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Bioproducts and Enzymes from Environmental Metagenomes

Integrated GE³LS Research Framing New Bio-technologies to Aid Regulatory Decision-Making

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Summary

Our team has had success in the commercialization of a microbial consortium, called KB-1™, which is the only such consortium so far to gain approval through Environment Canada's New Substances Notification Regulations. Unfortunately, the development of KB-1™ is a rare example of a successful Canadian bioremediation project. Its development and approval required a decade-long effort, not only of genomics, microbiology and engineering, but also of discussion with government agencies. We will use our experience with KB-1™ as the basis for developing a framework for the integration of scientific research and public policy analysis. Barriers to the entry of new bioproducts to the marketplace often come down to a lack of familiarity by end users, governments and regulators.

Working with these groups, our aim is to lower barriers to entry by generating a comprehensive plan for introducing new bioproducts. We will integrate scientific, economic and policy data in studies that aim to provide comparisons of new technologies with old to help decision-making by regulators, industrial users, and policy makers. Much of this work will be carried out in collaboration with a new programme in Engineering and Public Policy at the University of Toronto, whose mandate is to promote studies at the intersection of public policy and technology so that sound policy judgments can be made on the basis of well-developed and quantitative science.

We will approach this study in the following ways. First, we will devise quantitative methods for assessing the environmental and resource impacts of new bioproducts compared to similar, petroleum-derived products. Second, we will use these methods to assess the relative merits of the new biological products and processes developed in this research project. Third, we will model how sustainable bioproducts industries can be maintained by providing quantitative information on environmental-resource impacts and total production costs.