Molecular Breeding R.G., BioGreen 21 Program, RDA (Ramada Plaza Jeju, November 2-3, 2005)

과제 일련번호: 19

Expression of the spike protein of porcine epidemic diarrhea virus in transgenic cultured cells and plants

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Porcine epidemic diarrhea virus (PEDV) is an infectious and highly contagious swine virus, which belongs to the *Coronaviridae* family. PEDV causes enteritis in swine of all ages, and is fatal in neonatal piglets. Hence, it is important to develop an effective vaccination against PEDV infection. The spike protein of PEDV is a primary target antigen for developing an effective vaccine against coronaviruses, since it mediates essential biological functions. In this study, in order to develop the transgenic tobacco cultured cells and sweetpotato plants that produce the plant-based antigen, we constructed the transformation vectors expressing the spike protein of PEDV under the control of CaMV 35S promoter or sporamin promoter. Transgenic tobacco (cv. BY-2) cultured cells and sweetpotato [*Ipomoea batatas* (L.) Lam. cv. Yulmi] embryogenic calli were successfully developed by an *Agrobacterium tumefaciens*-mediation. Individual kanamycin-resistant calli were selected on MS medium containing 100 mg/L kanamycin and 400 mg/L claforan (selection medium), and were subcultured to the same selection medium at 3 weeks interval. Transgenic tobacco cell lines that express high levels of PEDV antigen were screened and confirmed by dot-blot and northern blot analysis. Kanamycin-resistant embryogenic calli of sweetpotato transferred to hormone-free MS medium containing kanamycin gave rise to somatic embryos and then converted into plantlets in the same medium. The putative transgenic sweetpotato plants were confirmed by PCR and Southern blot analysis. The expression levels of PEDV antigen were screened by northern and western blot analyses. The further characterization of transgenic tobacco cell lines and sweetpotato plants, and activities of the plant-derived antigen are under study.

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† 주관과제명 (과제책임자): 돼지 유행성 설사병 예방을 위한 항원단백질 생산 형질전환 고구마 개발 (한국생명공학연구원 이행순)

‡ 총연구기간 (년차): 2004년 - 2006년 (2년차)