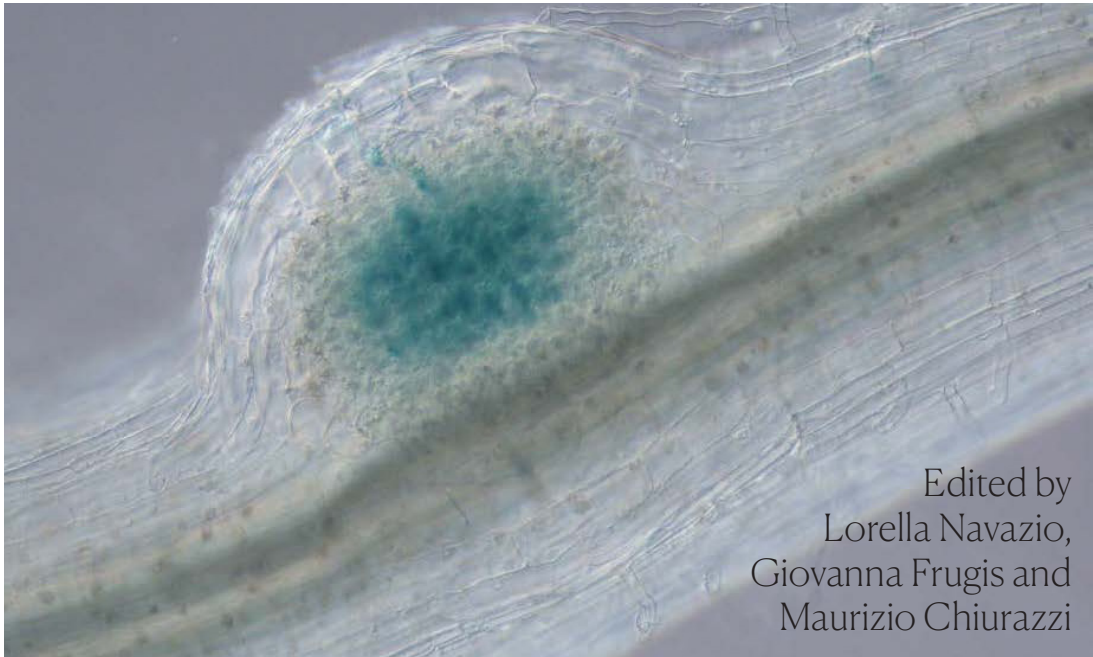


Biological Nitrogen Fixation

Virtual Issue

Journal of
Experimental
Botany



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Biological Nitrogen Fixation

Symbiotic associations between plants (mostly legumes) and nitrogen-fixing bacteria result in the reduction of atmospheric nitrogen (N_2) into biologically useful forms within host plant roots through the process called “biological nitrogen fixation” (BNF). The establishment of this symbiosis involves chemical and physical interactions between the partners, as well as complex signalling and regulatory processes underlying major changes in gene expression, at the same time suppressing plant defence responses. In legume roots, the BNF takes place in a specialized niche, the N_2 -fixing nodule where optimal conditions for the reduction of the atmospheric N_2 are established. Nodule organogenesis and N_2 -fixation are very expensive processes supported by photosynthate products, which must be strictly regulated to maintain a convenient

balance between the influx of nitrogen and the efflux of carbon compounds. Despite the remarkable progress in this field, much remains to be learned about the genetics and molecular biology of legume-rhizobia interactions, regulatory networks underlying nodule initiation, organogenesis and functioning and molecular bases that prevent non-legume plants to establish symbiosis for BNF.

This virtual issue, which will be published in association with the 15th European Nitrogen Fixation Conference (ENFC) (August 31–September 3, 2023, Naples, Italy), will focus on the latest plant-oriented advances in the BNF field. The aim is to provide an up-to-date scenario of the cellular, biochemical and molecular aspects of this fundamental process that, through a drastic and environmentally friendly reduction in the input of

nitrogen fertilizers, plays a key role for the sustainability of agroecosystems and food security strategies.

Invitation to submit

Reviews and research papers dealing with the current state of the art, as well as future challenges in the field, are welcome. If you would like to submit a paper, please [email](#) a title and brief outline for the consideration of the guest editors. All papers are subject to the usual standards of peer review and must fit the scope of the journal.

Accepted manuscripts will be published in regular issues of JXB, and the complete set of published manuscripts will then be presented together in a Virtual Issue, alongside an editorial written by the guest editors.

The deadline for submissions is 30 September, 2023.

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On the reverse: Nomarski microscopy image of a 5 d postinoculation (5 dpi) *Medicago truncatula* nodule induced with a *Sinorhizobium meliloti* strain expressing a lacZ reporter gene (courtesy of Giovanna Frugis).

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