

# A different point of view of plant-bacterial interactions: RNA-Seq analysis of a PGP bacterial endophyte colonizing rapeseed plants

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**Abstract:** Some microbes are important players in plant's fitness, contributing to their nutrients acquisition and protection against diverse biotic and abiotic stresses<sup>1</sup>. Despite the vast knowledge acquired during the last decades about the effects in plants of plant growth promoting (PGP) bacteria<sup>2</sup>, apart from those of the legume-rhizobial interactions<sup>3</sup>, not much is known about the response of bacteria to the interaction with plant. With the aim to decipher the transcription profile of a non-rhizobial strain in its interaction with the plant, a PGP *Pseudomonas* strain isolated from *Brassica napus* roots and capable to protect the plant against biotic and abiotic stresses was inoculated onto rapeseed seedlings. Eleven days post-inoculation, we obtained the RNA-Seq profile of bacterial cells colonizing the seedlings' roots. RNA from free living cells was used as control. Our analyses allowed us to identify 1378 bacterial genes differentially expressed (log<sub>2</sub> fold change > 2; adjusted p value < 0.05). Most overexpressed genes in the interaction are related to biofilm formation, bacterial immunity and infection and bacterial survival to antimicrobial compounds -likely excreted by the plant-. However, genes implicated in PGP traits which had been previously demonstrated *in vitro* for this strain, appeared to be not significantly overexpressed, suggesting a latter PGP action in the interaction. Based on this RNA-Seq experiment, our results shed light into bacterial mechanisms to effectively colonize plant roots, to survive to plant defense mechanisms as well as to promote plant immunity.

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<sup>1</sup>Menéndez, E., & Garcia-Fraile, P. (2017). *AIMS microbiology*, 3(3), 502.

<sup>2</sup>Hayat, R., et al., (2010). *Annals of microbiology*, 60(4), 579-598.

<sup>3</sup>Oldroyd, G. E., et al., (2011). *Annual review of genetics*, 45, 119-144.

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