



**Presentation to the
Ontario Competitiveness & Prosperity
Forum**

Pharmaceutical/Biotechnology Cluster in Mississauga

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October 21, 2002

OBJECTIVES

1. Pharmaceutical Industry Environment
2. Harnessing the Industry's Potential
3. Pharmaceutical Industry Investment Benefits



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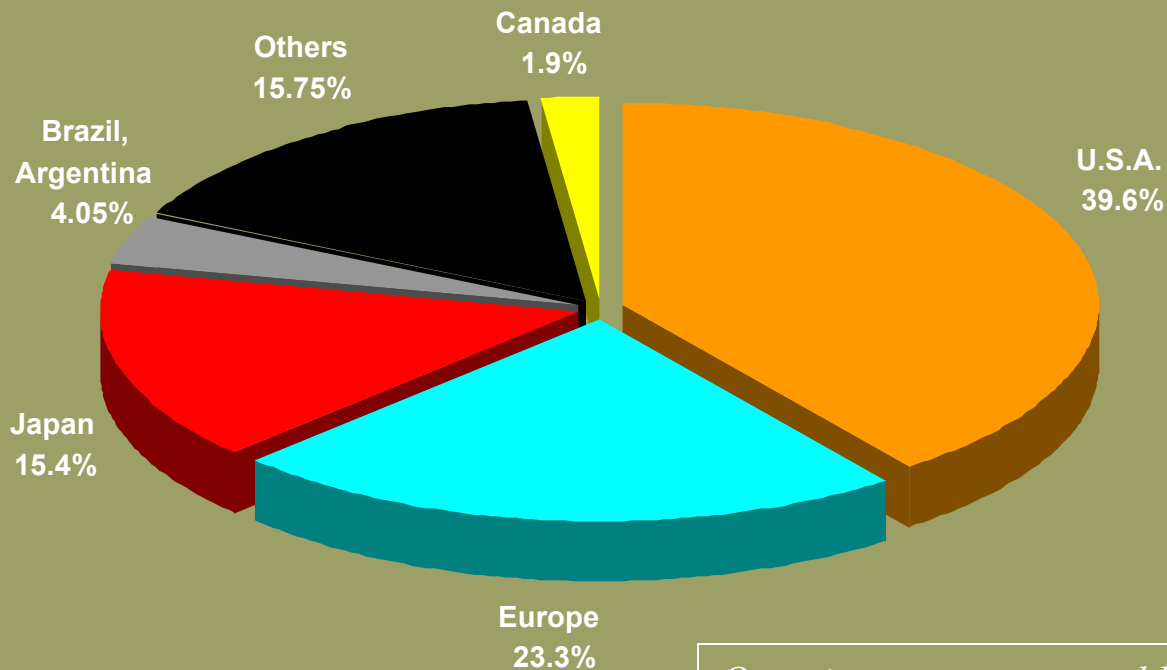
Pharmaceutical Industry Environment

The Innovative Pharmaceutical Industry

- Innovative, or 'brand name', pharmaceutical industry refers to companies actively engaged in the pursuit of new medical discoveries
 - significant R&D costs
 - strong reliance on patent law, enforcement
 - heavy reliance on scientific investments and partnership
 - individual companies focus on specific therapeutic areas
 - compete for leadership in new areas of medical care or for better outcomes in a therapeutic area

Global Market

WORLD PHARMACEUTICAL MARKET (1998) - US\$251 BILLION



Ontario represents roughly 40% of the Canadian market, or 3/4% globally

* Excludes OTC and Vaccines

Source: The Pharmaceutical Market World Review 1999, IMS Health

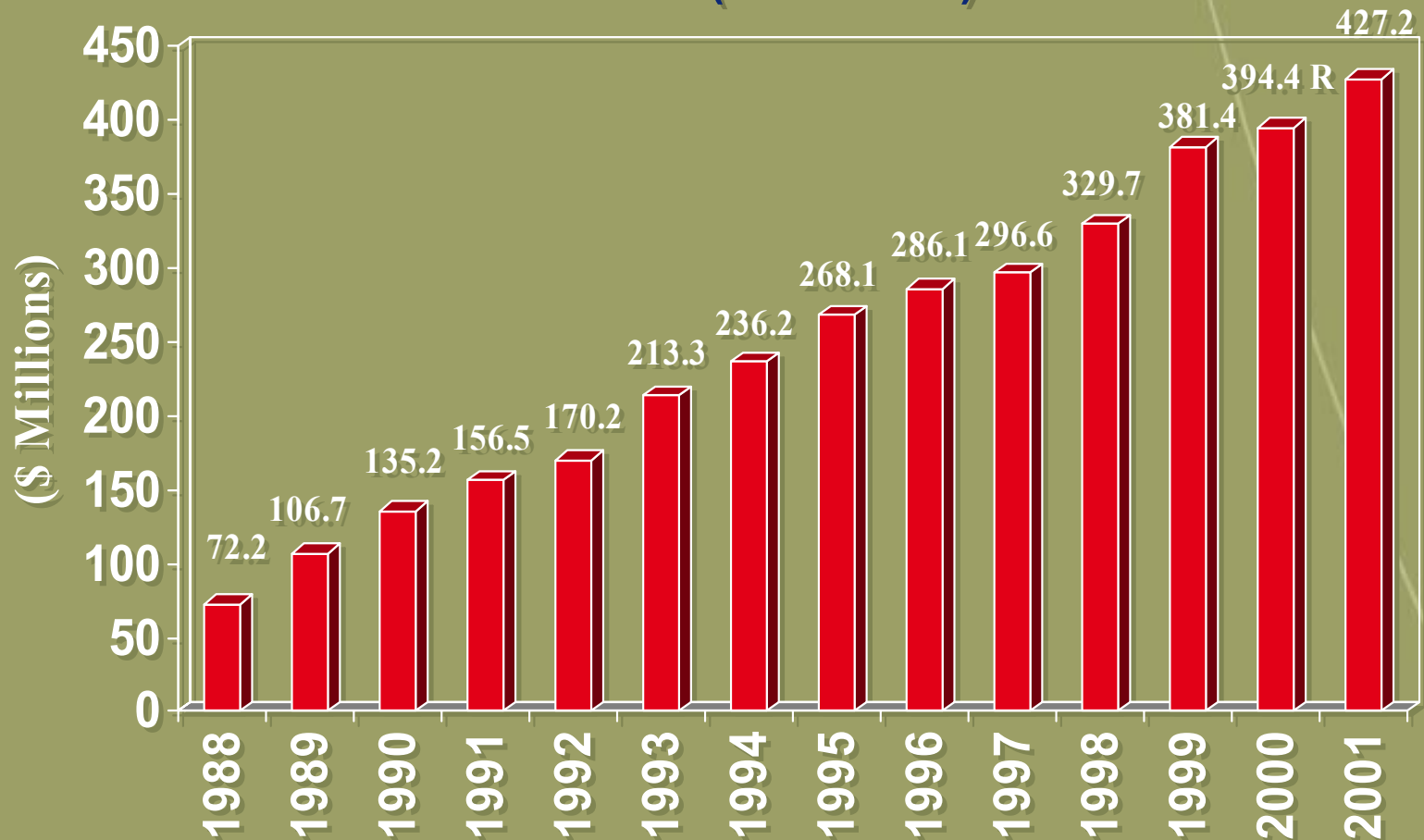
Canadian R&D Investment 2001

- Pharmaceuticals/biotech sector ranked 2nd in R&D Intensity (R&D as a % of Revenue)
- 25 of the top 100 R&D companies were from pharmaceuticals/biotech sector
- GSK ranked No. 3 in the (innovative) pharmaceutical (R&D) sector

Sector	R&D Exp. (2001)	Research Intensity (R&D as a % of Revenue)
1. Telecommunications	\$6.4B	17.3%
2. Pharma/biotech	\$1.27	14.1%
3. Software/computers	\$955M	9.7%
4. Aerospace	\$686M	~6%
5. Energy	\$410.5	~5%

Source: Canada's Innovation Leaders. Research Infosource Inc.; July 2002

Pharmaceutical R&D* Investment Ontario (1988-2001)



Source: PMPRB Annual Reports

•Does not include capital equipment and depreciation expenditures

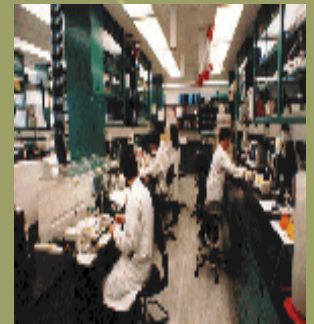
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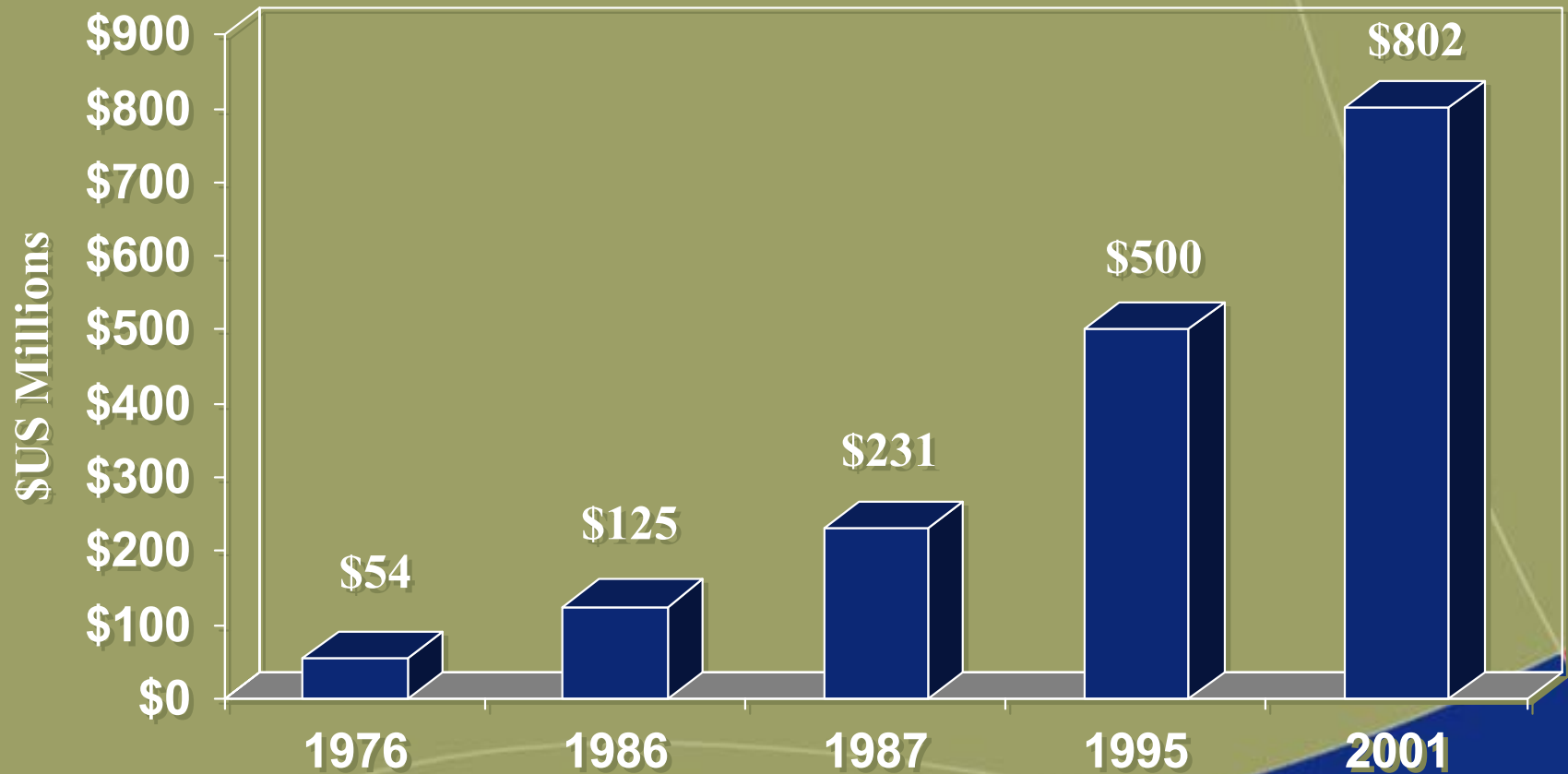
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Research and Development at GSK

- Over \$100 million invested annually in Cdn. R&D
- Employ 400 highly skilled R&D staff - one of the largest R&D organizations in the country
- Conduct over 200 clinical studies annually in Canada, involving some 40,000 patients
- Approximately 35% of our national clinical research program is conducted in Ontario
- Extensive university/biotech discovery collaborations



The Estimated Cost of Bringing a New Drug to Market (1976-2001)



Source: University of Rochester, Texas A&M University, Tufts University, Tufts Center for the Study of Drug Development 2001, US Congress Office of Technology Assessment.

New Drug Development Process

- Preclinical Development
- Clinical Development
- Regulatory Approval
- Effective Patent Term



Patent
Year 0

3 - 4

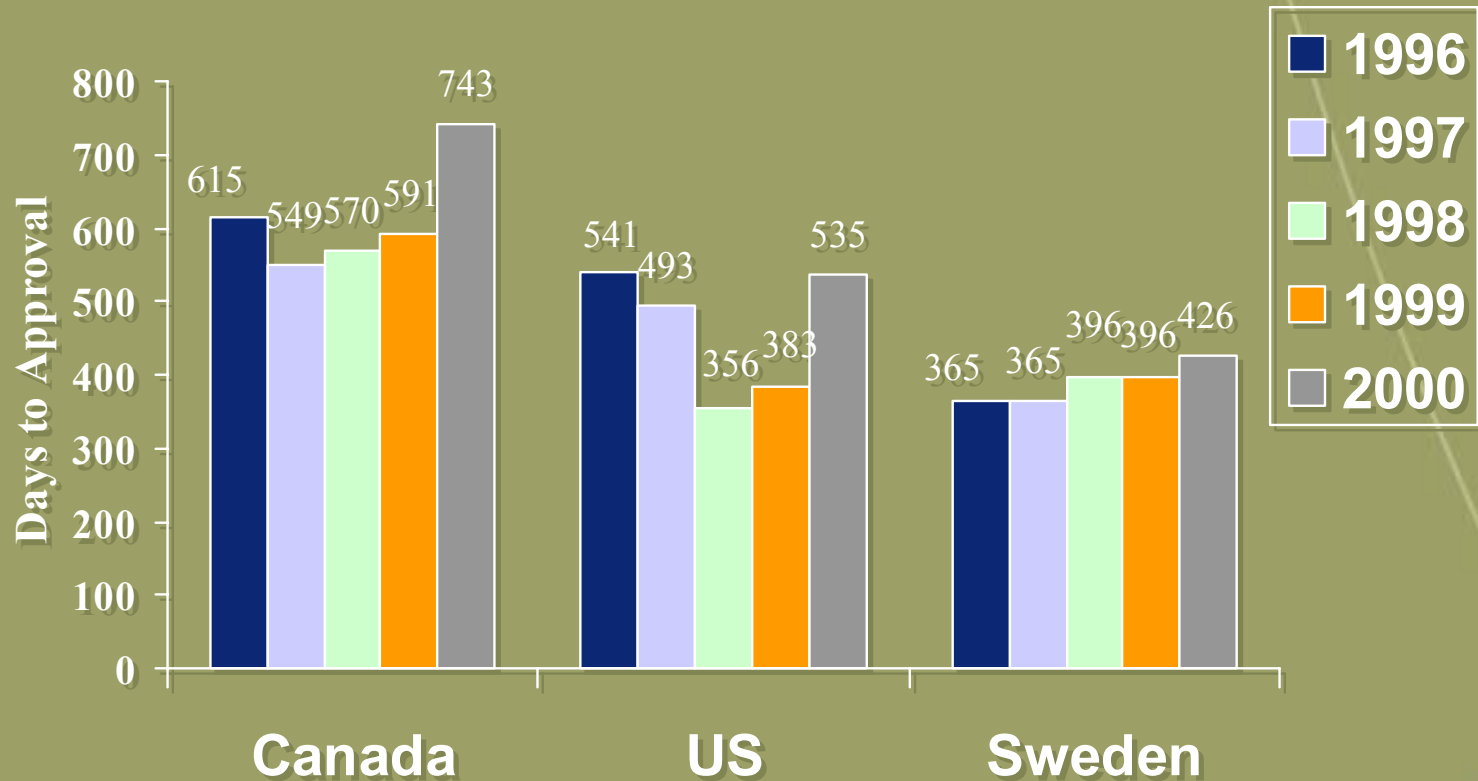
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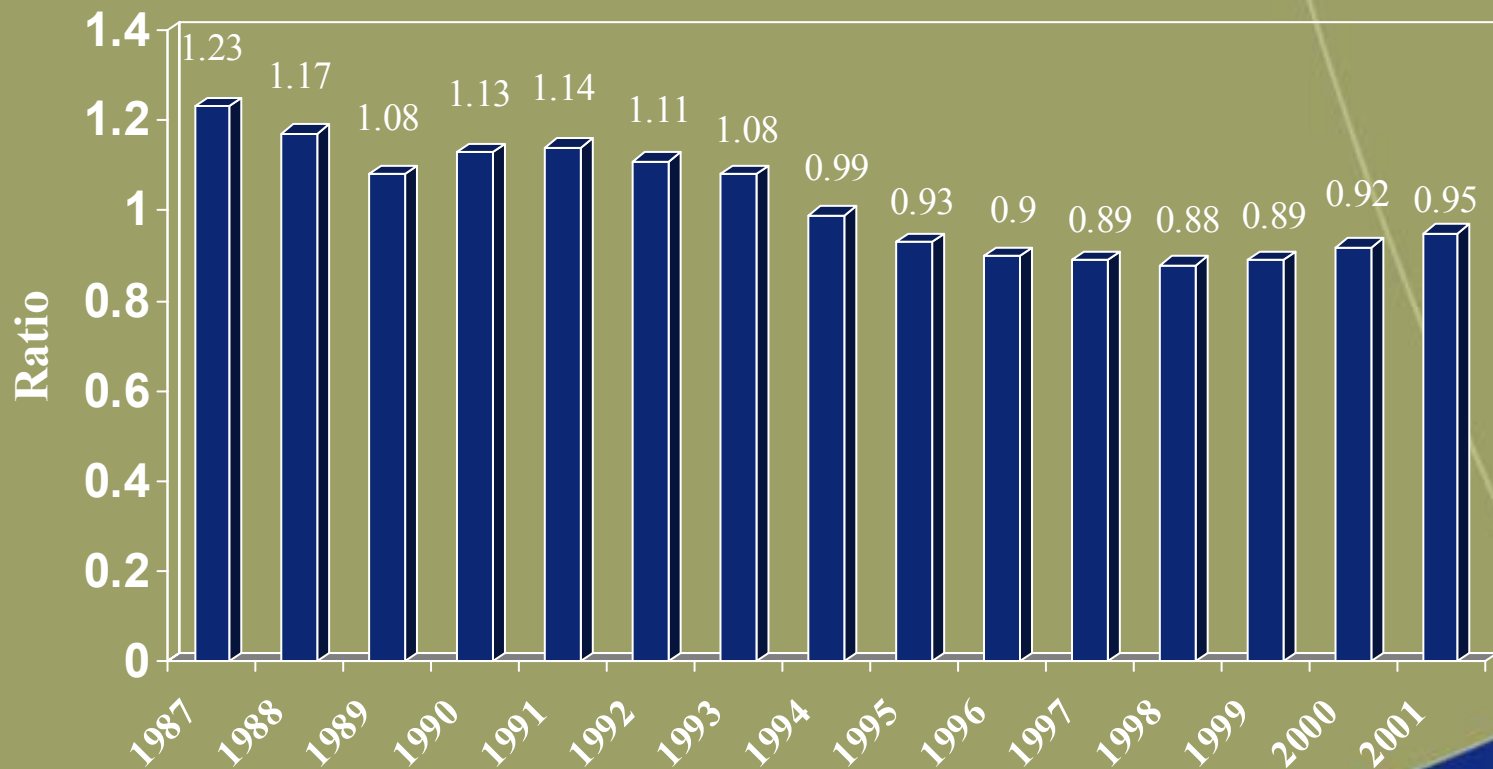
* Average year for market entry, individual products can vary

International NCE Approval Times



Source: Rx&D, PhRMA, SAPI.

Ratio of Canadian Prices to Median International Prices (1987-2001)



Source: PMPRB Annual Report, 2001

Note: Beginning in the year 1999, the ratio includes prices of patented drugs for human use only



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Harnessing the Industry's Potential

Industry Investment

✉ *“Innovation is the now recognized as the major, if not the sole, sustainable source of economic growth and the major determinant of the wealth of a nation.”*

Conference Board of Canada, Performance and Potential, 1998

Investment Potential in Ontario

- To sustain and enhance innovation by becoming one of the top five jurisdictions in North America
- Magnitude of opportunity: US\$60 billion per year
- Over \$13 billion total investment over next decade (by 2005 a potential level of \$1 billion per year investment in Ontario)
- Represents 7,000 direct jobs plus 18,000 indirect jobs = 25,000 new jobs (by 2006)

Recommendations of Paper

- Partnership between Industry and Government:
 - Level regulatory playing field
 - Leverage Ontario strengths to increase Industry investment

Pharmaceutical Industry Investment Benefits

Current GSK Investments

- GSK has established the \$10M *Pathfinders Fund for Leaders in Canadian Health Sciences Research*
 - Objective: establish Research Chairs in every medical school across Canada, e.g.,
 - U. Toronto (HSC endowed chair in functional genomics)
 - McMaster U./Firestone Clinic (chair in pediatric respiratory)
 - U. Ottawa (5 year professorship in diseases of aging)
- GSK's commitment to working with UTM
 - helped develop the Master of Biotechnology Program with a donation of \$700K to student laboratory facilities and ongoing curriculum planning
 - GSK has employed 4 M.Biotech students during their internship periods

Investment Opportunities for Tomorrow

- Biosciences & Biotechnology Cluster at University of Toronto:
 - Current Opportunities:
 - MARS Discovery District
 - Toronto Academic Health Sciences Complex and CCBR
 - Future Opportunity:
 - Biotechnology Convergence Centre (BIOTECC) at UTM:
 - leverage the expertise and resources of the biopharmaceutical business environment in proximity to UTM
 - aligned with economic development targets for the City of Mississauga
 - expands the scope and reach of the University of Toronto beyond the city core
 - expands the academic program scope at UTM to train Canadian-based scientists and innovators of tomorrow