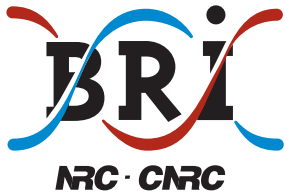


BIOPROCESS SECTOR

Biotechnology Research Institute

INFORMATION

www.irb-bri.cnrc-nrc.gc.ca



"Our technologies are used to produce preclinical materials and various research reagents needed for R&D projects, to test emerging bioprocesses under semi-industrial conditions, and to generate bioproducts to support sustainable development and the bioeconomy."

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MICROBIAL AND ENZYMATIC TECHNOLOGY

BRI's Microbial and Enzymatic Technology Group identifies, develops, optimizes and scales-up, whenever necessary, microbial or enzymatic processes for the production, purification and characterization of various products such as: biopharmaceuticals, enzymes, biopolymers, secondary metabolites and green products (bioproducts). The Group offers a one-stop approach to product/process development, from molecular biology to bioprocess scale-up and optimization. A portion of the Group's effort is also devoted to training highly qualified personnel in modern bioprocessing.

Our Research Activities

- ▶ Development of the methylotrophic bacterium *Methylobacterium extorquens* as a new prokaryotic expression system
- ▶ Development of industrially pertinent microbial strains employing bacteria (*E. coli*, *M. extorquens*) and yeasts (*P. pastoris*, *S. cerevisiae*)
- ▶ Use of various hydrolases in non-aqueous reactions, in condensation reactions, in combination with enzyme production, purification and characterization
- ▶ Optimization and scale-up of high cell-density fermentation processes employing the latest approaches in advanced process control as well as improved/new monitoring tools
- ▶ Development and optimization of bench-scale and pilot-scale purification processes.

Our Services

Our mission is to develop commercially attractive production bioprocesses that will succeed in the regulatory process and in the marketplace.

- ▶ Development of different recombinant bacterial and yeast strains to obtain various biologically active research reagents (receptors, bioinsecticides, enzymes, peptides, etc.)
- ▶ Scale-up of emerging microbial fermentation bioprocesses, up to the 1500 L scale, together with primary recovery under semi-industrial conditions. Some of these bioprocesses have been transferred successfully to larger scale GMP facilities

- ▶ Scale-up and optimization of advanced product capture methodologies to facilitate product purification and reduce overall production costs
- ▶ Selection and improvement of particular hydrolases, along with process optimization, in order to greatly increase volumetric yields
- ▶ Production of proteins with ultra-low endotoxin loads for *in vivo* trials

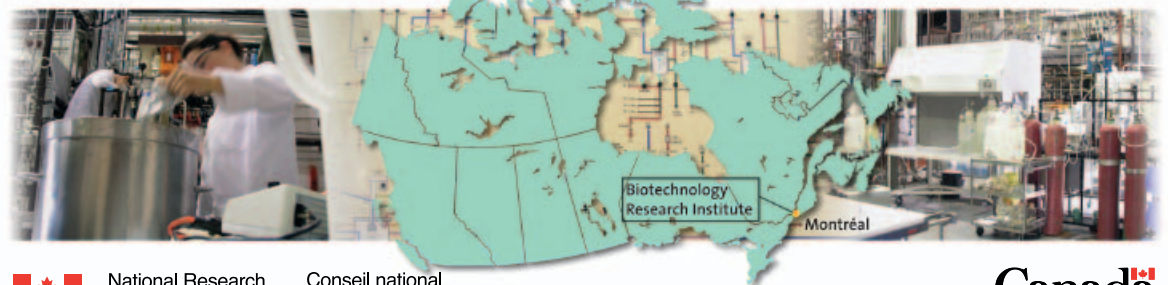
Research Examples

- ▶ Development of a first generation recombinant bioinsecticide for an industrial client
- ▶ Development of an improved methanol sensor for the *in situ* monitoring and control of methanol concentrations in fermentations. With modification, the same sensor could be used to monitor several other volatile compounds
- ▶ Successful expression of a recombinant, biologically active bacteriocin by *E. coli*, in collaboration with Université Laval
- ▶ Development of an industrial fermentation process for the production and purification of an antibody fragment
- ▶ Successful scale-up of a fermentation process, in collaboration with NPS Allelix
- ▶ Successful expression of two chitinase genes by *E. coli* and *M. extorquens*, in collaboration with a Canadian company
- ▶ Design of improved enzymatic bioprocesses for the production of added-value alkylated glycosides, with minimal production of side products. Utilization of products as biosurfactants or glycosides precursors used in biomedical research

Our Business Approach

Through service contracts and the licensing of our technologies, BRI's dynamic, flexible team supplies customized solutions for our partners' needs. In addition, BRI provides access to a number of advanced technologies and a wide variety of experts who regularly publish in leading scientific journals.

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