# Whiteflies as a model to study multi-trophic interactions.

Studying multi-trophic interactions in whiteflies has been the main driver of my research. First, I will give a brief introduction to whiteflies, their symbionts, and their agricultural relevance. Then, I will explore the co-evolution of whiteflies with their bacterial symbionts. Indeed, whiteflies rely on their primary endosymbiont Candidatus Portiera aleyrodidarum (Portiera) to obtain essential amino acids not present in their plant-sap diet. Not surprisingly, Portiera has been co-diverging with whiteflies since their origin, reflecting their host evolutionary history. Interestingly, in a specific lineage of whiteflies, Portiera presents a phenomenon termed “genome instability”. This instability can be interpreted in the context of whiteflies' development and Portiera maternal transmission.
For the second part of my talk, I will discuss how the gut microbiota of the sweet potato whitefly Bemisia tabaci might be involved in the host-plant switching process. B. tabaci is a generalist insect and requires the ability to quickly overcome different sets of host plant defence compounds. Our results suggest that B. tabaci acquires different gut-associated bacteria from the environment. Some of them had the potential to degrade different defence compounds from plants. Like phenotypic plasticity, acquiring gut bacteria is a fast process that can aid B. tabaci to deal with non-suitable host plants.
Finally, I will present some preliminary data on the GuardSym project. In this project, I investigate if different symbionts can block the transmission of plant viruses by B. tabaci (virus-resistant phenotypes). If succeed, the data generated will form the basis for the development of symbiont-based population modification strategies in whiteflies. Replacing natural populations with virus-resistant ones will help to reduce the economic impact caused by whiteflies.