

PA79 Transgenic plant production of Cyanovirin-N, an HIV microbicide

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ABSTRACT TEXT

Background:

A global microbicide implementation strategy requires economic large scale production. The protein microbicide Cyanovirin-N (CV-N) can be produced by recombinant E.coli, however it is unlikely that such fermentor based systems will supply global requirements. Transgenic plants benefit from economic and easy scale up and here CVN production by transgenic tobacco is explored as proof of concept.

Methodology:

Transgenic tobacco plants were generated, in which rCV-N was targeted to the plant secretory pathway. Western blot was used to detect CV-N in plant extracts and functionality tested by gp120 binding ELISA and in vitro anti-HIV assays. Plants were also generated in hydroponic culture to assess the feasibility of rhizosecretion for contained production.

Results:

Plant derived CV-N is functional and expressed at concentrations of at least 0.85% of the plant's total soluble protein. Small scale hydroponic culturing of transgenic plants demonstrated secretion of CV-N at 0.64µg/ml media after 30 days. Investigations into larger scale hydroponic systems are underway.

Conclusions:

Functional CV-N is expressed in plants at levels that may be suitable for commercial production. Rhizosecretion of CV-N by transgenic plants offers promising approaches to deal with regulatory issues. Plant expression strategies may represent an important step in the development of protein microbicides.

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