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Latvian Biomedical Research Centre (BMC) & University of Latvia

Summary of the research conducted within your group

Our emerging Molecular Plant-Microbe Interactions (MPMI) Research group (Orlovskis Lab) at BMC Latvia aims to uncover novel molecular mechanisms involved in inter-plant signalling mediated by underground common mycelial networks (CMN). We combine genomic, transcriptomic and metabolomic approaches with plant pathogen assays to study the effects of stress-induced inter-plant signals on receiver plant pathogen resistance, growth and physiology. Furthermore, we explore hypothesis that CMNs mediates and contributes to inter-tree stress responses using two economically important crops in Nordic countries – silver birch and hybrid aspen. Additionally, we have undertaken the characterisation and isolation of novel endemic plant growth promoting bacteria and mycorrhizal fungi to expand the species breath in our functional experiments and explore prospective commercial applications.

Research trajectory

The long-term goal of the research group is to understand how intra-plant and inter-plant systemic signals affect and are shaped by plant beneficial microbiota in order to help plant defences against pest and pathogen attacks. Our ambition is to make fundamental discoveries in model plants (*Medicago truncatula, Arabidopsis thaliana, Daucus carota*) as well as economically important crop species that could become new crop and tree models in the future. The application of our research is aimed at sustainably engineering and supplementing plant microbiota to boost defences in high yielding cultivars where genetic breeding or engineering may be challenging or yet limited.