

**[BIO08]**

**Development of a transformation system for *Gracilaria changii* (Gracilariales, Rhodophyta), a Malaysian red alga via microparticle bombardement**

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Rhodophytes, especially the *Gracilariaceae*, are the main source of phycocolloids such as agar and agarose. About 100 species of *Gracilaria* are widely distributed throughout tropical and temperate waters of the world. In Malaysia, *Gracilaria changii* (Xia et Abbott) Abbott, Zhang et Xia is one of the most abundant agarophytic seaweeds and has the potential to produce good food grade agar. Genetic engineering will enhance the utilisation of this economic seaweed and spur the development of algal biotechnology in Malaysia. Using a Biolistic PDS 1000/He system, healthy thalli of *Gracilaria changii* were bombarded with gold particles coated with plasmid DNA containing the *lacZ* and *GUS* reporter genes. Transient expression of *lacZ* was observed in bombarded thalli under the rupture-disc pressures of 4482, 6206, 7584 and 8963 KPa two days after bombardment. PCR verification indicated the integration of the foreign gene (*lac Z*) into the genomic DNA(s) extracted from two month-old bombarded thalli of *G. changii*. Similar results were obtained with *Agrobacterium*-mediated transformation in *G. changii* using the same plasmid. The results indicate that *lacZ* could be a useful reporter gene and that SV40 promoter could be an effective promoter for *Gracilaria* transformation. This is the first successful transformation of a tropical red seaweed. The only other successful transformation reported is that of *Laminaria* a temperate brown seaweed, from China.