Application of *Agrobacterium tumefaciens* as a Tool for Genetic Transformation in Filamentous Fungi

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Abstract

The expression of a set of *Vir* genes located on the tumor-inducing (Ti) plasmid of *Agrobacterium tumefaciens* is triggered by phenolic compounds secreted from wounded plant cells. Their expression results in the T-DNA on the Ti plasmid replication and transferring to the host plant. T-DNA encodes enzymes to produce plant growth regulators, which cause uncontrolled cell proliferation and crown gall formation. The *Agrobacterium*-mediated transformation method results in higher transformation efficiency for fungi when compared to traditional methods. It is because Vir protein E2 protects T-DNA against nuclease degradation in the host cell as well as the Vir protein D2 plays a role in repairing DNA damage after T-DNA integration into the host genome. *Agrobacterium tumefaciens* has been widely used for gene replacement in recent years. The experiments for the gene replacement require the generation of gene replacement cassettes, which consist of a selectable marker gene flanked with DNA fragments homologous to the target gene. In terms of efficiency of targeted integration, researchers have found that not only the length of the homologous DNA fragment but also the DNA sequence itself is an important factor.

Key words：*Agrobacterium tumefaciens*, Genetic Transformation, Filamentous fungi

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