

THE EXPRESSION OF ENGINEERED ANTIBODIES IN THE ROOT SYSTEM

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The use of the plant root exudates represent a viable strategy to overcome the costs and the technical difficulties in large-scale recovering of the exogenous proteins produced in plants. Rhizosecretion seems the best candidate protocol for a large scale production combining various positive aspects, like a simpler purification and the possible avoiding of gene silencing by product subtraction, with the use of growth conditions compatible with a sterile environment, like the requirements of the biopharmaceutical GMPs and the environmental protection.

In this work we used a specific root expression system to produce two engineered antibodies related to two severe human diseases (the breast cancer and the Alzheimer disease).

The heterologous genes, coding for the scFvs, were fused in frame to the sequence encoding barley β -glucuronidase signal peptide, which is responsible for the rhizosecretion and it is under the control of the root hair cell promoter LeExt1.1, to obtain a predominant expression in trichoblasts of crop plants.

The binary vectors (for stable and transient transformation), containing the above cassettes, were used to transform potato and tobacco plants by *Agrobacterium*. The resulting plants were grown in an aeroponic cultivation system.

A molecular analysis was performed to assess the presence of the exogenous proteins and their correct folding by functionality assays.