The Center for an Urban Future
September 1999

New York New Jobs

# Biotechnology

## The Industry That Got Away

New York should be a natural breeding ground for the fast-growing biotechnology industry. The city is home to 25 major medical centers and 175 hospitals, research centers and laboratories; it is in close proximity to roughly 60 percent of the nation's pharmaceutical companies; and a multitude of venture capitalists are a quick cab ride away. But, despite these assets and years of high expectations, New York City has virtually no biotech industry to speak of.

In both Boston and the San Francisco Bay Area, a similar biomedical infrastructure built around the Massachusetts Institute of Technology (MIT) and Stanford has translated into ground-breaking entrepreneurial activity, tremendous investment, and rapid job growth in biotechnology. While New York City fell behind these high powered regions in the race to build a cluster of biotech firms more than a decade ago, it has more recently been leapfrogged by states and localities up and down the East Coast—from Connecticut to North Carolina—that have been pulling out all the stops to attract growing biotech firms and entrepreneurs.

*continued on next page*

As a result, these areas are increasingly beating New York to the punch to win federal research grants and attract top-flight scientists, faculty and students. New York's diminishing share of research grants from the National Institutes of Health cost the state $350 million in 1996 alone. In addition to losing potential revenue and jobs, the city's failure to develop a viable biotech industry is in turn affecting the competitiveness of New York's biomedical/health care complex, which is the city's largest industry.

Over the course of a three month investigation, the Center for an Urban Future examined why the city has let this industry slip away and looked for ways to resuscitate this high-potential sector.

New York has missed the boat on the biotechnology industry primarily because the city has always lacked an infrastructure to support a growing biotech sector.

Most importantly, there is a serious shortage of affordable lab space, making it virtually impossible for start-ups and growing firms to remain in the city. For this reason alone, dozens of entrepreneurs and successful companies that sprouted up in New York have relocated to cheaper space in research parks, incubators and renovated factory buildings in Stony Brook, Princeton, Tarrytown and other nearby areas.

Numerous other entrepreneurs have fled New York because the city has never developed any "buzz" surrounding the city's biotech industry. Other areas that were able to retain and attract a "cluster" of biotech firms have managed to feed off their own success and attract private investment, spawn new start-ups and lure top scientists and students. New York's inability to achieve a critical mass of biotech firms has in turn made it exceedingly difficult to convince entrepreneurs to take a chance on the city. Many venture capitalists choose not to invest in New York-based biotech firms because they do not view the city as a receptive climate for biotechnology firms to thrive and grow.

Since the industry's inception, city and state officials have never grasped the economic potential of biotechnology or demonstrated the will to craft creative solutions to the unique challenges faced by the industry. While other states have been developing subsidized space for biotech firms in incubators and other high-tech facilities, New York City has just one building that is suitable for biotech start-ups. But even this facility—an incubator developed by the city, state and Columbia University—is beyond the price range of most start-ups.

The city's academic medical centers also share the blame. Unlike MIT, Stanford and other institutions around the country, New York's medical centers have a reputation for standing in the way of turning scientific discovery into entrepreneurial endeavors. The city's medical institutions have a long history of competing with one another instead of collaborating to strengthen the industry.

New York government officials and academic medical leaders may finally be getting the hint. Last December, Mayor Giuliani announced the formation of a biotechnology task force made up of leaders from many of the city's leading biomedical institutions to come up with a long-term plan to strengthen the industry. It's not too late to turn things around. But it won't happen unless city and state officials agree to dedicate the resources necessary to implement recommendations made by the task force and, equally important, the city's medical institutions begin to work together.

Finally, New York's failure to respond to the challenges faced by biotech firms should also serve as a lesson of what could happen in other industries if the city does not undertake a sector-based economic development strategy that works closely with industries. The story of New York's biotech industry should also be an example to everyone interested in creating jobs and improving the economic health of the city.

## What is *Biotechnology?*

The biotechnology industry took its first giant step forward in 1976 when two California entrepreneurs founded the first biotech company, called Genentech, to develop and market products based on recombinant DNA technology, or genetic engineering. The use of biotechnology—the process of using living organisms to develop breakthrough drug products, vaccines and genetically engineered food products—has been growing rapidly ever since.

Today, there are nearly 1,300 biotech firms in the U.S. conducting scientific research, undertaking clinical trials, and manufacturing products. The industry has produced more than 80 drugs and vaccines that have been approved by the U.S. Food and Drug Administration, while hundreds of others are currently under development. These medicines treat various cancers, Alzheimer's, heart disease, multiple sclerosis, AIDS and other conditions.

The industry, which spent $9.9 billion in research and development in 1998, is mostly made up of small firms that have well-paying jobs ranging from scientists to lab technicians.

# Falling Further Behind

Biotechnology has been one of the nation's fastest growing industries since its inception roughly 20 years ago. But this growth has completely bypassed New York City.

## NEW YORK CITY SHOWS LITTLE GROWTH IN NUMBER OF BIOTECH FIRMS COMPARED TO LONG ISLAND AND BOSTON

**Total Biotech Companies**

| | 1991 | 1996 | 1999 |
|---|---|---|---|
| NYC | 16 | 27 | 20 |
| Long Island | 28 | 47 | 53 |
| Boston Area | 88 | 186 | 250 |

Source: 1991 and 1996 figures for NYC and Long Island taken from study by Dr. Kelvin Willoughby for the NY Biotechnology Association and the Center for Biotechnology; 1999 figures are estimates by the NY Biotechnology Assocation. All Boston figures provided by Massachusetts Department of Economic Development.

## NEW YORK CITY TRAILS LONG ISLAND, UPSTATE AREAS IN BIOTECH JOB GROWTH

| | Total Jobs June 1991 | Total Jobs Dec. 1996 | % Job Growth |
|---|---|---|---|
| NYC | 527 | 563 | 6 % |
| Long Island | 826 | 2645 | 69 % |
| Lower Hudson | 981 | 1182 | 17 % |
| Albany | 99 | 254 | 61 % |
| Midwest | 318 | 613 | 48 % |
| Southern Tier | 73 | 710 | 90 % |

Source: Dr. Kelvin Willoughby, Center for Biotechnology & New York Biotechnology Association

The city had only 27 biotech firms, employing 563 people in 1996, according to a 1997 report conducted for the New York Biotechnology Association (NYBA) and the New York Center for Biotechnology. While this is hardly a number to cheer about, there are even fewer firms today. Guadalupe Cipres, the technology development associate at NYBA's New York City office, estimates that there are just 20 biotech companies in the city today.

This is not only embarrassingly low compared to biotech centers like the San Francisco Bay Area, which has 59 public companies and 22,200 industry jobs. It also puts New York substantially behind several Northeastern cities that are relative newcomers to the industry. The Philadelphia area, for instance, has a total of 60 biotech companies and Birmingham, Alabama even boasts at least 19 biotech firms. In addition, New York City now lags behind four other regions in the state in biotech industry employment.

At best, the city has been treading water while many other major cities and states are experiencing rapid growth. The 1997 study for the Center for Biotechnology found that between 1991 and 1996 employment in the city's biotech industry grew by only 36 jobs, a mere 7 percent increase. In contrast, biotech companies on Long Island created 1,819 new jobs during the same period, a 220 percent increase. North Carolina's bioscience industry has grown from fewer than 40 companies in 1986 to more than 100 today, spurred on by substantial government and private sector investment around the Research Triangle. North Carolina's biotech industry now employs more than 19,000 people.

Given its space and cost constraints, the city cannot realistically expect to attract a significant number of large biotech firms. But there is no reason New York shouldn't be able to cash in on its massive biomedical infrastructure and develop a significant presence of start-ups and small companies. Until now, however, the city hasn't even come close to reaching its potential to be a major breeding ground of new businesses. And it has had tremendous difficulty holding onto start-ups once they are ready to grow into bigger space. In fact, eight of the 16 biotech firms in the city in 1991 moved away or went out of business over the next five years.

There is no reason the city shouldn't be able to cash in on its massive biomedical infrastructure and develop a significant presence of biotech start-ups and small companies.

# Lack of Commitment From City and State Officials

By all accounts, city and state officials have never fully comprehended the enormous economic benefits that would result from a significant cluster of biotechnology companies in New York City. To date, no mayor or governor has dedicated the relatively modest resources required to develop this important industry in the city.

For years, the city and the state have lacked a long-term comprehensive strategy for preserving and building on New York City's biotechnology industry. While other states were addressing important industry concerns—such as the high cost of building out lab space, the difficulty attracting seed capital, and the problems of navigating government bureaucracy—city and state officials were avoiding the issue. As a result, scores of firms spun out of the city's huge biomedical complex have chosen to grow their businesses elsewhere, costing New York revenue and jobs.

New York's lack of commitment was evident in June 1998 when the city hosted BIO '98, the industry's national convention. Although many said that it was a coup that the city was chosen to be the host site since New York is considered, at best, a minor player in the industry, those in attendance felt snubbed when neither the mayor nor the governor made an appearance. Governor Pataki was slated to be the event's keynote speaker, but had to cancel at the last minute. The governors of Pennsylvania, New Jersey, and Connecticut all attended the event to tout their states as a place to do business.

Numerous local biotech entrepreneurs interviewed for this report singled out the Governor's absence at BIO '98, underscoring the sense of alienation felt by most locally-based biotechnology firms. This frustration may be attributed to the fact that, unlike other places, the city's biotechnology industry is a mere blip on the radar screen compared to driver industries like finance, advertising, media and the arts. But the feeling of alienation also emanates from years of neglect from city and state officials.

For starters, local biotech firms are often frustrated by the absence of a single government official who understands the problems unique to the industry or someone whose job it is to help guide individual firms through the bureaucracy. An official at the Empire State Development Corporation who worked with a variety of high-tech industries was generally viewed as a knowledgeable and helpful advocate for biotech firms. But this individual was reassigned more than a year ago and the state has yet to hire someone to fill the position.

Several business owners and industry advocates interviewed for this report couldn't name a single person in city government as the point person for dealing with biotechnology companies. Earlier this year, the city did set up a toll-free biotech hotline (1-877-NYC-4-BIO) to assist new and existing biotech firms. Though this is clearly a start, many industry officials openly wonder what took so long.

In contrast, two years ago the state of Maryland hired one individual to work specifically with the biotechnology industry. But instead of simply reassigning a staffer at the state's economic development agency, Maryland intentionally hired a former biotech entrepreneur with years of experience in the field. The city of San Diego, home of one of the nation's most vibrant biotech clusters, also hired a biotech liaison in 1993. So have states like Massachusetts and Connecticut.

Cities and states that have done this give local biotech firms a knowledgeable advocate inside government. They also send a message to the industry that their government officials are committed to the sector's growth. New York could take this important step at a minimal cost. Massachusetts, for example, spends just $75,000 annually to fund its liaison to the biotech industry.

It's important to also note that New York State programs targeted at biotechnology firms have consistently neglected New York City in favor of Long Island and a handful of upstate areas. For instance, in this year's State of the State address, Governor Pataki pledged $5 million in state funds toward the creation of a new biotechnology research center in Buffalo and an increase in the state's support for SUNY Albany's biotechnology incubator. Last year, the governor unveiled a plan to provide $22 million in state funding to establish six incubators in biotechnology, software, and other emerging technologies on Long Island. And back in 1990, the state pumped in roughly $6 million into the development of the Long Island High Tech Incubator, which dedicates two thirds of its 75,000 square feet to biotechnology firms.

Finally, the state's Science and Technology Foundation administers two Centers for Advanced Technology that provide technical assistance for biotechnology firms. But these centers are located on Long Island, at SUNY Stony Brook, and at Cornell University in Ithaca.

Meanwhile, the only major commitment by either the city or the state to develop biotechnology in New York City occurred in 1993, when they jointly provided a total of $18 million to help Columbia University develop the Audubon Biomedical Science and Technology Park. This incubator facility, which is located across the street from New York Presbyterian Hospital, was an important first step to develop the city's enormous potential for biotechnology. But it was the first and last step. The public sector has completely abandoned the industry since then.

As a result, the Audubon incubator—the city's only real home for commercial biotechnology—has just 12 biotech firms employing fewer than 200 people. Its 40,000 square feet of developed space has long been full, and Columbia University has only recently begun to develop the final 10,000 square feet of available space at the facility.

# Nowhere to Go: The City's Lack of Affordable Lab Space

There has never been a shortage of biotechnology firms that wanted to be in the city. But, from the industry's inception, New York's lack of affordable lab facilities has forced biotech entrepreneurs and growing firms to take their business elsewhere.

"The city has all of these medical research institutions, but there are no places for new firms to go after they get spun out," says Karen Duncker, the executive director of the Long Island-based New York Biotechnology Association. "Our New York City office is constantly getting calls from companies looking for space."

While the city's high real estate prices have been a sore spot for businesses in many industries, biotech entrepreneurs face a number of problems that are unique to the industry. For one, biotech start-ups typically spend years conducting scientific research and clinical trials before they can even think about making a profit. Dependent on loans and seed capital from outside investors to get them through their early development years, biotechnology entrepreneurs are reluctant to spend limited resources on New York's high rental costs. Second, unlike software firms, which have been able to survive the city's high real estate costs because they can make

## Models to Follow: *New Jersey and Connecticut*

While neither the mayor nor the governor have made a major financial commitment to the city's biotech industry since 1993—when the city and state teamed with Columbia University to build the Audubon Biomedical Science & Technology Park—both New Jersey and Connecticut have recently undertaken comprehensive biotechnology strategies that have already started to show impressive dividends.

Connecticut has embarked on an ambitious plan to help the state's biotech industry grow. As part of the state's cluster-based economic development initiative, it established a "BioScience Cluster" last year. After a working group of government officials and biotech industry leaders identified the constraints of doing business in Connecticut, the state hired a "life science specialist" with both industry and university experience. In addition, the governor and legislature allocated $20 million in state funds to create a loan fund aimed at creating 150,000 square feet of new laboratory and incubator space for biotech companies.

Connecticut's new strategy is already paying off. The state's venture capital arm, Connecticut Innovations, recently made a $950,000 direct loan that enabled one New Haven firm to expand into an additional 12,000 square feet of space and leverage another $10 million from private investors. It also approved a $2.25 million loan to help create 15,000 square feet of lab space for two Yale University biotech spinouts that had been considering space options in New Jersey.

Meanwhile, in New Jersey, a new 60,000 square foot technology building for biotech and other high-tech firms is scheduled to open later this year. The building, which was made possible when the state spent $9 million to acquire the 50-acre site in North Brunswick, will offer below-market rental prices.

Last year, New Jersey created a seed capital fund for technology-based businesses and also enacted a landmark law that allows new or expanding biotech firms to sell their unused net operating loss carryover and unused research and development tax credits to corporate taxpayers in the state for at least 75 percent of the value of the benefits.

use of raw space in most office and loft buildings throughout the city, biotechnology companies need specially outfitted laboratory space that is expensive to build and requires special zoning allowances. Finally, most commercial landlords are not willing to take the risk of building out this specialized space for a biotech firm that may be bought out by a larger company or go under for a lack of financing.

For these reasons, biotechnology start-ups—perhaps more than firms in any other industry—are dependent upon subsidized space in facilities that house a small cluster of similar firms. Throughout the country, biotech start-ups and growing firms have thrived in incubator buildings and research parks. Many of these facilities were initiatives of universities and medical institutions, but a number were pioneered by state and local governments.

Other cities and states, from Worcester, Massachusetts to Birmingham, Alabama, started building biotech incubators in the early- and mid-1980s. In contrast, it wasn't until 1995 that New York City's first biotechnology incubator finally opened its doors—nearly 12 years after it was initially proposed. The center, the Audubon Biomedical Science & Technology Park, filled up soon after it opened. Mitch Gipson, the facility's executive director, says that he has to turn away at least one prospective tenant every month. "If someone came to me now and wanted even 500 square feet of space, I'd have to tell them I didn't have it."

Throughout the 1990s, a long list of biotech companies born in New York City have had to leave just when the going got good, costing jobs and revenue and contributing to the image that New York is a poor place to launch.

Even though it was heavily subsidized by the city and state, the Audubon incubator is hardly a bargain for biotech entrepreneurs. Space at the facility now goes for $30 to $35 a square foot, primarily because Columbia relies on rental payments to offset the high cost of building out state-of-the-art lab space. In contrast, biotech firms at the Long Island High Tech Incubator are paying approximately $16 a square foot. Lab Space at government-supported incubators in other states usually runs less than $20 a square foot.

Even with the relatively high rental costs, Audubon is the only game in town for biotech companies. Since it has no vacancy, even firms that can afford to pay Audubon's rents have had no other choice but to search for space in New Jersey, Westchester, Long Island or other parts of the country.

"Audubon is the only attempt in the city to do something useful. But it's not enough," says Dr. Ron Cohen, who moved his growing biotech firm, Acorda Therapeutics, out of the city last August because he couldn't justify paying the rent at Audubon. The company, which developed a drug that restores nerve functions to damaged spinal chords, has grown from four to 25 employees since it left the city.

This wasn't the first time Cohen was involved in a start-up that fled New York because of the lack of lab facilities. Advanced Tissue Sciences, Inc., a firm he helped get off the ground in 1986, moved to San Diego three years later. By the time Cohen left the company in 1992, it had grown from 10 employees to more than 100. Today it has 220.

While it is clear that the lack of affordable lab space has prevented the city from holding onto dozens of start-ups that have been spun out of the city's impressive academic medical institutions, an equally grave problem is that New York has never been able to retain biotechnology firms that grow past the start-up stage. Throughout the 1990s, a long list of companies that were born in the city have had to leave New York just when the going got good, costing the city jobs and revenue and contributing to the image that the city is not a conducive environment for biotechnology.

A case in point: Sugen, Inc., a company formed by scientists at New York University, was purchased by Pharmacia & Upjohn in June for $650 million. Like many other biotech superstars, Sugen's impressive growth occurred outside New York. In 1991, soon after getting started, the company moved to Northern California, where it grew from a handful of employees to a workforce of 250 and became a worldwide leader in target-driven drug discovery and development for novel development stage cancer therapies.

New York's space limitations may make it impossible to retain the biggest, most successful firms. But while city officials have come to the aid of large investment banks, publishers and new media firms, they have largely ignored the space needs of growing biotech firms.

This was evident in 1994, when the city blew a

# *No Room To Grow: A Biotech Firm Is Forced Out*

The lack of affordable lab facilities recently forced C. Wayne Bardin to give up his plan to keep his new biotech firm in New York. A scientist at Rockefeller University for years and a longtime New Yorker, Bardin started the Thyreos Corporation 19 months ago and, a few months later, received financing for his business. He immediately began pounding the pavement in search of lab space in the five boroughs where his firm could use biotechnology to develop non-toxic drugs for cancer.

He applied for space at the Audubon facility earlier this year, but was told that nothing was available. He says he later reached an agreement to move into a lab at a state institution on Staten Island, but the state pulled out of the deal at the eleventh hour when its attorneys decided that Bardin's plan to conduct clinical trials could open up the state to potential lawsuits. He then moved into a temporary office in Midtown's Greybar building, where he could organize clinical trials and buy some time until he could find a lab space that would allow the firm to conduct necessary scientific experiments.

But in June, with no good prospects for locating lab space in the city, Bardin threw up his hands and signed a lease for 2,000 square feet in an old warehouse in Newark, paying $12 a square foot. It's not top-of-the-line space, but Bardin says that's the last thing a start-up biotech firm needs. "Start-up companies do not need state-of-the-art space. If I rented space at $30 a square foot, my investors would look at me and tell me I had to be kidding. They'd tell me to get a warehouse where I could get space for $12 to $18 a square foot and get my company rolling."

"I really wanted to keep the business in New York but I just couldn't do it," adds Bardin, who expects to initially hire up to 10 employees after his company moves into its new space. "Trying to start up a biotech company in New York City is almost impossible."

golden opportunity to retain an up-and-coming biotech firm and, at the same time, address the long term space needs of New York's growing biotech industry. At that time, the city had been losing a number of promising biotech firms to the suburbs. And one of the only remaining firms, Cadus Pharmaceuticals Corp., was in jeopardy of leaving because it was having a difficult time locating affordable lab space in Manhattan to expand its business.

City officials put forth a bold plan to establish a 140,000 square foot biotech building on Hudson Street, the first real attempt to create a facility in New York for both start-ups and firms that had grown out of the incubator stage. With the real estate market still reeling from the recession of the early '90s, the city was going to buy an old manufacturing building and guarantee the mortgage payments, while a private developer would come in and build out lab space and run the building. Cadus agreed to be the lead tenant and take 20,000 square feet, with an option to expand into another 20,000 feet.

However, in late 1994, the city pulled the plug on the deal, saying that it would not go through with the project unless it had a commitment from biotech firms to rent at least 60,000 square feet in the building. In December 1994, Cadus Pharmaceuticals moved to Tarrytown, where it quickly grew to 100 employees from less than 20 and now leases a total of 40,000 square feet, the same amount of space that it could have had on Hudson Street if the city had gone through with its deal.

The city's inaction not only resulted in the loss of 100 jobs and considerable revenues, but it was a missed opportunity to build the infrastructure needed to grow this industry. The incredible demand for space by biotech firms—Audubon's Mitch Gipson told the Center for an Urban Future that he received at least four calls in June from firms looking for space at the facility—demonstrates that the city would have easily been able to fill its biotech building on Hudson Street. "I'm sure if another space like Audubon were here, it would be filled with companies," says Guadalupe Cipres, the technology development associate at the New York Biotechnology Association's Manhattan field office.

In the years since the deal fell through, the city has continued to lose growing biotech firms to the suburbs. And the subsequent upsurge in the city's real estate market will likely preclude any future attempt to convert an underused manufacturing building into a biotechnology facility.

Meanwhile, a growing number of states have been undertaking projects to create subsidized space for biotech companies: Connecticut last year dedicated $20 million towards a fund for building new lab space; New Jersey helped fund a soon-to-be completed center for biotech and other high-tech firms in North Brunswick, 45 minutes from Manhattan; Maryland helped pay for a 50,000 square foot incubator for biotech and other companies that opened in January; and Georgia is helping to fund four separate biotech incubators that are currently in development. But, in New York, the fully occupied Audubon facility remains the lone attempt to develop affordable space for biotechnology.

# Access to Capital

Realizing that venture capitalists invest in only a handful of biotechnology firms, an increasing number of state governments have developed seed capital funds that help biotech entrepreneurs start up and grow. These public investments can be the difference between success and failure for firms in an industry in which companies typically go years before they are ready to market a product, much less turn a profit.

But in New York, biotechnology firms that can't scare up support from venture capitalists today have no public entity to turn to for seed capital funding. This wasn't always the case. Until Governor Pataki came into office in 1995, the state was kicking in between $2 million and $3 million annually to the Small Business Technology Investment Fund, a revolving investment and loan fund which can provide up to $400,000 to start-up and growth companies in a variety of high-tech industries. These relatively small government investments, which were made only after recipients put up matching funds from other sources, often leverage significant investment by private financiers. For instance, Progenics Pharmaceuticals, Inc. more than doubled in size after receiving $350,000 from the program in 1994.

However the fund, which is administered by the New York State Science and Technology Foundation, has been left out of the governor's executive budget since 1995. As a result, it receives new money only by cashing in when companies it previously invested in go public. This has severely limited its ability to fund new start-ups. In fact, the last time the fund invested in a biotech firm was more than three years ago, when it put up a mere $108,365 for Geneva, N.Y.-based BioWorks. It has invested in just two other biotech companies since Pataki took office, neither of which were based in the city.

Entrepreneurs and established firms throughout New York consistently cite a need for more seed capital. One state official interviewed for this report said that while New York State's Science and Technology Foundation provides technical assistance to biotech firms through its Centers for Advanced Technology, companies have more of a cash problem than a science and tech problem. "We just keep hearing people say, 'I don't want your help. I need your money.'"

Ironically, the Small Business Technology Investment Fund was one of the first of its kind in the nation and has served as a model for other states. For instance, in 1993, Massachusetts created the Emerging Technology Fund with a $15 million authorization that can leverage $50 million in private financing to help build initial commercial production facilities for companies in biotechnology, advanced materials, and advanced environmental technologies. The North Carolina Biotechnology Center has provided 46 biotech-related firms with a total of $5.8 million for product research and development. According to North Carolina officials, the state's public investments have attracted an additional $332 million from federal grants, investors, public offerings, and other sources. In Connecticut, a state-funded investment program has provided $22 million to 28 biotech companies over the last 10 years.

The city's Economic Development Corporation (EDC) hasn't filled the void for biotech firms looking for seed capital. In 1995, the city did set up a public/private fund that was designed to make $1 million to $9 million investments in growing city-based "advanced technology businesses." According to EDC materials, this program—the Prospect Street NYC Discovery Fund—was designed to invest in an array of advanced technology industries, including biotech. However, an official at the fund says that the program was never intended to help biotech companies, a contention backed up by the fact that it has not made a single commitment to a biotech firm.

**THE LAST INVESTMENT IN BIOTECH FIRMS BY STATE'S SMALL BUSINESS TECHNOLOGY INVESTMENT FUND WAS MORE THAN THREE YEARS AGO**

| Date | Company | Location | Investment |
|---|---|---|---|
| 12/88 | Regeneron Pharmaceuticals | Tarrytown | $350,000 |
| 5/91 | United BioMedical | Lake Success | $250,000 |
| 9/91 | Innovir Laboratories | NYC | $250,000 |
| 8/94 | Progenics | Tarrytown | $350,000 |
| 3/95 | UCT International | Farmington | $250,000 |
| 7/95 | Tularik | Stony Brook | $150,000 |
| 2/96 | BioWorks | Geneva | $108,365 |

Source: NYS Science and Technology Foundation

# Failures of Academic Institutions

City and state officials aren't the only ones to blame for the anemic growth of biotechnology in New York City. The city's prominent and powerful academic medical and research institutions have, in many ways, stifled the development of commercial biotechnology by competing with one another instead of collaborating. In addition, the city's medical institutions have sorely lacked the entrepreneurial spirit that has been pivotal to creating biotech clusters in the San Francisco Bay Area, Boston, and the North Carolina Research Triangle.

Stanford and MIT, for instance, have encouraged faculty to engage in research and development in the private sector. In fact, MIT encourages faculty to spend as much as 20 percent of their time working on commercial endeavors. "Most of the companies that have been started [in the Boston area] come out of the university system," says Joe Donovan, Massachusetts' government liaison to the biotech industry. In California, one out of every five biotech firms was founded by a University of California staff member, according to a recent study.

In contrast, New York's academic medical institutions have been notoriously slow in encouraging university researchers to start up commercial businesses based on their clinical discoveries. And instead of spawning local firms to commercialize their own discoveries, New York's medical institutions have, to a large degree, licensed the commercial rights to their research to firms that are located out of New York, causing the city to lose potential revenue and jobs.

Not surprisingly, talented researchers and students have been increasingly bypassing New York's medical centers for institutions in other states that present better opportunities for potentially lucrative commercial endeavors.

Among all of the city's academic medical institutions, only Columbia University has developed a facility that allows their scientists to translate discoveries made at university labs into commercial enterprises. Yet even this project—the Audubon Biomedical Science & Technology Park—has been riddled by high rents and long delays in building out new space. It has also been criticized for excluding entrepreneurs that do not come from the Columbia orbit.

# The Effects of New York's Failure to Grow Biotechnology

The city's failure to cultivate a strong biotechnology sector has not only resulted in a loss of potential jobs and revenue, but it is one of the reasons that the city's once pre-eminent biomedical institutions have lost ground to medical centers in other regions of the country.

National Institutes of Health (NIH) funding for New York's biomedical institutions has dropped significantly over the past two decades while areas with established biotechnology clusters—the Bay Area, Boston, San Diego, Pennsylvania, Maryland, and North Carolina—have seen substantial gains in NIH research dollars. In 1981, New York City ranked first among all cities in the nation in total NIH funding, receiving 9.8 percent of the funds going to the top 100 cities. In 1996, the city trailed Boston and received only 7.3 percent of NIH grants going to the top 100 cities, a 26 percent drop since 1981. In 1996, New York City trailed 16 other cities, including Birmingham, Alabama, in the growth rate of NIH contracts and grants.

Moreover, only one of the city's medical institutions—Columbia University (11th)—ranked among the nation's top 20 recipients of NIH funding last year.

This is threatening New York's leadership in biomedical research and hampering the city's ability to attract the most talented researchers, students, and faculty. New York State actually had fewer NIH-funded research scientists in 1995 than it did in 1981. It was the only major research state in the nation to receive this dubious distinction. Jobs that were once located in New York are increasingly located in other areas of the country.

All of this spells trouble for New York's economy. A 1999 report for the Greater New York Hospital Association found that medical institutions generate $1 billion in total tax revenue for the city, bringing in a large percentage of their funds from out of state, and employ roughly 216,000 people in the New York Metropolitan region—that's considerably more than the securities industry.

# Cause for Optimism

Congress' recent decision to increase NIH funding by $2 billion has created a potential windfall for New York's biomedical institutions. This has lit a fire under government and medical officials to finally get their act together.

Last December Mayor Giuliani announced the creation of a mayoral task force on biomedical research and development that is supposed to recommend ways to improve the city's competitiveness in the biotechnology industry. Among other things, the task force is expected to come up with suggestions for creating new research parks.

A month earlier, the mayor announced that the city was investing up to $12 million in the New York Cancer Project, a collaborative research project involving 25 of New York's medical schools and academic medical centers. The group, known as the Academic Medicine Development Co., hopes to foster collaboration among medical institutions and increase New York's share of federal research funds.

Chasing the same goal, the region's major academic medical institutions formed the Biomedical Research Alliance of New York last year. The consortium hopes to develop a biomedical research park, set up a venture capital fund and lure new scientists to New York. Meanwhile, the New York City Partnership Policy Center and 10 local medical institutions helped set up the Structural Biology Center, a biology studies facility containing expensive high-field magnets.

On the state level, biotech firms hope to benefit from the passage of the Emerging Industries Job Act. This law, which took effect earlier this year, created two new tax credits for emerging technology firms. The state budget also created a $250 million venture capital fund. It remains to be seen, however, whether this fund will invest in biotech businesses.

These are encouraging signs. However, the mayor's task force has yet to release a report, fueling skepticism about the city's commitment to the industry. After all, in 1991, similar concerns over the decline in NIH funding to New York's biomedical institutions led to another task force, whose recommendations were largely ignored.

# Sources and Resources


**A. Ilan & Associates** (February 1999). "The Economic Impact of the Academic Medical Infrastructure on New York State and the New York City Metropolitan Region." A report for the Greater New York Hospital Association.

**Aries, Nancy R. and Elliott D. Sclar** (February 1998). "The Economic Impact of Biomedical Research: A Case Study of Voluntary Institutions in the New York Metropolitan Region," Journal of Health Politics, Policy and Law.

**Bonagura, David G. and Kenneth B. Lee, Jr.** (1995). "Biotech '95: New York State Meeting Industry Challenges," supplement to Ernst & Young's Ninth Annual Report on the Biotechnology Industry.

**The Center for Biotechnology** (March 1999). "Veni, Vidi, Inveni."

**Council on Biomedical Research and Development at the New York Academy of Medicine** (December 1997). "Report of the Ad Hoc Committee on Biomedical Research in New York State."

**Council of the City of New York Finance Committee Report** (October 1993). "Missed Opportunities: Is Biotechnology in New York City's Future?"

**Morrison, Scott W. and Glen T. Giovannetti** (December 1998). "Bridging the Gap: Ernst & Young's 13th Annual Biotechnology Industry Annual Report."

**Moss, Mitchell L.** (September 1996). "Why New York Is Flunking Biotechnology," Home Economics, the New York City Partnership Policy Center.

**Ross, D. Michael** (May 1999). "Resuscitating Biomed," Empire State Report.

**Sturman, Lawrence S., Martin D. Sorin, Elizabeth Larkins, Kathleen A. Cavanagh, Barbara A. DeBuono** (Summer 1997). "Losing Ground: NIH Funding to New York State Researchers," Bulletin of the New York Academy of Medicine.

**Willoughby, Dr. Kelvin W.** (July 1997). "New York's Evolving Bioscience Technology Industries." A report for the Center for Biotechnology and the New York Biotechnology Association.

# Recommendations and Solutions

## Proposed by the Center for an Urban Future

### Initiate a Sector-Oriented Economic Development Strategy

First and foremost, the city should undertake a sector-oriented economic development strategy designed to help nurture a viable biotechnology cluster and ensure that New York does not neglect other high-potential industries in the future.

### Demonstrate a Long-term Government Commitment to Biotechnology

The city will continue to miss out on the enormous economic benefits that come from having a significant cluster of biotechnology firms until the mayor and the governor demonstrate a long-term commitment to this important industry. Government leaders should take four immediate steps:

- *Create a government liaison to the biotechnology industry* — The state should hire an individual with substantial knowledge of the biomedical field to act as ombudsman between government and the biotechnology industry. This individual's close contact with industry leaders would enable government officials to quickly respond to the needs of firms that are at risk of leaving the city.
- *Market the strengths of the city's biotech sector* — City officials and local medical centers should undertake an aggressive marketing campaign to publicize the strengths of the city's biomedical industry and new government initiatives aimed at jump-starting the industry. This would help the city win back researchers and entice investors to take a closer look at New York-based biotech firms.
- *Offer a helping hand from Albany* — The governor must dedicate the same kind of resources for developing biotech facilities in the city that he has recently provided to Long Island and upstate cities.
- *Restore state funding to the Small Business Technology Investment Fund* — The governor and state legislature must restore full funding to this essential seed-capital program, which can be the crucial spark for early-stage biotech firms.

### Create More Incubators and High-Tech Research Buildings

New York will never be a serious player in the nation's biotech industry unless it finds a way to provide affordable lab space for both start-ups and growing firms. The city and state should dedicate resources and show leadership necessary to build subsidized research facilities and incubators.

City and state officials should also set up an incentive program for developers to build below market rate lab facilities. It could be modeled after the city's own plug-n-go program for new media firms.

The city planning department should come up with a list of potential sites where developers could create incubators and high-tech research buildings. Government shouldn't foot the entire bill, but it should create a fund to subsidize private developers and academic institutions that agree to keep rents affordable. In the immediate future, city and state officials should:

- Get behind the Bronx Borough President's longtime proposal to develop a 320,000 square foot biomedical science park at the state-owned Bronx Development Center. While it would require substantial public and private investment to build out lab space at the facility, the Pataki Administration should immediately turn over this 32 acre parcel, a surplus property whose location—in the Northeast Bronx, near the Albert Einstein College of Medicine—is accessible from Manhattan and Westchester medical and business centers.
- Expedite plans to develop a high-tech research center on state-owned land near the College of Staten Island and the Institute for Basic Research.
- Encourage Columbia University to build on the undeveloped space surrounding its Audubon Biomedical Science and Technology Park.

New York
New Jobs

## Advisory Board



## The Center for an Urban Future

is a policy institute dedicated to aggressively pursuing solutions to the most critical problems facing cities.

New York/New Jobs is a project of the Center for an Urban Future. Funders include the Bankers Trust Foundation, the Annie E. Casey Foundation, the New York Foundation, the New York Community Trust and the Taconic Foundation.

**This report was written by Jonathan Bowles.**
**Additional research by Marisa Arpels.**

**Kim Nauer, Executive Director**
**Neil Scott Kleiman, Director**
**Shalini Ahuja, Research Director**
**Jonathan Bowles, Research Director**

For more information call (212) 479-3347
**Visit our web site at www.nycfuture.org**

Center *for an* Urban Future

**City Limits Community Information Service**
120 Wall Street, 20th floor
New York, New York 10005