

Bio and Health Industries Profile^[1] - Minneapolis - United States

1. Sector Overview

The geographic area served by the Minneapolis Consulate includes the states of Minnesota, North and South Dakota, Iowa and Nebraska . Containing 50% of the region's total population, Minnesota is the most densely populated. The Minneapolis/St. Paul metropolitan area, with a population of nearly 3 million, ranks as the fifteenth largest metropolitan area in the United States.

Minnesota is traditionally known for four industries that together make up the foundation of its Life Sciences/Biotechnology sector: **Health Services, Medical Devices, Agriculture and Information Technology**. It is the convergence of these industries that the state is counting on to boost its global leadership role. The new model for economic success assumes a convergence of *multiple* technologies to create entirely new markets. Traditional markets like manufacturing, advanced materials, communications, medical and information technology are meshing with biology, genomics, food/agriculture and other fields to drive new economic engines. In 2003, revenues of the Minnesota companies involved in Life Sciences were reported in excess of USD \$16 billion² . Industry employment in these sectors has been estimated to exceed 65,000.

Outside of Minnesota, other regions covered by the Consulate General are experiencing a similar convergence including Des Moines-Cedar Rapids-Iowa City, Omaha-Lincoln-Council Bluffs, and Fargo-Grand Forks-Moorhead.

Amidst a diversified and stable economy, Minnesota hosts 19 Fortune 500 companies and 5 of the Forbes' 200 Best Small Companies. Prominent companies active in the Life Science sector include:

- **3M** (<http://www.mmm.com>) - A multi-billion dollar Fortune 500 company which develops and produces, medical technology products, pharmaceuticals and bio-based materials. 3M is one of the most diversified companies in the world.
- **Boston Scientific** (<http://www.bostonscientific.com>) - Minnesota is home to the cardiac division of Boston Scientific (headquartered in Boston, MA). This is a major operation with R&D, as well as manufacturing of cardiac stents, catheters and guidewires.
- **Cargill** (<http://www.cargill.com>) - With interests in a wide variety of life sciences markets Cargill develops and provides agricultural and food products throughout the world. Cargill is ranked #1 of Forbes 400 private firms.
- **Cargill Dow** (<http://www.cargilldow.com>) - A partnership between two of the world's largest companies - Cargill and Dow Chemical - Cargill Dow is often referred to as "the Green Microsoft." Cargill Dow develops and manufactures innovative bio-based materials, such as plastics made of corn - to replace petroleum-based products.
- **Cenex Harvest States** (<http://www.cenexharveststates.com>) - A diversified Fortune 500 company that provides food, grain and energy products worldwide. CHS manufactures soy products including edible refined oil, ink, flour, soy meal, fatty acids and lecithin.
- **Ecolab** (<http://www.ecolab.com>) - A world leader in premium commercial cleaning and sanitizing products and services. They have a commitment to using environmentally friendly - often bio-based - materials.
- **General Mills** (<http://www.generalmills.com>) - An internationally recognized leader in food and nutrition products.

- **Guidant** (<http://www.guidant.com>) - Guidant (based in Indianapolis, IN) has a major R&D and manufacturing facility in Minnesota . This is the home to their Cardiac Rhythm Management division and their new Institute for Therapy Advancement.
- **H.B. Fuller** (<http://www.hbfuller.com>) - A world leader in the manufacture of adhesives, coatings and sealants.
- **Hormel** (<http://www.hormel.com>) - An international manufacturer of meat and other food products. They approach the life sciences industry as both buyers and suppliers.
- **Land O'Lakes** (<http://www.landolakesinc.com>) - A major producer of food and animal feed ingredients also genetically engineered seeds for improved crop performance.
- **Mayo Clinic** (<http://www.mayoclinic.org>) - One of the world's top hospitals, Mayo Clinic is a major research organization and is considered an expert in many areas of human health.
- **Medtronic** (<http://www.medtronic.com>) - World leader in the design and manufacture of medical devices such as cardiac pacemakers, defibrillators, stents, and neurological and spinal implants.
- **St. Jude Medical** (<http://www.sjm.com>) - An international leader in the design and manufacture of medical devices, primarily in the cardiac field.
- **Syngenta** (<http://www.syngenta.com>) - Syngenta (based in Switzerland) is a world-leading agribusiness that is committed to sustainable agriculture through research and technology. A leader in crop protection, they rank #3 in the world market for high-value commercial seeds.
- **United HealthCare** (<http://www.unitedhealthcare.com>) - A Fortune 100 company, and a highly respected Minnesota-based health maintenance organization (HMO).

2. Market and Sector Challenges (Strengths and Weaknesses)

In 2003 the Governor of Minnesota announced that the state would set a goal of becoming a world leader in the bioscience industry. This effort is meant to take Minnesota beyond its already excellent reputation for medical devices. A bioscience summit and resulting council comprising government, business and academic leaders are pursuing a strategy that emphasizes ways to combine technologies and materials. Device manufacturers, for example realize that in order to maintain market share and long term survival, they must incorporate the use of biologics in combination with their products. Examples of this push for synergy include the drug-coated stent being developed in Minnesota by Boston Scientific, Medtronic and Guidant and the coating process developed by Surmodics and used by Johnson & Johnson. Other examples are emerging as the industry evolves and Minnesota's scientists and industry leaders push to the front edge of this revolution.

The Governor's 25 member Bioscience Council is a key player in sector developments, looking at newer technologies, commercialization opportunities and the challenges facing companies and research bodies. It looks to stimulate a cross-disciplinary approach to life sciences and also serves to inform legislators and advise the Governor on funding matters in the sector.

Of all the many opportunities recognized by these and other constituents, one decided weakness is a lack of local biotechnology-focused venture capital. There is no shortage of venture capital for the medical device and high technology industries, but biotechnology *per se* is considered a rather new industry in Minnesota . One major factor affecting this is the lack of biotechnology expertise in corporate management. Thus, the Governor's Bioscience Council is looking for ways to attract both seasoned biotechnology CEOs and venture capitalists to this region.

3. Sub-Sector Identification

Minnesota is renowned for its expertise in medical device manufacturing, ranking consistently as the #1 or #2 clusters in the nation. It is particularly rich with manufacturers of cardiac devices,

with market leaders such as Medtronic, St. Jude Medical and Boston Scientific/ (Guidant) all manufacturing their cardiac care products in the Twin Cities. In addition to driving the cardiology research that has spawned so many exceptional companies, the University of Minnesota and Mayo Clinic also bring expertise in such areas as stem cell & islet cell research, nanotechnology, neurosciences, cancer research, genomics, plant genetics, bio-industrial products and renewable energy, immunology and epidemiology. Interesting facts include:

- There are an estimated 180 biotech-related companies in the state.
- There are 585 U.S. Food and Drug Administration (FDA) approved medical device establishments in the state.
- Approximately 2,500 medical device related patents were registered to Minnesota companies between 2001 and 2005.
- According to the Milliken Institute, Minnesota has the highest number of investigational medical devices and FDA pre-market approvals of medical devices per 100,000 residents.
- Ranks second only to California in concentration of employment in the medical device industry.

Prominent Minnesota organizations with activities in life sciences, by product category, include:

Medical Technology

- Cardiovascular technologies such as heart valves, pacemakers, defibrillators and stents (Medtronic, St Jude Medical, Boston Scientific, Inc.)
- Catheter technologies (**Medtronic, St. Jude Medical, Boston Scientific, Inc., Smiths Medical**)
- Drug delivery systems (**3M, Cima Labs, Inc., Medtronic, Smiths Medical**)
- Dialysis products (**Minntech**)
- Impotence products (**American Medical Systems**)
- Electrotherapy (**Medtronic, St. Jude Medical, Compex Technologies, Inc., Empi Inc.**)
- Spinal implants (**Sulzer Spine-Tech**)
- Warming products for hypothermia (**Arizant, Inc.**)
- Hearing aids (**Starkey Laboratories, Miracle Ear**)
- Eyewear lenses (**BMC Industries, Soderberg Ophthalmic Services**)
- Medical device contract manufacturing (**ev3, Inc., Lake Region Manufacturing, Medsource Technologies, Surgical Technologies**)
- Drug-eluting coating process for medical devices (**SurModics**)
- Drug-coated stents (**Boston Scientific, Inc, Medtronic**)

Pharmaceuticals

- Cardiology (**Upsher-Smith, Solvay Pharmaceuticals**)
- Oncology (**MGI Pharma**)
- Dermatology (**Upsher-Smith**)
- Gastroenterology, mental health (**Solvay Pharmaceuticals**)
- Immune system enhancing compounds (**Biothera**)
- Women's health (**Solvay Pharmaceuticals**)
- Orally disintegrating dosage forms and contract manufacturing (**Cima Labs, Inc.**)
- Bioequivalent generic pharmaceuticals (**Paddock Laboratories; Upsher-Smith**)
- Animal health drugs (**Intervet; Newport Laboratories**)

Human Health Microbiology

- Contract R&D laboratories (**ATG Laboratories; ViroMed, Apptec Laboratory Services**)
- Cell culture products (**ViroMed; Apptec Laboratory Services**)

- Immunoassay test platforms and kits (**Beckman Coulter**)
- Cytokine-related reagents (**R&D Systems**)
- Immunoassay and conjugate stabilizers (**SurModics**)
- cGMP manufacturing services (**Apptec Laboratory Services**)
- Occupational health testing (**Medtox Scientific, Inc.**)

Agricultural and Industrial Biotechnology

- Agricultural chemicals (**Cargill, Inc., Cenex Harvest States**)
- Specialty cleaning and sanitation preparations (**Ecolab**)
- Sanitary products (**H.B. Fuller**)
- Prepared feed and feed ingredients (**Land O'Lakes Agricultural Services, Archer Daniels Midland, Cargill, Inc.**)
- Crop services (**Land O'Lakes Agricultural Services, Syngenta Seeds, Cenex Harvest States**)
- Biofuels (**Cargill Dow, LLC, Minnesota Corn Producers- ADM**)
- Biopesticides (**Syngenta**)
- Soybean processing (**ADM, Cenex Harvest States, Ag Processing, Inc.**)
- Plant biopolymers/fibers (**Cargill Dow**)
- Industrial Lubricants (**Cargill Dow**)

Canadian Government Contacts

Consulate General of Canada in Minneapolis

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Internet: <http://www.minneapolis.gc.ca>

Useful Contacts and Internet Sites

Minnesota Government Contacts

- Department of Agriculture (<http://www.mda.state.mn.us>)
- Department of Natural Resources (<http://www.dnr.state.mn.us>)
- Pollution Control Agency (<http://www.pca.state.mn.us>)
- Department of Health (<http://www.health.state.mn.us>)
- Department of Labour & Industry (<http://www.doli.state.mn.us>)
- Department of Administration (<http://www.admin.state.mn.us>)
- Board of Medical Practice (<http://www.bmp.state.mn.us>)

Trade Associations

- LifeScience Alley (<http://www.lifesciencealley.org>)
- The BioBusiness Alliance of Minnesota (<http://biobusinessalliance.org/>)
- Minnesota High-Tech Association (<http://www.mhta.org>)

Iowa Government Contacts

- Official State Website, searchable for all state government agencies (<http://www.iowa.gov>)
- Department of Agriculture (<http://www.agriculture.state.ia.us/>)

- Labour Services Division (<http://www.iowaworkforce.org/labor/>)
- Department of Commerce (<http://www.state.ia.us/government/com/>)

North Dakota Government Contacts

- State Government Portal (<http://www.nd.gov/>)
- Department of Commerce (<http://www.ndcommerce.com/>)
- North Dakota University System Portal (<http://www.ndus.edu/>)

South Dakota Government Contacts

- State Government Portal (<http://www.sd.gov/>)

Nebraska Government Contacts

- State Government Portal, searchable (<http://www.nebraska.gov/index.phtml?section=no>)

^[1] *The Government of Canada has prepared this report based on primary and secondary sources of information. Readers should take note that the Government of Canada does not guarantee the accuracy of any of the information contained in this report, nor does it necessarily endorse the organizations listed herein. Readers should independently verify the accuracy and reliability of the information.*