Symposium “Towards Eco-Evolutionary Dynamics in Bacteria”

Organisers: Santiago Castillo & Esperanza Martínez

Invited speaker: Jesse Shapiro, Université de Montréal, Canada

The constant decline of sequencing costs has made it possible to analyze large numbers of bacterial strains and, therefore, to study diverse populations and communities of bacteria to an unprecedented level of resolution. Rapid progress has been made in population genomics, metagenomics and experimental evolution; these disciplines have made significant contributions to either microbial ecology or microbial evolution yet, unfortunately, few studies have tried to integrate ecology and evolution perspectives. In this regard, there is the commonly unsubstantiated assumption that ecological dynamics occur way faster than evolutionary processes. However, at least in bacteria, it is clear that evolutionary and ecological processes occur at similar time scales, as bacteria can change drastically their genotype during their lifespan due to rapid loss or gain (generally through horizontal gene transfer) of genes. Frequently, these gene acquisitions/losses alter the functional capacity of bacteria, which in turn impacts on the bacteria’s potential to occupy new/different niches. Thus, thinking about eco-evolutionary dynamics makes much more sense than just focusing on either evolutionary or ecological perspectives (particularly at micro evolutionary scales). Importantly, none of the disciplines mention above is fully capable of tracking eco-evolutionary processes in bacteria and a serious attempt to integrate them is required. This symposium will bring together people working on population genomics, metagenomics and experimental evolution to combine the knowledge from these three areas into a more coherent understanding of the eco-evolutionary dynamics in bacteria. This symposium will add to theme of how the evolutionary and ecological processes interact with one another.