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Escherichia coli as gene donor in transgenic plant technology

Katherine M. Pappas
University of Athens, Greece

Abstract

Agrobacterium tumefaciens is the bacterial vector of choice for the transfer of transgenes to plant recipients. We here report that *Escherichia coli* can also act as a transgene donor and achieve *Arabidopsis thaliana* transformation in plant by the flower dip method, in collaboration with an *A. tumefaciens* helper strain. This process, which has been described before for *Nicotiana tabacum* explant tissue transformation , entails *in situ* conjugal transfer of the transgene from *E. coli* to *A. tumefaciens*, and then to the plant. In the case of *Arabidopsis*, this process quite surprisingly takes place on intact plant flower surfaces. By employing a most yielding *A. tumefaciens* strain and by optimizing bacterial mating procedures and numbers, transformation frequencies that fall within the lower limits of standard *A. tumefaciens*-mediated gene transfer are achieved. This is a novel approach in transgenic plant technology; it is simpler, faster, and particularly promising for the transfer of large and unstable DNA fragments.

Biography

Katherine M. Pappas completed her under- and postgraduate studies at the University of Athens, Greece (UoA) and postdoctoral work at Cornell University, NY. She is currently an Assistant Professor at UoA. She has served as an elected administrative member in UoA, consultant for the Greek Ministry of Health (EFET), proposal evaluator in Greece and the EU, and *ad hoc* or permanent reviewer in high impact-factor journals. She is a member of many Scientific Societies, current US DOE-JGI collaborator in two projects, and author of research papers, reviews and book chapters.