Line 2 – Conservation and sustainability

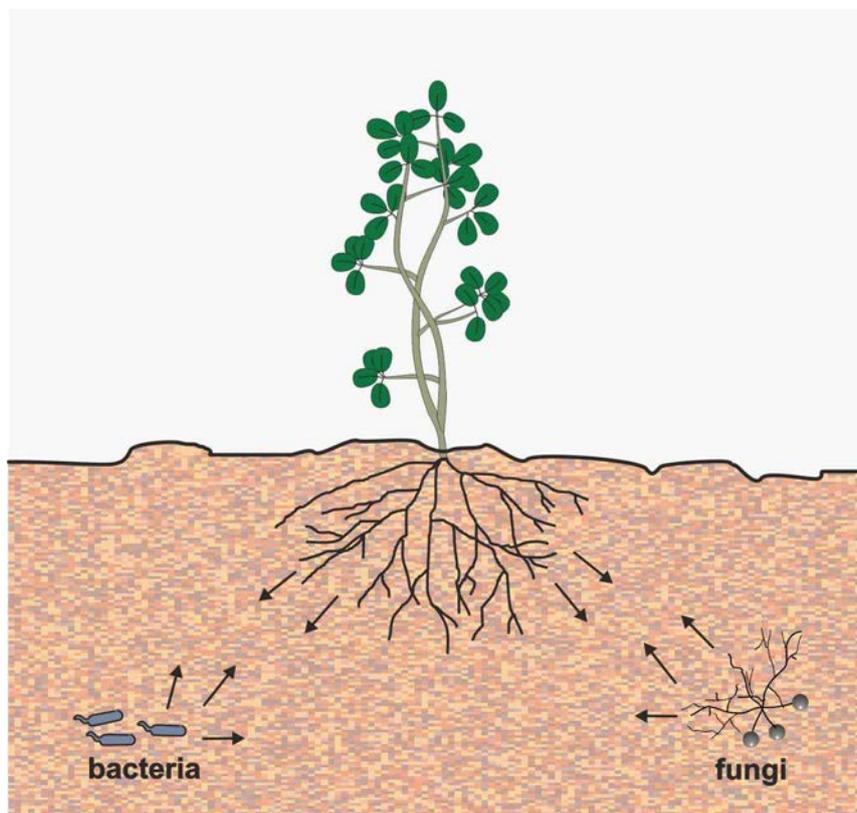## DECODING MOLECULAR DIALOGUES IN PLANT-MICROBE SYMBIOSES

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Project description

The project aims to analyse the signalling mechanisms underlying two of the most important beneficial plant-microbe interactions – the nitrogen-fixing symbiosis and the arbuscular mycorrhizal (AM) symbiosis. In particular, it is proposed to dissect the symbiotic signalling pathways activated in the microbial partners by plant-derived molecules (*i.e.* flavonoids and strigolactones). Bacteria and fungi involved in these symbioses provide plants with essential mineral nutrients, increasing crop yields and favoring a sustainable agriculture, through a drastic reduction of the need for chemical fertilizers.

A detailed analysis of the molecular determinants of plant-microbe symbioses may improve, via modulation of these communication circuits, the ability of microorganisms to interact with plants and/or the ability of plants to take advantage of these interactions. Insights into basic processes underpinning communications between plants and beneficial microbes are essential to develop future strategies to improve plant nutrition and stress resistance, in order to meet an ever increasing demand on a sustainable and secure food production.

This project is carried out in collaboration with Prof. Andrea Squartini (University of Padova, Italy) and Prof. Paola Bonfante and Andrea Genre (University of Turin, Italy).

Molecular dialogues in plant-microbe symbioses.