



Biopharmaceutical Technology Roadmap

June 2, 2006

Sectoral Overview

Regional Data

Vancouver

Over 40 biotech companies, 3rd largest in Canada.

Over 70% of the cluster is focused on health research.

B.C. Cancer Research Centre, Genome B.C., Vancouver Hospital and Health Sciences Centre.

Saskatoon – Ag-biotech Cluster

- 17 agricultural biotech companies.
- Largest agricultural biotechnology industry in Canada, NRC Plant Biotechnology Institute.
- \$433M in biotechnology revenues in 1999, third overall in Canada, half from exports.

Montreal – Biopharma Cluster

- 63 health related biotech companies.
- Large multi-national pharma companies.
- NRC Biotechnology Research Institute, 3 university research centres.

Toronto – Bio-health

- Over 50 biotech companies.
- Leading research hospitals and institutes such as the Samuel Lunenfeld Research Institute, Ontario Centre for Gene Computing.
- Research in oncology, cardiovascular diseases, gene therapy, autoimmune diseases, tissue regeneration.



Snapshot of the Biotech Industry

Snapshot of the Canadian biotechnology sector

358 firms, of which 75% are SMEs

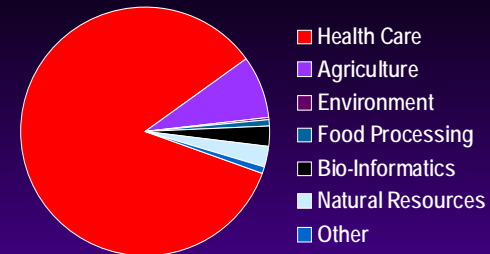
84% of the \$827M in R&D is done within the health sector

70% of the Canadian companies are in the health or agri-food sectors

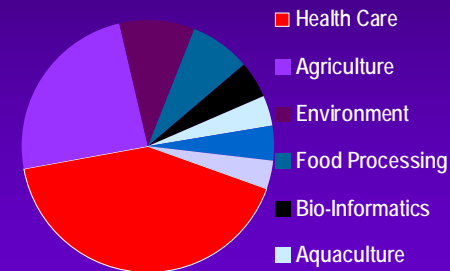
The health and agri-food sectors represent 89% of Canadian biotechnology revenues

\$1.9B in revenues and \$718M in exports

R&D by Sector (1999)



Number of Companies by Sector (1999)



Source: Statistics Canada 1999
Biotechnology Survey



What is an Industry Roadmap?

- Planning process driven by projected needs of tomorrow's markets
- Helps companies to identify, select and develop technology, research and products to capture that market
- Brings together a team to develop framework for organizing and presenting information in a roadmap
- Provides a way to leverage investments



Benefits of a Roadmap

- Consensus on key technologies
- Guidance for R&D investment
- Identification of new market opportunities
- New network and partnerships
- Reduced risk through collaboration
- Economic & social benefits to society and business
- Increase competitiveness, productivity and profitability



The Goals/ Objectives of the Roadmap

- To identify and optimize the future market and technology opportunities for the participants and the sector/
 - by identify the critical science, technology and research needed to capture market needs over the next 10-15 years
- To help guide industry, academia and governments to develop supporting strategies and action plans/
 - by planning for resource allocation
- To ensure future competitiveness of the industry/
 - by maximizing benefits from knowledge based innovation



The Challenges

- How can we reduce the risk of investment in research and development? (**sectoral parameters**)
- How do we align R&D investment with true market potential? (**lacked statistics; evergreening process**)
- Industry versus Technology Roadmap: challenges across technologies (**internal debate**)
- Barriers and Opportunities (**status of industry in Canada**)



Progress

- Established the Steering Committee, consulted with members from industry, academia and government research institutions
- Identified some key needs
 - Developed a vision & mission statement
 - Definitions of biopharmaceuticals
 - Description of a successful sector
 - Future needs
 - Competitiveness analysis
 - Barriers, strengths, weaknesses



Progress cont'd

2 Focus Days

Stakeholders discussed issues:

1. New market opportunities and critical technologies
2. Strengths and weakness of Canadian biopharma companies
3. Major barriers to future development
4. Possible solutions to the barriers



Progress cont'd

Focus Day Findings: Canada's strengths

- Excellent people and research institutes
- Ranked technologies in order of perceived strengths: genomics, proteomics, bioinformatics, metabolomics, pharmacogenomics, in silico biology, nanotechnology, stem cells, photodynamic technologies,
- Clinical trials



Progress cont'd

Focus Day Findings:

Canada's weakness - commercialization

- lack of financing
- the regulatory system
- intellectual property and patent issues
- a shortage of capable and experienced management
- small Canadian market size



Recommendations

- **Research spin-off companies should be enabled to build up to their management teams, intellectual property positions and proofs of concept before advancing to private markets.**
- **University industry liaison offices should be encouraged to devote resources to readying companies for approaching capital markets.**
- **Despite some positive changes in the immigration rules, a great deal needs to be done both in immigration and taxation if Canada is to succeed in attracting supremely capable international managers here to pilot Canadian companies.**