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Poster Abstract – A.02

MOLECULAR FARMING OF AN ENGINEERED ANTIBODY: PRODUCTION IN PLANT ROOT EXUDATES

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The costs and the technical difficulties in large-scale recovering of the exogenous proteins produced in plants still represent one of the bottlenecks of plant factory. Different strategies have been explorated to develop protocols fitting large scale production and biopharmaceutical GMPs. The use of the plant root exudates could represent a viable strategy, combining various positive aspects like a simpler purification, the possible avoiding of gene silencing by product subtraction, the use of growth conditions compatible with sterile environment and environmental protection. In this work we obtained transgenic Solanum tuberosum plants transformed by an engineered antibody inserted under the control of a strong, tissue-specific promoter.

The heterologous gene was fused in frame to the sequence encoding barley β-glucoronidase signal peptide, the translation product of which is responsible for the rhizosecretion, under the control of the root hair cell-specific promoter LeExt1.1, to obtain a predominant expression in trichoblasts of crop plants, and the octopine synthase terminator sequence is included. This cassette was inserted in the binary vector pBIN19.

Plants were tranformed and harvested in an aeroponic cultivation system. A molecular analysis was performed to assess the presence of the exogenous gene, by PCR on leaf DNA, and to demonstrate its expression, by RT-PCR on root and leaf tissue RNAs. We are evaluating the presence of the final protein in the root exudates and its correct folding by functionality assays.