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Transformation of Tomato

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1. Introduction

Since 1986, when Beachy and coworkers ***(1)*** first published a protection of transgenic tobacco plants expressing the tobacco mosaic virus (TMV) coat protein (CP) against TMV infection, transgenic plants have become an important tool in plant virology. Coat protein transgenic plants have been used successfully to obtain protection against many different plant viruses ***(2)***. In addition, transgenic plants expressing viral gene products can be used to study the function of one particular gene in the viral life cycle or in the interaction with specific host plants.

Most of these experiments have been conducted with tobacco as a model plant. A plant species of great commercial importance, which is affected by many viral diseases, is tomato (*Lycopersicon esculentum* Mill.). Since tomato can be transformed using *Agrobacterium*, it is a good choice as an alternative to tobacco for studying viral gene function in transgenic plants. However, in contrast to tobacco, there is a considerable variation in the tissue culture performance of different tomato cultivars. The method described here was optimized in our laboratory for the transformation of greenhouse tomato cultivars like Craigella and Moneymaker. It is based on protocols developed by Filatti and coworkers ***(3)*** and by Smith et al. ***(4)***.

2. Materials

1. *Agrobacterium* strains: For transformation of tomato the *Agrobacterium tumefaciens* strain LBA4404 was used, which harbors the severely deleted Ti plasmid pAL4404. This Ti plasmid serves as a helper for the transfer of the T-DNA from a second (binary) plasmid that contains the selectable marker and the gene of interest. We use the binary plasmid, pBin19 ***(5)***, and derivatives of this plasmid.

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