Development of Pollen-Derived Edible Vaccine

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In plant transient system to produce foreign proteins of a high value, recombinant DNA can be delivered to cells, tissues, or whole plants by particle bombardment, agroinfiltration or viral vector inoculation[1)]. These DNA delivery method can be applied also to pollen grains[2)]. In this study, agroinfiltrated lily (*Lilium longiflorum*) pollen was examined for CaMV35S promoter fused β-glucuronidase (GUS) gene expression. Lily pollen grains were evenly dispersed onto pollen growth medium, agroinfiltrated, incubated for 16 hr and treated with cefotaxime for 4 hr, subsequentially. From the pollen tube cultures, GUS gene expression was confirmed by Southern hybridization, histochemistry and RT-PCR[3)]. Pollen transgenesis was applied for the preparation of edible vaccine sources against Hepatitis B virus (HBV) which is accountable to significant morbidity throughout the world. Recombinant DNA encoding HBV surface antigen (HBsAg) was introduced into lily pollen by agroinfiltration and its expression was assured by molecular analysis for nucleic acid as well as HBsAg-specific ELISA. Balb-C mice which were fed with transgenic pollen cultures successfully showed production of antibody in serum specific to HBsAg. The transgenic lily pollen culture may be utilized as an economical edible vaccine materials with advantage of easy and rapid preparation.

References

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