Elucidating root metabolite secretion and rhizosphere implications

It is well known that root metabolite secretions are critical factors for rhizosphere microbiomes. Yet, there is only a limited of the chemical identity of root-secreted metabolites for specific plants and how secretion may react to different growth conditions. There is a knowledge gap about the presence and identity of secreted bioactive ‘specialized metabolites’ produced by the plant. For this study, we used LC-MS/MS-based metabolomics and defined hydroponic cultures of different tomato and wheat genotypes to elucidate core root-secreted metabolites and how the profile of secreted metabolites changes in response to plant stress. We found stress and plant genotype-independent root secretions (constitutive exudation). At the same time, we could decipher stress and genotype-specific shifts in the secreted metabolite profiles. Constitutive and stress-adaptive shifts in root secretions likely link to core microbiomes and stress-induced changes in microbiomes.