



Environmental Biotechnology Laboratory

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The Environmental Biotechnology Laboratory is a technological platform that enables the development and scaling up of industrial bioprocesses from residual materials or synthetic media. The industrial bioproducts can be enzymes, bioplastics, biopesticides, biofuels, solvents, surfactants, biocleansing agents, platform molecules, and many others.

ABOUT US

The Environmental Biotechnology Laboratory (LBE) is one of the large-scale laboratories of the Institut national de la recherche scientifique located in the INRS building in Québec Metro High Tech Park. It is open to users from both the public and the private sectors. LBE's clientele have access to scientific and technical support from the lab's specialized staff and can use the LBE's facilities for staff training as well as specific bioproduct research and development.

This facility enables its users to structure their development plans rigorously and invest their resources judiciously in the development and implementation of bioproduct plans. The scale of the bioprocesses and the components involved can be optimized, reducing investment risk when planning a full-scale plant. The bioproducts obtained will help generate customers' interest. Users will also be able to carry out the analyses required to achieve expected quality standards and obtain target market acceptance. They may even make their first sales.

All services provided by the LBE comply with the highest standards of confidentiality expected by its clients.

The LBE benefits from the expertise of the Canada Research Chair in Bioconversion of Wastewater and Sewage Sludge into High Value-added Products with respect to the development of bioprocesses and biological products. It draws on over 30 years of research and development expertise from its leading researchers.

SERVICES AND EQUIPMENT

All steps of the experimental conversion process can be carried out using modular units, including conditioning of the raw material, waste transformation, and recovery of the end product. The objective is to develop, optimize, and scale up new bioprocesses and recover, purify, and characterize the various products obtained from fermentation. Either waste (urban, industrial, and agricultural) or synthetic culture media can be used as substrate. Two hydrolyzers (of 150- and 2000-litre capacity) are used to prepare the substrates. The facility includes two instrumented fermentation laboratories, one reserved for waste and the other for synthetic media in order to avoid any contamination. Each fermentation laboratory has its own bioreactors (of 5-, 15-, 150-, and 2000-litre capacity).

The following modules are available for recovery of the end product from the fermented broth:

- Continuous centrifuge
- Microfiltration and ultrafiltration unit
- Protein separation system using chromatography and ion exchange
- Spray dryer to obtain powder or granules
- Freeze dryer

The facility also includes a class 100 controlled environmental chamber for inocula production, microbial strain storage, quality control, and characterization of purified microbial products. The facility is coupled with a complete analytical laboratory equipped with GC-MS, LCMS-MS, and a flow cytometer.



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