their chemical structures. In this investigation, an unusual class of bacterial sulfonolipids (SLs) is detected in mouse cecum, which was originally found in environmental microbes. We have performed a detailed molecular level characterization of this class of lipids by combining high-resolution mass spectrometry and liquid chromatography analysis. Eighteen SLs that differ in their capnoid and fatty acid chain compositions were identified. The SL called "sulfobacin B" was isolated, characterized, and was significantly increased in mice fed with high-fat diets. To reveal bacterial producers of SLs, metagenome analysis was acquired and only two bacterial genera, i.e., *Alistipes* and *Odoribacter*, were revealed to be responsible for their production. This knowledge enables explaining a part of the molecular complexity introduced by microbes to the mammalian gastrointestinal tract and can be used as chemotaxonomic evidence in gut microbiota.

### Taking account of the HMGU mission:

Gut Microbiome and human health, novel biomarkers, understanding gut microbiota on the molecular level.

**The internal HMGU co-operation partners with whom the highlight was compiled, if appropriate**

This is a work that was followed in an interdisciplinary research within the "mouse200" study at Helmholtz Zentrum Muenchen involving different institutes and research units with lead at BGC.