



TECHNOLOGY FOR RESEARCH COLLABORATION

Research at Northeastern involves producing valuable anti-tumor compounds, vinblastine and vincristine, through cell cultures of the plant *Catharanthus roseus*. The supply of these compounds, however, is limited by their availability in the plant. As a result of their low concentration in the plant, the market price for vinblastine and vincristine extracted from the plant source is estimated at \$1 million/kg and \$3.5 million/kg, respectively. The long-term goal of the research is to develop an economically viable process utilizing plant cell culture to meet the demands for important plant-derived pharmaceuticals.

Benefits for University-Industry Research Collaboration:

In order to develop an economically viable process, the project must increase productivity of the cultures as well as address issues associated with large-scale production. These anti-tumor compounds produced by *C. roseus* are already approved by the FDA and have been used for the treatment of childhood leukemia, Hodgkin's disease, and lymphomas for years. Industry collaboration is wanted to scale up the production of these plant compounds to make the system economically viable. Currently, there are a limited number of companies that support the use of plant cell culture for the production of important pharmaceuticals.

Research Area Details:

The investigator is studying the production of compounds known as indole alkaloids from a *C. roseus* using a cell line that has been transformed with *Agrobacterium tumefaciens*. This cell line is structurally differentiated and produces vindoline in suspensions. Vindoline and catharanthine can then be synthetically condensed in a few steps to yield vinblastine, the desired anti-tumor compound. To meet goals, the research involves understanding the "mechanism" by which various treatments affect and direct production and rationally apply and integrate these treatments towards an economically viable process.

The Bottom Line:

The long-term goal of the research is to develop an economically viable process using plant cell culture to meet the needs and demands for important plant-derived pharmaceuticals.

For More Information:

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