

Characterization of Functional Humanized Tumor Associated Antigen-72 antibody in Transgenic Rice Cell Suspension Culture

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ABSTRACT

In order to produce humanized F(ab')₂ antibody with an antigen specificity for tumor associated glycoprotein-72 (TAG-72) was used. The humanized F(ab')₂ antibody gene was carried by a plant expression vector. Regulated expression and secretion of humanized F(ab')₂ antibody from this vector achieved using the promoter, signal peptide, and terminator from a rice alfa-amylase gene Amy3D. The recombinant humanized F(ab')₂ antibody was expressed from the transgenic rice cell culture on the sugar-free medium. Expression and secretion of assembled antibody was observed in transgenic rice suspension culture by Western blot analysis and ELISA assay. The hzAb expression equivalent to 10% of the total secreted proteins was achieved, and a purification step was developed that yielded functional hzAb with purity greater than 95%. Furthermore, we confirmed that hzAb produced from rice cell suspension culture has biodistribution properties in athymic mice bearing LS 174T human colon carcinoma xenografts. These data indicate that the hzAb derived from plant cell suspension culture may be a potential pharmaceutical for cancer therapy and diagnosis.