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Marker Gene Delivery to Mature Wheat Embryos Via Particle Bombardment

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**Abstract:** The possibility of transferring genes to mature wheat embryos ( *Triticum aestivum*L. and *T. durum* Desf.) via accelerated and DNA-coated tungsten particles was investigated. Mature embryos isolated from bread (cv. Atay) and durum (cv. Çakmak) wheat were utilised as targets for bombardment. DNA in the form of circular plasmid (pBSGUSINT) was precipitated on tungsten particles (ca. 2 µm diameter) using the calcium nitrate method. Mature embryos were bombarded by a microprocessor-controlled particle delivery instrument (GENEBOOSTER TM ) driven by compressed nitrogen gas. Bombardment was carried out at various gas pressure and in a chamber vacuum. The target material was subjected to histochemical GUS staining 24 hours after bombardment or 7 days after the initial germination of the embryos. Almost 80% of the bombarded embryos expressed the transferred GUS gene observed through blue colour formation on the embryos. Negative controls (non-bombarded embryos or embryos bombarded with bare tungsten particles) did not exhibit GUS activity. Seven-day-old seedlings which had emerged from bombarded material also exhibited patches of GUS staining, indicating the integration and expression of the transferred GUS gene to the genome of some tissue segments. The optimised bombardment method is currently in use to obtain transgenic wheat cultivars.

**Key Words:** wheat, mature embryo, transformation, particle bombardment, GUS

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