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W252 - Molecular bases of the interactions between clover plants and *Novosphingobium* sp. HR1a during rhizoremediation.

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Abstract Content

Rhizoremediation is based on the ability of microorganisms to metabolize nutrients from plant root exudates and, thereby, to co-metabolize or even mineralize toxic environmental contaminants. *Novosphingobium* sp. HR1a is a good biodegrader of polycyclic aromatic hydrocarbons (PAHs) and other aromatic compounds, and also a good colonizer of rhizospheric environments. The main objective of our research is to investigate the molecular interactions between clover plants and the bacteria, *Novosphingobium* sp. HR1a, during rhizoremediation. For this, we used a combination of physiological, transcriptomic and chemical methodologies. We have demonstrated that this microbe is able to co-metabolize PAHs and nutrients exudated by clover roots, being this ability mediated by the action of the PahT regulator. Furthermore, the bacterial genes responsible for PAH degradation are induced in the rhizosphere, and we have identified the individual carbon sources, among those exuded by the clover plants, that induced these genes.

Clover root morphology is altered in the presence of *Novosphingobium* sp. HR1a. However, in the presence of a mutant in the LuxR-solo regulator, LuxR874, root morphology is recovered. We have found a good correlation between some plant hormone levels, the root architecture and the presence/absence of the wild-type or mutant bacteria. Our data suggest that LuxR874 is a repressor of QS responses in *Novosphingobium* sp. HR1a. We are now studying the implications that this phenotype might have during rhizoremediation of PAHs.