

Enhanced production of recombinant proteins from plant cells by the application of osmotic stress and protein stabilization.

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Transgenic plant cell suspensions offer several advantages for recombinant protein production. In this work human granulocyte-macrophage colony-stimulating factor (GM-CSF) was produced from transgenic *Nicotiana tabacum* cells. The application of osmotic stress with mannitol at a concentration of 90 g/l enhanced the maximum extracellular GM-CSF concentration from 76 ng/ml to 130 ng/ml (1.7-fold increase). The addition of bovine serum albumin (BSA) along with mannitol further increased the maximum extracellular GM-CSF concentration by 2.5-fold. GM-CSF degradation studies in the plant cell medium revealed that mannitol and BSA both stabilize GM-CSF. The addition of gelatin along with mannitol to the plant cell medium also enhanced the maximum extracellular GM-CSF concentration and stability over time.