

Profile of Biomedical Research and Biotechnology Commercialization

New York–Northern New Jersey–Long Island Consolidated Metropolitan Statistical Area

Overview and History of Biotechnology in Metropolitan New York

The New York–Northern New Jersey–Long Island consolidated metropolitan area builds on an established strength as the center of the U.S. pharmaceutical industry. Several of the nation's largest drug makers have their headquarters in the region. New Jersey is known as the "Medicine Chest of the World." The region has strong educational resources as well, including Columbia, Princeton, and Yale universities and a number of free-standing research institutions.

The region benefits from the nation's largest concentration of financial capital and investment expertise. The combination of pharmaceutical industry management expertise, financial capital, and research has led to the formation of many new biotech firms in the region. In New Jersey these include firms specializing in genetic screening, computational genomics, and cloning technology. New York City's 46 medical schools and major research facilities and its 64 hospitals and medical centers provide potential for extensive partnership between academia and industry. New York City institutions and companies rank second among those of all U.S. cities in National Institutes of Health funding.

Yale University in New Haven, Connecticut, is a leader in medical research and has produced more than a dozen biotech start-ups in the past decade. A number of the largest local biotech firms have been started by Yale graduates based on their research, including Neurogen (founded in 1987), Curagen (1993), and Gennaisance Pharmaceuticals (1997). The state of Connecticut is working to promote biotechnology as one of its industry clusters.

The New York–Northern New Jersey–Long Island Consolidated Metropolitan Statistical Area includes the New York, Newark, and New Haven metropolitan areas and adjacent counties in Connecticut and Pennsylvania. The area had a year 2000 population of 21 million, making it the largest metropolitan area in the United States. During the 1990s population in the New York area grew by 8.4 percent.

Biomedical Research Activity in Metropolitan New York

The New York metropolitan area has a considerable amount of biomedical research activity. More than 4,700 life scientists work in the area, and there are 20 biological institutions granting life science PhDs, three of them ranking among the top 20 institutions nationally in life sciences research. Total NIH financial support flowing to the New York area is more than \$1.3 billion annually.

Table 1. Metropolitan New York: Indicators of Biomedical Research

Biomedical Research Indicators	Year	New York-Northern New Jersey-Long Island, NY--NJ--CT--PA CMSA
Life Scientists Employed	1998	4,790
Institutions Granting Life Science PhD Degrees	1999	20
Life Science PhDs Granted	1999	519
Universities Ranked among the Top 20 Nationally in Life Sciences Research	1982	3
Total NIH Financial Support	2000	\$1,382,530,715
NIH Funding for Medical Schools	1985	\$308,357
	1990	\$413,455
	1995	\$465,912
	2000	\$763,492
Biotechnology Patents	1975–79	1,420
	1980–89	3,590
	1990–99	6,800

The New York area is well endowed with research institutions that receive funding from the National Institutes of Health. Yale and Columbia universities received almost \$500 million in NIH research support in 2000, and Yale ranks ninth in NIH support.

Table 2. Metropolitan New York: Principal NIH–Funded Research Institutions, 2000

Rank	Institution	Research Grants	Grant Amount (in millions)	Total NIH Support (in millions)
9	Yale University	652	\$226.1	\$242.7
10	Columbia University	541	\$209.2	\$226.6
35	Yeshiva University	272	\$105.6	\$113.6
36	Mount Sinai School of Medicine of NYU	329	\$109.0	\$112.9
39	New York University	299	\$100.2	\$107.8
49	University of Medicine and Dentistry of NJ	243	\$79.5	\$85.6
66	Sloan-Kettering Institute for Cancer Research	157	\$63.5	\$66.2
73	Rockefeller University	122	\$54.5	\$58.0

Source: National Institutes of Health

Large pharmaceutical companies like Merck & Co., Bristol-Myers Squibb Company, and Schering hold the most patents in the New York area. These firms have been highly innovative during the last three decades. In addition, public institutions such as Columbia, Yale, and Rockefeller universities contributed to regional innovation beginning in the 1980s.

**Table 3. Metropolitan New York:
Top Biotechnology-related-Patent Holders, by Decade, 1975–1999**

Rank	Company Name	1970s	1980s	1990s
1	Merck & Co., Inc.	119	411	684
2	Individually Owned Patent	99	304	528
3	American Cyanamid Company	169	312	334
4	Bristol-Myers Squibb Company	127	308	324
5	Schering Corp.	73	186	295
6	Hoechst-Roussel Pharmaceuticals, Inc.		125	270
7	Colgate-Palmolive Company	126	114	192
8	American Home Products Corporation	5	43	158
9	Rockefeller University	1	28	134
10	Hoffmann-La Roche Inc.	56	101	131
11	Chesebrough-Pond's USA Co., Division of Conopco, Inc.		9	122
12	Columbia University		21	119
13	Warner-Lambert Company	34	92	104
14	ISP Investments, Inc.			85
15	Sloan-Kettering Institute for Cancer Research	1	39	78
16	Yale University		18	76
17	Research Foundation of State University of New York		7	74
18	New York University		13	73
19	Ciba-Geigy Corporation	46	93	72
20	Church & Dwight Co., Inc.		7	59

Source: U.S. Patent & Trademark Office, 2001

Biotechnology Commercialization in Metropolitan New York

The New York area has attracted more than \$639 million in venture capital investment in biopharmaceutical firms since 1995. Investments have been made in 63 new firms. The region has had 5 initial public offerings by biotech companies since 1998 and has attracted more than \$1.7 billion in pharmaceutical-biotech research alliances since 1996. The New York region has 77 publicly traded biotech companies with an aggregate market capitalization of more than \$52 billion. The industry includes 36 firms with more than 100 employees and 106 firms that are members of the national Biotechnology Industry Association.

Table 4. Metropolitan New York: Indicators of Biotechnology Commercialization

Indicator		New York-Northern New Jersey-Long Island, NY--NJ--CT--PA CMSA
Venture Capital Investment, 1995–2001	Number	63
	Amount	\$639,099,000
	Share	7%
Venture Capital Firms among the 50 Most Active in Biopharmaceutical Investment	1995–2001	5
Number of Initial Public Offerings by Biotech Companies	1998–2001	5
Value (in millions) of Research Alliances between Pharmaceutical Companies and Local Biotechnology Companies	Prior to 1990	\$149
	1990–1995	\$724
	1996–2001	\$1,729
Number of Publicly Traded Biotechnology Companies	2001	77
Market Capitalization (in millions) of Local Biotechnology Companies, 2001	2001	\$52,520
Local Biotechnology Firms Established	through 1980	25
	1981–1990	59
	1991–2001	38
	Not Available	5
	All Firms	127
Local Biotechnology Firms with More than 100 Employees	2001	36
NAICS 3254: Pharmaceuticals	Establishments	130
	Employment	22,578
NAICS 5413: Life Sciences R&D	Establishments	382
	Employment	14,328
Number of Members of the Biotechnology Industry Organization (BIO)	2001	106

The area's three largest biotechnology firms are Berlex Laboratories (1,450 employees), Schein Pharmaceutical, Inc. (1,325 employees), and Novo Nordisk North America (1,186 employees).

Table 5. Metropolitan New York: Principal Biotechnology Firms

Company	City	Employment	Segment
Berlex Laboratories Inc.	Wayne	1450	Therapeutics
Schein Pharmaceutical Inc.	Florham Park	1325	Therapeutics
Novo Nordisk North America Inc.	New York	1186	Therapeutics; Animal Agriculture
Curative Health Services	Hauppauge	678	Therapeutics; Bioseparations; Cell Culture; Cosmetics/Health/Beauty Products
IMPATH Inc.	New York	630	Testing/Analytical Services; Clinical Diagnostics; Bioinformatics
Amersham Pharmacia Biotech Inc.	Piscataway	600	Cell Culture
Pharmacoepia Inc.	Princeton	504	Bioinformatics; Specialty Chemicals
Regeneron Pharmaceuticals Inc.	Tarrytown	437	Therapeutics
Ortho Biotech Inc.	Raritan	430	Therapeutics
Diagnostic Technology Inc.	Hauppauge	10	Clinical Diagnostics; Cell Culture; Immunological Products; Bioseparations

Source: Institute for Biotechnology Information, 2001

Table 6. Metropolitan New York: Venture Capital Investment in Biopharmaceutical Firms, 1995–2001

Year	Venture Capital
1995	\$43,670,000
1996	\$1,800,000
1997	\$38,984,000
1998	\$91,300,000
1999	\$115,200,000
2000	\$151,600,000
2001*	\$19,670,000

Source: PriceWaterhouseCoopers, 2001 (* Six Months)