B14. Identification of a key protein in the control of *Sinorhizobium meliloti* life on surfaces

Lydia Bernabéu-Roda¹, Nieves Calatrava-Morales¹, Virginia Cuéllar¹, Elizaveta Kro¹,²,³, Anke Becker²,³, and María J. Soto¹

¹Estación Experimental del Zaidín (CSIC), Profesor Albareda 1 Granada (Spain), ²Center for Synthetic Microbiology (SYNMIKRO), Philipps-Universität Marburg, Marburg (Germany), ³Department of Biology, Philipps-Universität Marburg, Marburg (Germany)

E-mail: mariajose.soto@eez.csic.it

*Sinorhizobium* (Ensifer) *meliloti* emits volatile compounds with relevant biological properties¹. One of them, 2-tridecanone (2-TDC), acts as an infochemical affecting surface-associated bacterial behaviors such as motility and biofilm formation through a still poorly understood mechanism². In *S. meliloti*, the presence of volatile 2-TDC promotes a mode of surface translocation, which is largely flagellum-independent². To identify bacterial genes important in the mechanism of action of 2-TDC, *S. meliloti* transposants insensitive to this compound were isolated. One of the mutants is affected in a gene, *mkiG*, that encodes a protein with domains characteristic to proteins involved in cyclic diguanilate (c-di-GMP) metabolism. The mutant shows swimming motility similar to the wild type strain but is impaired in surface translocation and unable to respond to volatile 2-TDC. In addition, the mutant exhibits increased biofilm formation, strong Congo red staining, and increased levels of c-di-GMP, but it establishes symbiosis with alfalfa plants as effectively as the wild type strain. The characterization of mutants with different deleted versions of *mkiG*, complementation experiments, and isolation of mutations that suppress the *mkiG*’s mutant phenotypes, demonstrate that c-di-GMP homeostasis is fundamental in the mechanism of action of 2-TDC and indicate that MkiG is a bifunctional protein, which is crucial in the control of phenotypes associated with bacterial life on surfaces.

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References

Abstract Booklet

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