

**« How mutualism evolves:
Dissecting the role of the host in microbiota evolution »**

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Metazoans harbour considerable numbers of commensal microorganisms in the gut, named microbiota, which contribute to many aspects of host physiology. One important aspect is their ability to promote host growth. Nevertheless, the molecular mechanisms underlying microbiota's beneficial influence are still largely undefined.

Our project integrates microbial evolution, meta'omics and the use of model organisms to understand how evolution shapes animal/microbe symbiosis and to identify the bacterial genomic signatures mediating host growth.

Specifically, by applying experimental evolution to a well-established model of facultative symbiosis - *Drosophila melanogaster* associated with *Lactobacillus plantarum*, one of its growth promoting symbionts - we showed that the diet, instead of the host, is the predominant driving force in the evolution of this symbiosis. Following these observations, we asked what is the role of the animal host in the evolution of its mutualists.

To test this hypothesis, we developed parallel experimental evolution of *L. plantarum* with and without *Drosophila*. I will report the results concerning the role of the host in the evolution of its bacterial symbionts over twelve generations, both in terms of growth, symbiotic effect and microbiota genetic evolution.