LEGUMES

Symbiosis gatekeeper

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Legumes host rhizobia bacteria in tailor-made root nodules. Both organisms form a partnership that gives the plant access to atmospheric nitrogen in exchange for sugars. Nodulation involves the initiation of developmental programs for organ formation and bacterial accommodation. The establishment of symbiosis follows a precise scenario, in which a new twist has just been discovered.

One of the plant adaptations is an increase in symplastic cell-to-cell communication in the developing nodule. In *Medicago truncatula*, Fernanda de Carvalho-Niebel and colleagues demonstrate that this is due to callose turnover at plasmodesmata, which is necessary for the correct development and colonization of nitrogen-fixing nodules.

Plasmodesmata communication is controlled by the opposite local functions of callose synthases and β -1,3-glucanases (BG). The authors focus on one of the latter,

M. truncatula BG2. Its enhanced expression after rhizobial inoculation correlates with a decrease in callose in the same tissues, and an increase in symplastic connectivity. Plants overexpressing BG2 display more nodules. On the other hand, obstructing plasmodesmata or knocking down BG2 reduces the number of colonized nodules and the expression of key symbiosis genes.

This study emphasizes the importance of non-cell autonomous communication routes during important biological and developmental processes, such as the establishment of symbiosis. In the case of legume root nodules, the next step will be to find which of the many potential mobile molecules are involved.

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