

Bio-Medical Sector & Initiatives

Toronto

January, 2010

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.....An Industry On The Move



Economic Development Division



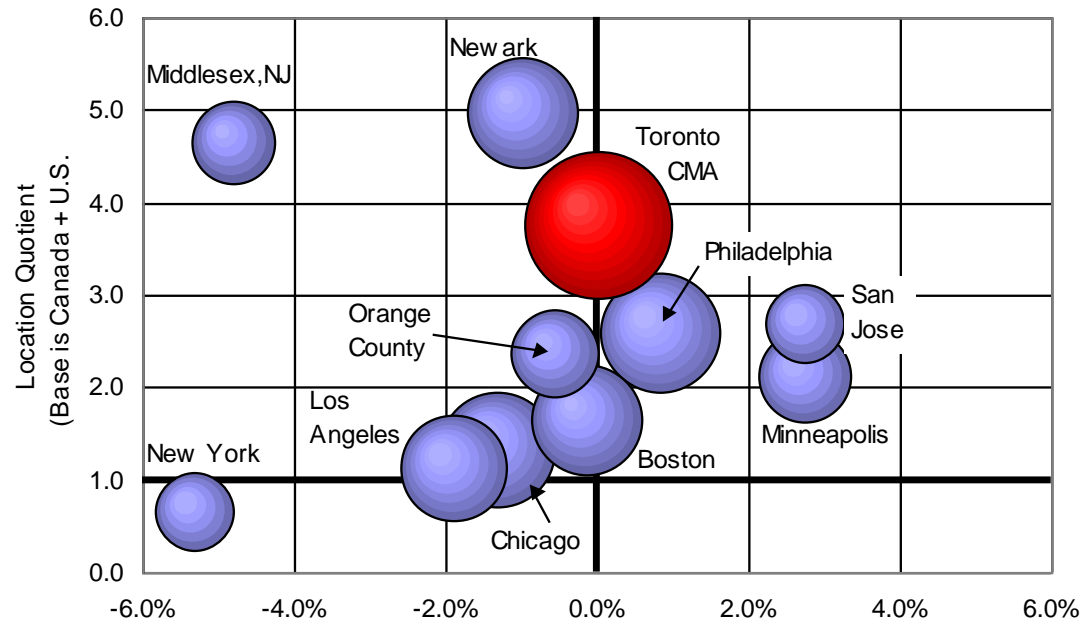
Toronto's Bio-Medical Cluster

- Largest Combined Bio-medical & Biotechnology cluster in North America
- Biotechnology Sector
 - Ranked 4th in North America-Within Top 10 in the world
 - Annual Revenues in excess of \$4 billion
- Provides jobs for more than 140,000 people
- Growth has been rapid and dramatic, measuring 25% in 2002 alone.



Biomedical & Biotechnology Cluster

**Biomedical & Biotech Cluster Growth-Share Matrix:
Toronto CMA and Large North American Clusters**



Average Annual Employment Change, 1988-98, Relative to Canada + U.S. Total

Source: Statistics Canada, City of Toronto Employment Survey, US Dept. Commerce/RFA

Industry Segments

- Medical Research
- Medical Devices & New Technology
- Pharmaceutical Products
- Medical Bio-Technology



Toronto: Canada's Medical Research Centre

- 100 hospitals and research institutions
- 9 Teaching Hospitals
- University of Toronto - Faculty of Medicine
- Ranked #4 in North America
 - > \$ 1.0 billion invested annually in medical research





Toronto's Research Specialization

- Cancer
- Bio-Materials
- Bio-Informatics
- Central Nervous System Disorders
- Genomics
- Proteomics
- Stem Cells



Toronto's Research Specialization

- Cardiovascular Diseases
- Respiratory Diseases
- Women's Health
- Bio-Photonics
- Trauma
- Muscular Skeletal
- Gastro-intestinal

Medical Devices Industry

- > 580 Medical Companies
- > 270 Business Service companies
- 80,000 employed in biomedical sector



Medical Devices

» Canada's Medical Device Market

- ✓ 7th largest in the world
- Ontario – Canada's largest producer
- ✓ > \$ 2 billion annually – 54%
- Ontario exports 90% of all Canadian Medical Devices



Pharmaceutical Industry

- Canadian Industry - \$15 billion
- Ontario - \$ 8 billion
- Employment
 - Canada - 17,000 jobs
 - Ontario - 11,000 jobs



Pharmaceutical Industry

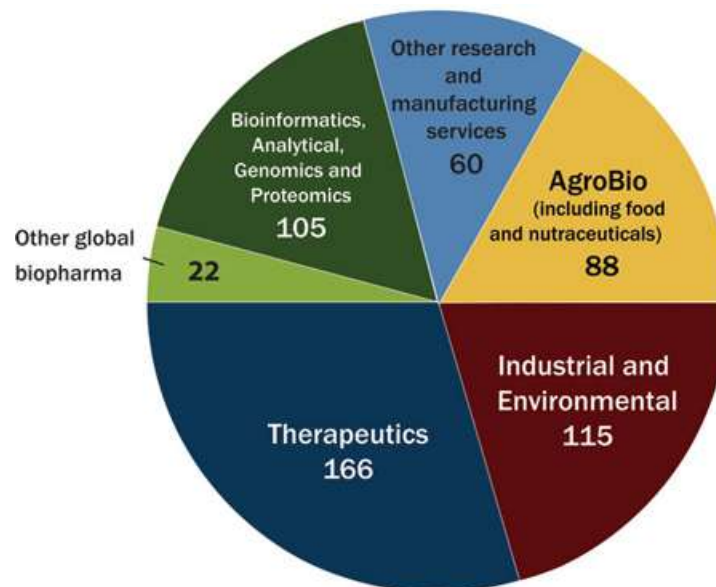
- Ontario
 - 39 Brand Name Companies
 - 10 Generic Manufacturers
 - 48 OTC Companies
 - Research & Development – 2009
 - Canada - \$1,219 million
 - Ontario - \$568.5 million – 46.6%
- # 1 in Canada



Biotechnology

- Canada - Ranked #2 in World

– 556 biotech development companies



Biotechnology

- Biotechnology Community
 - Includes Biotech Suppliers and Engineering Providers
 - Medical Technology Companies
 - Public/Nonprofit Sector
- - Employees > 14,000
- - Revenues > \$4 billion, annually
- - R&D - \$2 billion
- - Growth – 15 - 20%



Biotechnology

- Ontario – Largest Cluster in Canada
 - 23 % of companies (130 companies)
 - 33% of employment (> 3.500 employees)
 - 36% of biotech revenues
 - 42% of biotech R&D
 - 43% of biotech exports
- Toronto – 85% of Ontario biotech



Biotechnology Focus

- Vaccines
- Diagnostics
- Bio-Pharmaceuticals
- Biotech instrumentation
- Bio-Informatics
- Stem Cells
- Genomics and Proteomics





Bio-Medical Sector Initiatives

- Advice/Educational:
 - Bio Finance Conference
- Business Networks:
 - Life Science Ontario (LSO)
 - The Biotechnology Initiative (TBI)
- Marketing/Promotion:
 - BIO 1989 - 2010
 - Hosted BIO : 1989, 1994 & 2002
 - BioSource Directory
 - Toronto's Discovery District

Bio-Medical Sector Initiatives

New Capital Projects:

- MARS/Toronto Biotechnology Commercialization Centre
- Centre for Cellular & Bio-molecular Research (CCBR)
- Faculty of Pharmacy

Total: > \$ 600 million



New Developments

- MaRS Phase 2
925,000 sq ft facility devoted to the commercialization and convergence of innovative new technologies



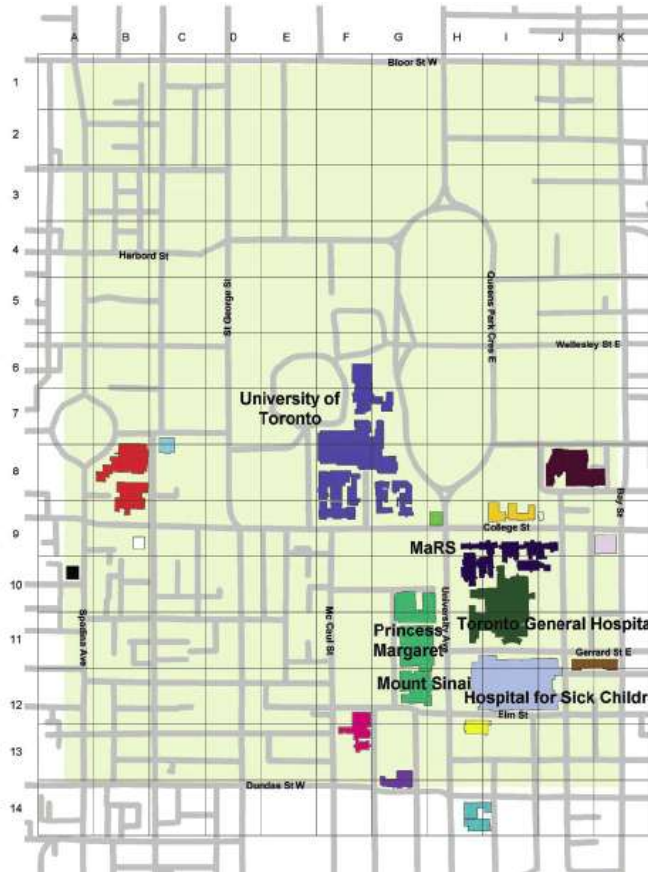
New Developments

- Centre for Addiction and Mental Health (CAMH)

Development of a \$ 250 million campus for research and development and the application of new treatments for central nervous system disorders.



Toronto Discovery District



Research Institutes:

- Advanced Biotechnology Centre: F12
- Advanced Medical Discovery Institute: G11
- Advanced Optical Microscopy Unit: B11
- Advanced Protein Technology Centre: F12
- Analytical Nanotechnology Technology Centre: G11
- Applied Molecular Oncology: G11
- Artificial & Autonomous Research Centre Foundation: F10
- Aviatrix Biotech: SE
- Biology and East Department of Medical Research: F9
- Biology and West Division Center: F10
- Baycrest Centre for Geriatric Care: NW
- Cell Pharmacy: G11
- Canadian MacMillan Children's Centre: NE
- Campbell Family Institute for Breast Cancer Research: G11
- Canada Mouse Mutant Repository: F10
- Canadian Airports Network: F10
- Centre for Addiction and Mental Health: SE
- Centre for Applied Genomics (TCAG): F10
- Centre for Computational Biology: F10
- Centre for Genomic Medicine: K12
- Centre for Global Health Innovation: F10
- Centre for Modeling Human Disease Gene Trap: G11
- Centre for Molecular Human Disease Management & Prevention: G11
- Centre for Nanobiotechnology and Experimental Fusion: G11
- Centre for Research and Health Care Engineering: F9
- Centre for Research in Neurodegenerative Diseases: F10
- Centre for Space and Chronobiology: G1 NW
- Centre for Stem Cells and Tissue Engineering: G11
- Centre for Systems Biology: G11
- Clinical Research Unit: F10
- Department of Medical Genetics and Microbiology: F10
- Department of Microbiology: G11
- EMA Sequencing Facility: G11
- Dr. Zina Cohen Digestive Diseases Clinical Research Centre: G11
- Toronto Northern Family Foundation Research Clinic (Multiple Sclerosis): G10
- McGill Centre for Cell Proliferation: F10
- Immunology Centre: G11
- Reproductive Cancer Research Unit: K9
- Flow Cytometry Facility (FCF): F10
- Frederick A. Lawton Centre for Cellular Genetics: G12
- Neurotoxicology Research Centre: K9
- Researcher Work Station: G12
- Researcher Work Station for Research Institute: G12
- QAMT - Intelligent Energy for Adaptation, Participation and Technology: G12
- Institute for Life Course and Aging: G9
- Laboratory for Applied Biophysics: G11
- Leslie L. Day Pharmacy Building: F10
- Maria Mitchell Stroke Centre: G10
- McLaughlin Centre for Molecular Medicine: F9
- McMaster Institute for Applied Health Sciences: F10
- Microarray Centre: G11
- Molecular Diagnostic Informatics Technology Centre (MDIT): G12
- Mount Sinai Hospital: G11
- Mount Sinai Centre: G9
- Mount Sinai Imaging Centre: F12
- Mount Sinai Imaging Technology (MSIT) Core: G9
- NIHR Bioreactor: G11
- Ontario Molecular Weight Imaging: G11
- Ontario Cancer Biomarker Network (OCBM): F9
- Ontario Cancer Institute: G11
- Ontario Centre for Genomic Computing: F10
- Ontario Centre for Structural Proteomics: G11
- Ontario Genomics Institute: F10
- Ontario Institute for Cancer Research: F9
- Schizophrenia & Autism Institute: NE
- Postdoctoral Fellowship Medicine Program: F10
- PEI Centre: G9
- Philip S. Thomas Cell Therapy Facility: G10
- Protein Expression Technology Centre (PE-TEC): G9
- Princess Margaret Hospital: G11
- Proteinology: F10
- Proteinomics Centre for Health Research: G11
- Proteinomics and Mass Spectrometry Centre: F9
- Proteinomics Research Centre: F9
- Quality of Life Research Unit: G12
- Radiation Modulated Centre for Artificial & Autonomous Disease: G11
- Research Centre for Women's and Infants' Health: G11
- Rubicon University: SE
- Samuel Lunenfeld Research Institute Microarray Facility: G11
- Shanghai-Toronto Institute for Health Research: G11

- Shel-McLaughlin Centre for Pollution Care: G11
- St. Michael's & Women's College Research Institute: J9
- St. Michael's Hospital: SE
- Structural Genomics Consortium: F9
- TCP Facility Operations: F10
- TCF Research Operations: F10
- Toronto Centre for Protein Care: G11
- Toronto Children's Centre for Cell and Biomolecular Research: G10
- TORONTO Centre for Imaging Cellular Processes: F10
- TORONTO Light Microscopy Unit: F10
- Toronto Culture Media Facility: G11
- Toronto Centre for Proteogenomics: F10
- Toronto General Hospital: F10
- Toronto General Research Institute: F10
- Toronto Health Institute: G12
- Transgenic Core & Specialty Resources: F10
- University Health Network: F10
- University of Toronto: F9
- UoT Centre for the Study of Post-12: J9
- UoT Institute of Biomedical & Biomedical Engineering: F9
- UoT Joint Centre for Bioetics: J9
- Women's College Hospital: J9
- York University: SE

Biotechnology Companies:

- Adept Biosciences Inc.: F9
- Aerovox Inc.: F9
- Aerata Biosciences Inc.: F11
- Cellular Biosystems Inc.: F9
- Centra International Inc.: F9
- Chemix Gene Ltd.: NE
- Carbon Chemical Laboratories Inc.: NW
- ExoSpec Systems Inc.: F9
- Evans Biotechnology Corp.: J10
- Genetics Biotechnology Corp.: SE
- Hypoxagon Diagnostics Inc.: F12
- ICL Bio Sciences Corp.: SE
- In Vivo Strata Biotechnology Inc.: F9
- Novartis Chemical Technologies: F9
- Ray Molecular Corp.: NW
- Latent Proteomics Inc.: F9
- Lumina Molecular Diagnostics: F10
- Molecular Templates Inc.: F9
- Neobion Inc.: F9
- Northern Biotechnology Inc.: J11
- Northern Diagnostics Inc.: SE
- NP2 Pharmaceuticals Inc.: F9
- Phyrene Research: F9
- Phyrene Therapeutics Inc.: F9
- Simon Therapeutics Inc.: G9
- TM Bioscience Corp.: F10
- Translational Therapeutics: F9
- ZIVA Corp.: NW

Biomedical Companies:

- Advanced Chemistry Development Inc.: SE
- AGS Biomedical America South: F9
- Allegro Technologies Inc.: F9
- Clinical Diagnostics Technologies: F9
- Diagnostic Systems Laboratories: F9
- Pathways International Inc.: SE
- Santara Optics Medical Laboratories: F10
- Seneca Life Sciences Corp.: F10
- Interfacis Biotech: F9
- IBLIS-Genex Ltd.: NW
- Optimix Technologies Inc.: NW
- Proctor-Dinkins: NW
- Seneca Life Sciences Ltd.: SE
- Verona Clinical Research Corp.: NW

Pharmaceutical Companies:

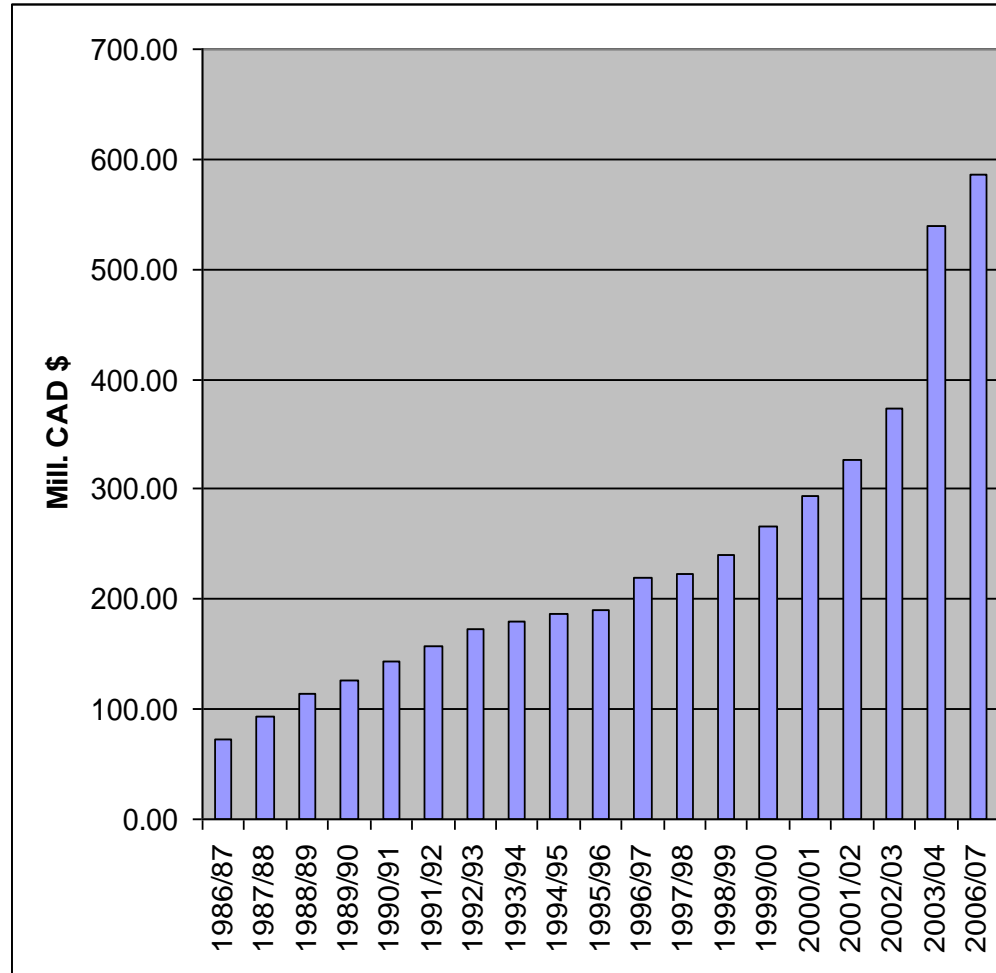
- AMP Therapeutics Inc.: F9
- ApPharm Inc.: F9
- Arcobioscience Canada Inc.: F9
- Cascade Therapeutics Inc.: F9
- Chemix Inc.: F9
- Chemix Biotech Inc.: F9
- Highland Therapeutics Inc.: F9
- Johnson Laboratories: NE
- Mariposa Corp.: G9
- Merck Frosst Canada Ltd.: F9

The Discovery District

- The Discovery District is a downtown research park with 7 million sq. ft. of facilities
- Canada's largest concentration of research institutes, business incubators and business support services.



Medical Research- Public Funding has Increased to >\$2 million per day



The MARS Project

MARS is a non-profit corporation with a mandate to promote the growth of small technology companies and the successful commercialization of academic research by bringing together scientists, business and support services in a commercial cluster



MARS Complex Full Build Out





Business Opportunities in Toronto

- Research - Major R&D Tax credits
- Cooperative partnerships
- Clinical Trials
- Technology Licensing Opportunities
- Strategic Alliances
- Joint Ventures

A Bio-Medical Industry

.....On The Move

