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Transient Expression of Green Fluorescent Protein in Rice Calluses : Optimization of Parameters for Helios Gene Gun Device

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Abstract: An optimized condition for particle bombardment is necessary for efficient genetic transformation. Parameters for Helios gene gun, the new system for nucleic acid delivery which is mainly consists of hand-held device sold by Bio-Rad Laboratories (California USA), were examined based on transient expression of synthetic green fluorescent protein (*sgfp*) in rice calluses of *indica* cv. Fatmawati and *japonica* cv. Nipponbare. In the experimental conditions that we examined, parameters found to be the most favorable conditions for transient expression of *sgfp* in rice callus cells were as follows: 200-250 psi helium pressure, 0.6 µm gold particle size, 0.25 mg gold particles per shot, and 1.5 µg plasmid-DNA per shot. Desiccation of callus cells for eight min was also found appropriate. The level of transient *sgfp* expression was not significantly influenced by the pre-culture for 4 to 12 d before bombardment or by callus age between 10 and 33 wk old in Fatmawati. These parameters for this particular device should improve the transient expression, thus enabling stable expression of introduced genes via Helios gene gun using callus as a target tissue.

Keywords: Helios gene gun, Particle bombardment, Rice, Synthetic green fluorescent protein, Transient expression

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