Biotechnology

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Biotechnology uses the basic ingredients of life - living cells and materials produced by cells - to make new products: pharmaceutical, diagnostic, agricultural, environmental and other. Biotechnology also alters genetic information in animals and plants in order to improve them. [AccessExcellence.org, Bio Career Guide Introduction].

OVERVIEW

Biotechnology today is an expanding growth industry, with about 1500 companies currently in the US (fall, 2002). It has historical roots in such common activities as selectively planting seeds to yield desirable crops and using living organisms to help make beer and bread. The current boom can be traced to 1953 when Watson and Crick discovered the double-helix structure of DNA, enabling scientists to understand cell regeneration and perpetuation. Ongoing discoveries in molecular biology have continued to increase our ability to control cell functioning. Commercial applications of biotechnology include:

- AgBio: developing new strains of plant or animal species and enhanced new food products.
- Genomics: identifying genes and how they work in humans, other animals, microbes, plants.
- Human Diagnostics: identifying the presence or absence of specific chemicals or proteins that may indicate disease or malfunction of human processes.
- Medical Devices: developing therapeutic treatments based on the fundamental design principles that guide biological organization at the molecular, cellular and tissue levels. …developing engineered products that repair and aid in the healing of injuries and other human and animal medical disorders.
- Medical Therapeutics: (the largest sector in Massachusetts): developing and producing new and unique drugs for the treatment of human diseases and disorders.
- Scientific Equipment and/or Supplies: providing laboratory equipment and supplies to biotechnology companies
- Scientific Services: research, production, laboratory safety and facilities management services
- Other: developing applications, such as environmental and veterinary.

Biotechnology companies tend to cluster in locales where there are colleges and universities providing highly trained researchers with cutting-edge skills. Boston, with about 280 companies, and the San Francisco Bay area, are popular venues for biotech start-ups and relocators. Companies vary significantly in size. Small companies tend to focus on research and development of biotech products, whereas larger companies also focus on producing and delivering commercial products to consumers.

CAREERS IN BIOTECHNOLOGY

Occupations and Salary: Some occupations within the biotechnology field include scientists and researchers, engineers, computer specialists, business and marketing professionals, manufacturing and production people, medical associates, statisticians, regulatory affairs specialists, writers, and attorneys. Industry specific salary information:

MIT Graduates: http://web.mit.edu/career/www/infostats/graduation.html
Salary.com - http://www.salary.com/salary/layoutscripts/sall_display.asp

Majors: While students from many different disciplines find this field attractive, MIT students interested in biotechnology are likely to major in biology, chemistry, brain and cognitive science, chemical engineering, mechanical engineering, material science and engineering, and media arts and sciences. Related areas of interest to explore include bioengineering, biomedical engineering, and nanotechnology.

Graduate Programs: College graduates can find opportunities in biotech, though much of the ground-breaking work is done by Ph.D.'s and Masters level graduates. Related graduate programs at MIT: Ph.D.s in Bioengineering and in Toxicology, an M.S. in Toxicology, and an M.E. in Biomedical Engineering.

For more information on careers see: http://www.massbio.org/directory/careers/index.html.
For career profiles of people in biotech see: http://www.accessexcellence.org/AB/CC/CP

Biotechnology Continued

EXPLORATION RESOURCES

BOOKS:
Directory of Biotechnology Companies, (2000). (Dewey Library HD9999.B44.G46)
GEN Database of Biotechnology Companies and Resources, (Dewey Library TP248.17.G46)
The Biotechnology Directory, (2002). (Dewey Library Reference HD9999.B443.U632)
Biotechnology VC Directory, (2003). (Dewey Library HD9999.B44.B56)
Plunkett's Biotech & Genetics Industry Almanac, (2004). (Dewey Library Reference HD9999.B44.P58)
Biotechnology Guide USA: Company, Data & Analysis, (1999). (Dewey Library HD9999.B44.U63 1999)
Medical and Health Care Marketplace Guide, (2003). (Dewey Library Reference HD9994.U5.M42)
Nature Biotechnology Directory, (2003). (Dewey Library HD9999.B443.U632)
The Massachusetts Biotechnology Directory (2000). (Hayden Library HD9999.B443.M4)

CAREER AND JOB SEARCH INTERNET RESOURCES:
Biotechnology
Access Excellence, http://www.accessexcellence.org
BioChem Net, http://biochemhub.com/biochem/jobs.cfm
Bio.Com, http://www.bio.com
Massachusetts Biotechnology Council, http://www.massbio.org
BioTactics, http://www.biotactics.com
BioCareer Center, http://www.biocareer.com /
Bio Find Jobs, http://www.biofind.com/jobs
Biotechfind, http://www.biotechfind.com /
Biotech Jobs, http://www.medzilla.com/biotech-jobs/
Biotechnology Industry Organization, http://www.bio.org/
BostonWorks.com Biotech Weekly eNewsletter , http://bostonworks.boston.com/biotech

Medical Devices
Mass Medical Device Industry Council, http://www.massmedic.com/
Medical Device Link, http://www.devicelink.com/links/

Professional Associations for Networking
Massachusetts Biotechnology Council, http://www.massbio.org
Biotechnology Industry Organization, http://www.bio.org/
American Association of Clinical Chemists, http://www.aacc.org
American Chemical Society, http://www.acs.org
American Society of Clinical Pathologists, www.ascp.org
American Society of Microbiology, http://www.asm.org
Clinical Ligand Assay Society, http://www.clas.org
Medical Device Associations, www.biotechmedia.com/Associations-MedDevice_Instr.html
Many states have Biotechnology Associations – check yours on www.google.com

Biotechnology-Related Research Centers at MIT
Biological Engineering Division, http://web.mit.edu/be/
Center for Biomedical Engineering, http://web.mit.edu/cbe/www/
Biotechnology Process Engineering Center, http://web.mit.edu/bpec/
Center for Environmental Health Sciences, http://cehs.mit.edu/
Bio-Instrumentation Laboratory, http://bioinstrumentation.mit.edu/
Bio-Micro Center, http://biomicro.mit.edu/

Biotech/Pharmaceutical Companies That Recruit at MIT

Allergan Inc.
Amgen, Inc.
BD Biosciences
Genentech, Inc.
LeadScope, Inc.
Merck Medco
QTI (Quantitative Technologies, Inc.)
Regeneron Pharmaceuticals, Inc.

MIT RESOURCES

Wetfeet Career Guide to Biotechnology
Careers in biotech and pharmaceuticals / WetFeet.
Dewey Library - | HD9999.B442.I67 2004

MIT Biomedical Engineering Society
http://web.mit.edu/bmes/www/

Alumni ICAN
http://alum.mit.edu/cs/ican/
**great resource for networking*