**Ethylene inhibits cell cycle progress in root hairs of *Lotus japonicus* infected by rhizobia**

Liang W.1, 2, Niu H.4, Xu P.4, Gresshoff P.5, and Murray J. D. 1, 3

Corresponding author: Email: jeremy.murray@jic.ac.uk

1 Centre of Excellence for Plant and Microbial Sciences, Chinese Academy of Sciences, China

2 University of Chinese Academy of Sciences, China,

3 Cell and Developmental Biology, John Innes Centre, United Kingdom

4 College of Life Sciences, Shanghai Normal University, China

5 Australian Research Council Centre of Excellence for Integrative Legume Research, The University of Queensland, St. Lucia, Brisbane Australia

The symbiotic bacteria *Mesorhizobium loti* typically gains entry to its host *Lotus japonicus* by means of infection threads, tubular invaginations that serve as transcellular passageways through root hairs, that form through the physical remodelling of the cell wall and membrane. During rhizobial infection numerous cell division genes are induced, suggesting at least partial engagement of cell cycle related processes to provide an invasive impetus, involving reorganization of the cytoskeleton and enlargement of the nucleus [1, 2].

Here we show that ETHYLENE RESPONSE1 (ETR1) is involved in cell cycle regulation during infection thread establishment. We found that the ethylene insensitive mutant LjETR1-1 displays an enlarged, irregular shaped nucleus in infected root hairs, which is sometimes associated with blocked infections. We show that despite the nuclear enlargement that occurs in wild type infected cells, no *de novo* DNA synthesis takes place, while in LjETR-1 these cells enter S phase, highlighting a new role for ETR1 in the direction of cell cycle processes during symbiotic infection.

***References:***

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