AUGUST 2002
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Center for an Urban Future

A Prescription for Failure

Albany's $200 Million Biotech Plan Bypasses NYC, the State's Best Chance To Grow the Industry

With the state economy in a protracted slump, Governor Pataki and state legislative leaders have made a big bet on the biotechnology industry to spur economic development across the state. But while there's no question biotech could be a growth industry in New York, Pataki and the Legislature haven't been willing to play their ace: New York City, the state's best chance for developing a large, self-sustaining biotech industry, has received virtually none of the nearly $200 million that state officials have invested in biotech-related economic development projects over the past four years.

Unlike most other industries, biotech has flourished in only a handful of metropolitan areas around the country. Without exception, those areas possess a handful of difficult-to-replicate assets: strong medical research institutions, access to private sector financing, a cluster of existing biotech firms and enough scientists to support the industry's growth.

Within the state, only New York City and its suburbs possess enough of these assets to produce a meaningful biotech sector anytime soon. The industry could eventually succeed in other parts of the state, like Buffalo and Rochester, both of which received significant state funds in recent years for biotech development projects. But the New York City area has the most potential for growth.

In part because of insufficient state financial support, New York City has never fully capitalized on its potential to be a leading biotech center. But the city's biotech sector finally could be on the cusp of significant growth: more than half of the city's biomedical research institutions have put forth viable proposals for building commercial biotech facilities; the chairman of the Lower Manhattan Development Corporation has endorsed a plan to build a biotech complex near Ground Zero and the New York City Partnership, the city's leading business advocacy organization, has made the development of a larger biotech sector one of its top policy priorities.

The state's decision to help grow the state's biotech industry could certainly pay off. Biotech is projected to be one of the nation's fastest growing industries over the next few decades and New York State possesses virtually all of the ingredients that have fueled the industry's growth in the few places where biotech has taken hold. Moreover, a larger biotech sector could help diversify New York's economy, an important benefit at a time when both the state and city are overly dependent on Wall Street.

But this report—the second major study issued by the Center for an Urban Future about New York City's biotech industry—documents that while the lion's share of the state's multi-million dollar biotech investment has gone to Buffalo, Rochester and Long Island, the overwhelming majority of the state's biotech assets are located in and around New York City. The report, a follow-up to the Center's 1999 report titled "Biotech: The Industry That Got Away," is based on more than a year of reviewing industry data and interviewing dozens of biotech industry officials in New York and around the nation.

As the following figures indicate, the report finds that no other region in the state comes close to matching the city's potential for growth in biotech:

- New York City has more biotech companies than any other part of the state. According to a 2002 report by the New York Biotechnology Association, 27 of the state's 89 biotech companies (30 percent) are located in the five boroughs—more than the six upstate regions combined.

- Most of the other biotech companies in the state are located in the New York City metropolitan area. Long Island has 23 biotech firms (26 percent of the state total) and the Lower Hudson region, centered around Westchester, has 14 firms (16 percent of the state total). In all, 64 of the state's 89 biotech companies are located in the greater New York City area.

- No other region in the state has more than seven biotech firms. The Midwest region, centered around Rochester, has seven companies; the Buffalo region has six; the Capital Area, has five companies; the Southern Tier, which includes Syracuse, has four. Neither the North Country nor the Upper Hudson regions have any biotech companies.

- 11 of the state's 33 public biotech companies (33 percent) are in New York City. No other region in the state has more than 6 public biotech companies. 23 of the 33 (or 70 percent) are located in the New York City metropolitan area (including the city, Long Island or the Lower Hudson region).

- New York City is home to 88 of the 183 members (48 percent) of the New York Biotechnology Association, a statewide organization whose members include biotech firms, pharmaceutical companies, venture capitalists, law firms that handle biotech patent issues and other organizations involved in the industry. 45 of the members are located on Long Island (25 percent) and 21 are from the Lower Hudson region (11 percent), meaning that 154 of the 183 members are based in or around the city. No other region has more than nine.

- New York State has 10 medical institutions among the top 80 recipients of federal research funding from the National Institutes of Health. Eight of these are located in New York City.

- New York State has 196 scientists that are members of the prestigious National Academy of Sciences—more than all but two states (California and Massachusetts). At least 102 of these scientists (52 percent) are affiliated with institutions in New York City.

- 49 of the 57 major teaching hospitals in the state (86 percent) and eight of the state's 12 major medical schools (67 percent) are located in the New York City Metropolitan region, according to a 1999 report by the Greater New York Hospital Association. In addition, 86 percent of the jobs associated with the state's "academic medical infrastructure" are in the metro region.

- New York City's status as a regional hub for biotech research and development is enhanced by its proximity to dozens of biotech firms and pharmaceutical companies in Northern New Jersey. According to the Biotech Council of New Jersey, the state is home to 110 biotech firms, most of which are located in the northern half of the state. New Jersey also has more large pharmaceutical companies than anywhere else in the nation.

"The biotech industry has flourished best in this country in concentrated clusters grouped around strong academic research centers that supply ideas, personnel, consultants, and new spin-offs," says Dr. Harold Varmus, president of Memorial Sloan-Kettering Cancer Center and former director of the National Institutes of Health. "Currently, only the New York City metropolitan region, with its several strong medical centers, universities, and federally supported research activities, has the ingredients and the reputation necessary to develop a large, sustainable biotech industry. No other place in the state will be able to consistently churn out biotech start-ups and attract top scientists—things that are essential to create the critical mass of biotech activity needed to attract and support this industry."

Without additional financial support from the state, however, it's unlikely that New York City will ever realize its true potential. In the city, as almost everywhere else in the nation, state funds are critical to the development of biotech incubators and other commercial research facilities. Indeed, every proposal for new or expanded biotech facilities now being floated by city-based biomedical institutions hinges on some government support, a condition that isn't unique to the five boroughs. These projects are almost always subsidized with public funding because it's very expensive to build the highly specialized facilities required by biotech firms and because companies in the industry—most of which are small and largely dependent on venture capital financing—usually can't afford the high rents that developers would need to charge to make a profit.

Yet, while Governor Pataki and the Legislature have committed nearly $200 million for biotech development projects around the state over the past four years, very little of the money has gone to projects in New York City. Between 1999 and 2001, the state committed just $1 million in funding for New York City, while granting $30 million in funding for four biotech projects on Long Island, $7 million to Rochester, $5 million for Buffalo, and $1.3 million for Ithaca. While the state's investment in Long Island is a good start, any plan to take advantage of the potential for biotech growth in the New York City metro area must also include financial support for projects in the city. (See box on page 6 for a list of state-funded biotech projects.)

This year, the governor and legislature agreed to provide $550 million for three programs—Centers for Excellence, GeNYsis and Restore New York—that will largely fund high tech and biotech development projects around the state. In June, Governor Pataki announced that $110 million of this total will help establish a bioscience complex in Buffalo. (See box on page 8 for Centers of Excellence.)

But of the nearly $200 million already designated from these programs, not a cent has been earmarked for projects in New York City. In fact, all five Centers of Excellence announced by the governor will be outside of the city—the others include a center for nanoelectronics in Albany, a center for photonics in Rochester, a center for environmental systems in Syracuse and a center for wireless Internet and information technology on Long Island.

Most of the new funding from the GeNYsis and Restore New York programs will be allocated later this

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The Center for an Urban Future is a policy institute dedicated to aggressively pursuing solutions to the most critical problems facing cities.

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This report was made possible with generous support from the New York Community Trust and Taconic Foundation. Additional program support was provided by United Way of New York City and the Bernard F. and Alva B. Gimbel Foundation.

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New York City: the State's Best Hope For Biotech

Within the state, only New York City and its suburbs have the critical mass of biotech firms, academic research institutions and scientists that could lead to a meaningful lab-based biotech sector anytime soon. As the following four charts reveal, the city is home to more biotech companies, top medical research institutions and leading scientists than any other part of the state.

Number of Biotech Companies in NYS, by region (2002)

Region	# of Biotech Companies	% of Statewide Total
NYC	27	30%
Long Island	23	26%
Lower Hudson	14	16%
Midwest	7	8%
Buffalo	6	7%
Capital Area	5	6%
Southern Tier	4	4%
North Country	0	—
Upper Hudson	0	—

Source: New York Biotechnology Association (2002)

Members of the New York Biotechnology Association, by region (February 2002)

Region	# of Members	% of Statewide Total
NYC	88	48%
Long Island	45	25%
Lower Hudson	21	11%
Midwest	9	5%
Buffalo	6	3%
Capital Area	5	3%
Southern Tier	5	3%
North Country	0	—
Upper Hudson	0	—

Source: New York Biotechnology Association (2002)

NYS Institutions Among the Top 100 Recipients of NIH Funding (2000)

NIH Rank	Institution	Location of Institution
10	Columbia	NYC
28	Cornell	NYC/Ithaca*
35	Yeshiva/Einstein	NYC
36	Mt. Sinai	NYC
39	NYU	NYC
40	University of Rochester	Rochester
66	Sloan-Kettering	NYC
73	Rockefeller	NYC
77	NYS Psychiatric Institute	NYC
96	SUNY Buffalo	Buffalo

Source: National Institutes of Health
** Cornell's main campus is in Ithaca, but its medical school is in NYC.*

Members of the National Academy of Sciences in NYS, by Location (July 2001)

City	# of NAS Members
New York City	102
Ithaca	37
Long Island	21
Rochester	8
Albany	3
Buffalo	2
Syracuse	2
Lower Hudson Region	2
Binghamton	1

Source: National Academy of Sciences
Note: CUF could not identify where 4 other NAS members in NYS are based.

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year. The Pataki Administration recently hinted that it would soon "make a major technology-related announcement in the New York City area," but many industry insiders privately worry that New York City will receive an extremely small share of the pie for biotech projects.

While the state has not made a major investment towards the construction of new commercial biotech facilities in New York City since 1994—when the Cuomo Administration helped fund a biotech incubator developed by Columbia University—its Office of Science, Technology and Academic Research (NYSTAR) has provided a handful of grants to institutions based in the city, primarily for academic research projects. For instance, two of the eight Strategicaly Targeted Academic Research (STAR) centers funded by NYSTAR are based in the city. CUNY was awarded $15 million for its Structural Biology Center and Columbia received $11 million for its Integrating Imaging Center.

Two other city institutions—Mount Sinai and Manhattan College—received small NYSTAR grants for Advanced Research Centers (together, they received $1.4 million of the $11.8 million awarded around the state); NYU was one of four institutions from around the state to receive a NYSTAR grant to attract new faculty, and SUNY Downstate received $500,000 NYSTAR grant to help erect its biotech incubator.

While helpful, none of these NYSTAR grants comes close to the level of state support in the Governor's Centers of Excellence program, which completely excludes the city. And, except for the small grant to the SUNY Downstate, the NYSTAR programs don't help the city overcome one of the main obstacles to the growth of its biotech industry: the lack of commercial biotech facilities.

"Outside observers don't yet understand many of the details of the Centers of Excellence and GeNYsis programs, but… it's apparently been put together politically, and it follows politicians' natural tendency to 'level' support for competing jurisdictions rather than make strategic choices," says David Hochman, senior principal of the partnership practice at Battelle, a high-tech consulting firm, and director of its New York City office. "While upstate cities should certainly not be denied an opportunity to shape their technology futures, some hard choices may have to be made if we are to exploit the state's truly unique asset, which is undoubtedly the heavy concentration of academic R&D and developing clusters of bioscience startups around New York City and its Westchester and Long Island suburbs."

Biotech Projects Funded by the Pataki Administration

Buffalo

- $110 million to create a Bio-informatics research complex in Buffalo (2002).
- $5 million to establish a Biotechnology Research Center at SUNY Buffalo. (1999)

Long Island

- $16.5 million to construct the Broad Hollow Bioscience Park on the campus of SUNY Farmingdale. (1999)
- $8 million to expand a manufacturing facility for OSI Pharmaceuticals in Farmingdale. (2000)
- $4.5 million for construction of a biotech incubator at the North Shore University Hospital in Manhasset. (2000)
- $1 million to plan the Millennium Technology Center on the campus of SUNY-Stony Brook. (2000)

Rochester

- $7 million for the University of Rochester's Aab Institute of Biomedical Sciences. ($3 million provided in 1999 and $4 million provided in 2000)

Ithaca

- $300,000 to support a new science and technology center in Nanobiotechnology at Cornell University. (2000)
- $1 million to purchase high-tech equipment and fund a study of the potential of creating a "Genomics Corridor" in New York State. (1999)

State Support: The Seeds of Growth

The last time New York State invested public monies for a project aimed at building up New York City's biotechnology industry the result was a stirring success. The public funds helped Columbia University construct the city's first incubator for emerging biotech companies—a facility that has been fully occupied since soon after its opening.

The problem is, that state investment was made eight years ago and that incubator is still the only viable location in the city for biotech firms, despite increasing demand for private lab space. With no subsequent state support for building additional commercial biotech facilities, the city has been unable to build on the success of the Columbia incubator, which is known as the Audubon Biomedical Science and Technology Park. In the years since Audubon opened, in 1995, the city has lost at least a dozen biotech companies to other regions—often outside the state—mostly because these firms had no place else to go. There simply wasn't any space for companies that had grown to be too large to remain in an incubator or for the increasing number of firms being created by scientists at city-based research institutions. As such, biotech growth in New York stalled just as the field was taking off in other cities.

It's been no secret that the lack of additional space was one of the biggest obstacles to the city becoming a national leader in biotech. A number of reports issued over the past decade said as much, including a 1999 report by the Center for an Urban Future and a 2001 report by the New York City Investment Fund. In fact, the investment fund's study concluded that while the city's academic research institutions spin off about 30 new biotech-related businesses every year, virtually all of them move to other regions because there are no facilities for them in the city.

Yet, the state's biotech spending spree between 1999 and the present ignored this compelling evidence.

At least until recently, the state wasn't the only one to blame. The Giuliani Administration never created a coherent biotech strategy and didn't do enough to push its allies in Albany to allocate more of the state funds for biotech projects to New York City. At the same time, most of the city's research institutions, including universities and medical centers with the most to gain from a vibrant biotech field, failed to show the kind of initiative that their competitors in other regions, including the San Francisco Bay Area, the Boston area and San Diego, were pursuing with success in biotech development efforts. With just a couple of exceptions, the New York City-based institutions didn't aggressively push for the development of new commercial biotech facilities and didn't show a willingness to put up enough resources of their own.

Gaining Momentum

In the past few years, however, the city has been brimming with biotech activity. Most of the city's medical research institutions have realized that developing biotech is not only vital to the city's biomedical research base; but that this industry could take off in New York with the right investment from the private and public sectors. At least six proposals for new commercial biotech facilities in the city are now on the table or actually being implemented. These include:

- SUNY Downstate Medical Center, in Brooklyn, is already in the process of developing the first phase of a biotech incubator on its campus. Six companies have committed to being tenants and ImClone, the city's largest biotech company, is now building out 12,000 square feet of lab space adjacent to the incubator—despite its ongoing legal and financial problems. The incubator, which still hinges on additional government support, would expand the inventory of commercial lab space in the city and provide the city with a biotech facility with rents as low as those found in suburban research parks.

- The New York City Partnership has proposed a major commercial biotech research complex in lower Manhattan, a plan that has the support of every medical research institution in the city. John Whitehead, the chair of the Lower Manhattan Development Corporation, has already expressed support for this project. And because it would involve the conversion of existing buildings, rather than new construction, it could be done relatively quickly.

- Columbia, which developed the city's only biotech incubator in the early 1990s, is proposing to build another commercial biotech facility in Northern Manhattan. Its first incubator, the Audubon Biomedical Science and Technology Park, has been fully occupied since shortly after opening its doors in 1995.

- The Memorial Sloan-Kettering Cancer Center, Rockefeller University and Cornell Medical School have proposed a major commercial biotech research facility at the Queens West development site in Long Island City.

- NYU wants to build a commercial biotech research facility on the site of the former Bellevue Hospital. The project has already gained approval from the City Planning Commission.

- The Albert Einstein College of Medicine has had a longstanding plan to develop a commercial biotech park across from its campus in the Bronx. (see "A Missed Opportunity" sidebar, page 9)

There are other signs that the city could be on the verge of a major growth spurt in the biotech sector. In his first months as mayor, Michael Bloomberg gave the keynote speech at the New York Biotechnology Association's annual meeting, an important signal of city support to the industry—and something that Mayor Giuliani never did. The New York City Partnership has made the development of a larger biotech industry one of its primary goals. In 2001, it issued a study demonstrating the industry's potential for growth in the city and this year it organized support for a biotech research park in lower Manhattan. Meanwhile, the Brooklyn Economic Development Corporation (BEDC) created on ongoing campaign—called the "Brooklyn Biotech Consortium"—that seeks to build on SUNY Downstate's plans for a biotech incubator and make Brooklyn a desirable locale for biotech R&D and manufacturing.

"Centers of Excellence" Announced by the Pataki Administration

City	High-tech specialty	State Funding Committed
Buffalo	Bio-informatics	$110 million
Syracuse	Environmental Systems	$37 million
Albany	Nanoelectronics	$50 million
Rochester	Photonics	$43 million
Long Island	Wireless Internet & Information Technology	$50 million
New York City	None	None

Source: Office of the Governor

A Missed Opportunity

In the early 1990s, New York City missed out on a golden opportunity to strengthen its biotech sector by developing a major commercial biotech complex in the Central Bronx. The indifference of successive gubernatorial administrations, coupled with foot-dragging by prospective tenants, allowed the project to slip away—and led to more homegrown biotech firms fleeing New York to other states.

The Bronx project had a lot going for it: the new facility was going to be retrofitted from a vacant psychiatric facility that was owned by the state; the site was already correctly zoned and located practically across the street from one of the nation's top biomedical research institutions; large anchor tenants had committed to the project; and the project was being pushed by several of the city's leading biomedical institutions as well as the borough's political leaders.

But largely because it never got the support it needed from state officials—either from Governor Mario Cuomo in the early 1990s or Governor Pataki during the past seven years—the facility was never built.

One major employer that had originally committed to being one of two anchor tenants in the Bronx project relocated out of New York earlier this year. The Public Health Research Institute (PHRI), a not-for-profit corporation that conducts research on infectious diseases, moved its operations to Newark this past March after being increasingly frustrated in its longtime search for larger facilities within the five boroughs. The institute had been based in Manhattan for 60 years, but after years of waiting in vain for New York State officials to get behind the Bronx development, it decided to move its more than 100 employees into a new, 50-acre science park that was erected with significant funds from the state of New Jersey.

The New York Biomedical Science Park, as the Bronx proposal was known, would have been a unique opportunity to bolster the city's biotech industry. The high cost of acquiring land and building new biotech facilities has always been a major obstacle to the industry's development in New York, but this proposal called for the re-use of 32 acres of state-owned hospital buildings in a campus setting that weren't being used. More than 300,000 square feet of space were immediately suitable for adaptive re-use, with potential to build out a total of 2 million square feet.

In addition, the location is ideal. Biotech parks usually work best when they are in close proximity to biomedical research institutions, and the site of this project is a stone's throw from the Albert Einstein College of Medicine, one of the nation's top recipients of NIH funding. It's also easily accessible to Westchester, New Jersey and Long Island, an important asset given that many scientists in the New York metro area live in the suburbs.

To be sure, the project's main advocate—Einstein—was unwilling to invest a sufficient amount of its own resources. More than one person involved in the project say that the institution was "looking for handouts" from government. But with stronger support from Albany—or even a clear signal that state funding was contingent upon investments in the project from Einstein—economic development experts believe the institution would have come to the table.

The proposal is still alive, but its chances of success were dealt a blow two years ago when the Pataki Administration sold off the property to a developer.

NYC: The State's Best Hope For Biotech

Upstate cities deserve a considerable share of the state's high-tech investment, not only because the struggling region needs a boost but because several upstate cities have the potential for significant growth in specialized technology fields. In fact, several upstate cities already have clusters of photonics, instrument, device, materials and chemical companies. And cities like Ithaca, Rochester, Albany and Buffalo are home to some of the state's most accomplished academic research centers. Nevertheless, if the state's goal is make New York one of the nation's leading centers for lab-based biotech, the most viable option is New York City and its suburbs.

The history of the biotech field suggests that it would be a mistake to think that the biotech sector—at least, the traditional, lab-based form of the industry—will take hold in several different parts of the state, even with significant financial support from the state.

"Given that the biotech industry has only succeeded in a handful of regions around the country, it's unrealistic to think that New York State will be able to create a meaningful biotech industry in several different parts of the state," says Sloan-Kettering president and former NIH director Dr. Harold Varmus.

The reason why is that biotech clusters don't start from scratch, but rather emerge out of existing economic assets: strong medical research institutions, a large pool of scientists and access to private sector financing. Companies in the industry—from emerging start-ups to established firms—have been repeatedly drawn to locations where there is already an existing cluster of biotech firms, pharmaceutical companies and related biomedical enterprises.

In New York, a handful of cities currently have a few biotech firms and at least one academic medical research institution. But only the New York City metropolitan area currently has the critical mass of biotech companies, scientists, biomedical research institutions and access to private sector capital that could eventually develop into a large, self-sustaining biotech cluster.

It's certainly possible for the life sciences industry to eventually take root in an upstate city like Buffalo or Rochester, both of which have some of the needed attributes to cultivate biotech activity. But any quick glance at the geographic distribution patterns of the biotech industry suggests that no more than one or two regions in the state will be able to succeed in developing a large enough biotech industry to make a difference economically. And given the industry's recipe for success in other parts of the country, there's no doubt that the New York City metropolitan area—including Long Island and Westchester—is the state's best chance for becoming a biotech hot spot.

The nation's biotech sector is tightly concentrated in a handful of metropolitan areas. A report released in June by the Brookings Institution Center on Urban and Metropolitan Policy found that nine metropolitan areas in the U.S. account for three-fourths of the nation's largest biotech firms and three-fourths of the biotech firms formed in the past decade.

For instance, in California, the nation's leading state for biotech activity, companies in the industry are primarily clustered around the San Francisco Bay Area and San Diego. The same goes for other states that have a large number of biotech firms: in Massachusetts, the industry is largely centered around the Boston/Cambridge area; in Maryland, most of the state's biotech firms are concentrated along the I-270 corridor near the National Institutes for Health in Bethesda; and in North Carolina, the majority of biotech firms are clustered in the Research Triangle, a region built up around the University of North Carolina and Duke University.

According to the Brookings study, the New York City metropolitan area is one of the nine metro areas in the U.S. that qualify as "biotechnology centers". Two other metropolitan regions in the state—Buffalo and

Rochester—were among 42 other major areas with some biotech activity. But the nine biotech "centers" have eight times as much research activity, about ten times as many large and newly established biotech firms and about 30 times more venture capital funding than each of the other 42 metro areas.

"There are enormous business advantages to being in a cluster," said Joseph Cortight, a professor at Portland State University and the co-author of the Brookings report. "Talented and entrepreneurial scientists are drawn to places where the industry is established. Once you get a pool of those people together, it's a decisive advantage to creating firms and growing the industry."

All of this gives existing biotech hubs, and places with the greatest amount of biomedical research activity, an enormous advantage over cities that want to cultivate a biotech cluster from scratch.

The New York City metropolitan area is also the only region in the state with an abundant supply of specially trained research scientists and technicians, one of the keys to getting growing biotech companies to locate in an area. The New York City metro area granted the most life science PhDs (519) of any place in the nation in 1999, the most recent year for which figures are available. In contrast, Rochester granted 51 life sciences PhDs and Buffalo granted 45.

Recommendations

New York City may finally be on the verge of taking its biotechnology sector to the next level, an appealing prospect given that biotech is projected to be one of the nation's fastest growing industries over the next few decades and that a larger biotech sector would help diversify a city economy that remains overly dependent on Wall Street. But it's unlikely that this will happen unless state and city officials take the following steps:

1. The State's Biotech Investment Strategy Must Include New York City

Governor Pataki and the Legislature must realize that any sound plan to bolster the state's biotech sector cannot exclude New York City. Moreover, the state's 2002 high-tech development strategy should include funds for at least one of the several commercial biotech development projects now being proposed in the city. State officials should give priority to projects put forth by institutions that commit to putting up significant resources of their own and projects that could move forward quickly.

2. Leverage State Support to Greater Cooperation Among Research Institutions

The state should leverage its biotech investment to specific economic outcomes, such as requiring competing city institutions to take steps to work together in a meaningful and substantive way; getting city institutions to collaborate with institutions in Westchester and Long Island; and getting institutions to become more engaged with the biotech industry. State support should do more than simply invest in new infrastructure; it must help create a better environment to support the growth of a commercial biotech industry. The state would be in a better position to guarantee these outcomes if its capital expenditures were accompanied by an ongoing biotech development plan for the state overseen by the New York State Office of Science, Technology and Academic Research (NYSTAR).

3. City Officials Must Get Behind Biotech

The Bloomberg Administration should work closely with the biotech industry to develop its own comprehensive biotech development strategy for the city. Meanwhile, the administration and the City Council should aggressively lobby its allies in Albany for state funds to support crucial biotech projects in the five boroughs.

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