Comparison of expression systems for the production of human interferon-a2b.

ABSTRACT

The production of human interferon alpha2b (IFN-α2b) in two expression systems, tobacco (Nicotiana tabaccum) and Escherichia coli, was compared in various aspects such as safety, yield, quality of product and productivity. In the E. coli system, IFN-α2b was expressed under a pelB signal sequence and a T7lac promoter in a pET 26b(+) vector. The same gene was also cloned in expression plant vector (pCambia1304) between cauliflower mosaic virus promoter (CaMV35S) and poly A termination region (Nos) and expressed in transgenic tobacco plants. The expression of protein in both systems was confirmed by western immunoblotting and the quantity of the protein was determined by immunoassay. The amount of periplasmic expression in E. coli was 60 µg/L of culture, while the amount of nuclear expression in the plant was 4.46 µg/kg of fresh leaves. The result of this study demonstrated that IFN-α2b was successfully expressed in periplasm of bacterial and plant systems. The limitations on the production of IFN-α2b by both systems are addressed and discussed to form the basis for the selection of the appropriate expression platform.

Keyword: Expression platform; Interferon-a2b; Scherchia coli; Transgenic tobacco.