



Life Science Initiative

ANNUAL REPORT: 2020



Empire State
Development

Introduction

In 2017, the Life Science Initiative took its first steps in laying the foundation for a thriving commercial life science ecosystem in New York State. Since its first annual report in 2018, initial programs have advanced and additional programs have been launched. By expanding the breadth and reach of the Life Science Initiative, these programs target many of the critical gaps in the state's ecosystem.

In the short period since inception of the initiative, we have already seen economic benefits from New York State's investment in the life science industry. Across all funded projects, the Life Science Initiative has created more than 350 jobs and enabled startups created or supported by organizations funded by the Life Science Initiative to raise more than \$108 million in matching funding. Additional investments of \$115 million committed directly to ESD grantees have been made by private companies and investors. These economic gains are only a small fraction of the anticipated economic benefits expected to result from the Life Science Initiative program portfolio over the next several years.

The myriad and complex challenges posed by the COVID-19 pandemic make clear that the life science industry plays a more vital role than ever, not only in curing disease but also in addressing urgent public health needs and in driving the economy. When it became clear that COVID-19 would have global impact, we looked at the role the New York State Life Science Initiative could play in addressing the pandemic. We recognized immediately that several grantees were supporting projects focused on managing infectious pathogens, which also would include coronavirus. We also were able to supercharge our investments by encouraging cross-pollination of funded projects, and connecting them with other organizations, to facilitate their advancement. This report includes information about how select ESD life science grantees are contributing to the effort to understand and manage COVID-19. As additional projects are brought on board, we anticipate a growing web of connections that will continue to foster innovation and growth.

A primary goal of the Life Science Initiative is to fast track the commercialization of New York State's unparalleled academic research assets and unlock an untapped pipeline of innovation – while ensuring that homegrown startups remain and grow in New York. To date, we have made significant progress toward this goal. In 2013, for every dollar of NIH grant funding, New York State received just \$0.06 in venture capital invested in life science companies. This was compared to \$1.27 and \$1.32 of venture funding per NIH dollar in Massachusetts and in California, respectively. This ratio increased fivefold by 2016, when New York saw \$0.30 cents in venture investment in life science companies for every dollar of NIH grant funding. And in 2020, New

York received \$.73 in venture capital for every dollar of NIH funding, a clear indication that private investors are viewing New York as an increasingly attractive center for emerging life science companies. As the life science industry continues to expand in New York, investment is expected to grow and approach that seen in California and Massachusetts, states that have been investing heavily in life sciences for many years.

A key focus of the Life Science Initiative is to attract, grow and retain life science companies in regions of the state with clusters of existing life science activity. The co-location of firms in a similar industry generates network effects by allowing such firms to benefit from their proximity to each other's assets, activities, and talent. By seeding New York's already budding industry clusters, the Initiative is investing in a thriving, connected life science ecosystem statewide. In this way, New York regions will be supported to build life science capacity locally, collaborate regionally and connect globally.

The following pages report on the operations and accomplishments of New York State's Life Science Initiative during 2020.ⁱ The report provides background on the Initiative and reports on the commitments to date of the \$520 million in planned investment. The report also highlights a number of exciting life science projects that have already been initiated and lists other information with respect to the operations and accomplishments of the Initiative.ⁱⁱ

New York State Life Science Initiative Resources

\$320M

Programs, Grants and
Project Funding

**Strategic initiatives to
grow New York State's
life science economy**

\$100M

Research and
Development Tax
Credits

**Refundable tax credits
for R&D expenditures,
available for new life
science companiesⁱⁱⁱ**

\$100M

Excelsior Jobs
Program Tax Credits

**Tax credits for job
creation initiatives^{iv}**

\$100M+

Private Investment

**Matching funds
expected from
industry partners for
public-private
partnerships**

Overview

Since its April 2017 legislative authorization, the Life Science Initiative has made active grant commitments totaling \$130.8 million^v in state funding for 8 distinct projects, which together are expected to leverage \$108 million in matching co-investment over five years. These projects and their awards from the Life Science Initiative include:

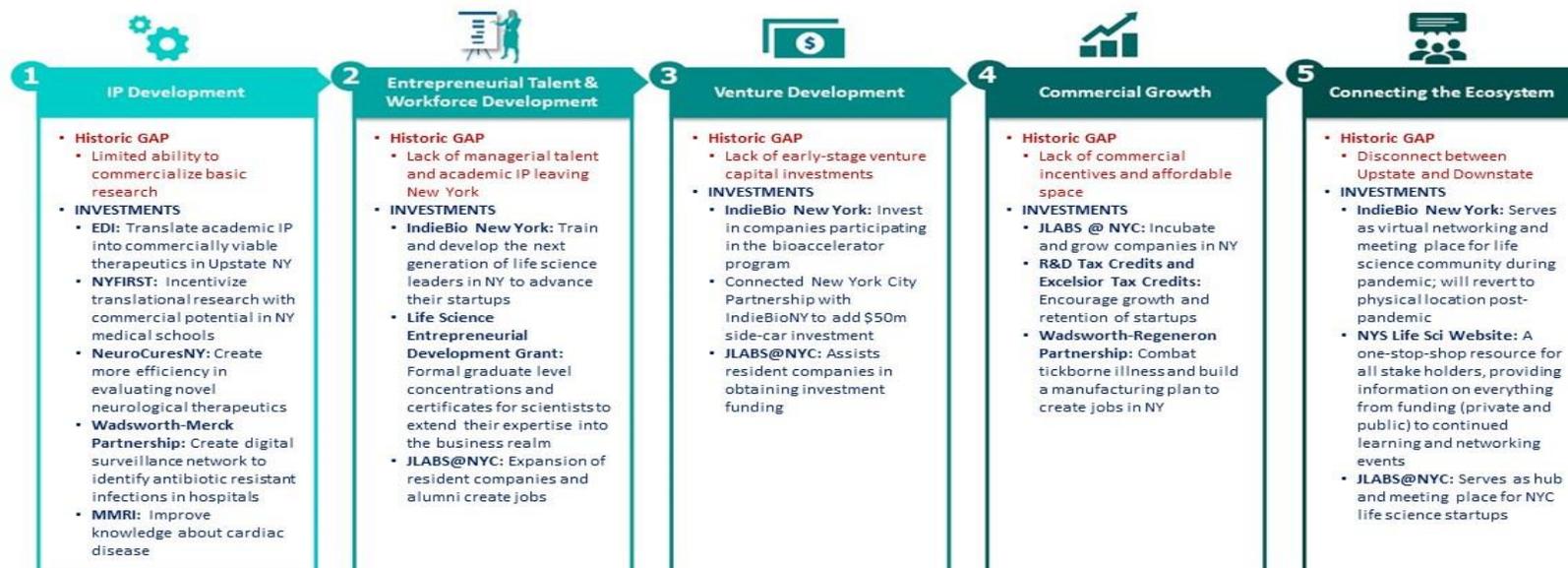
- The Empire Discovery Institute (\$37.05 million);
- The JLABS @ NYC incubator construction at the New York Genome Center (\$17 million);
- The New York Fund for Innovation in Research and Scientific Talent (NYFIRST) (\$15 million);
- Public-private partnership between the Wadsworth Center and ILÚM Health Solutions, focused on preventing antibiotic-resistant infections (\$22.4 million);
- The Regeneron Pharmaceuticals Manufacturing Expansion Project (\$10 million)^{vi};
- The NeuroCuresNY clinical trials network (\$5.5 million);
- IndieBio New York Bioaccelerator Program (\$25 million);
- The New York Life Science Entrepreneur Development Grant Program, Stages 1 and 2 (\$2.85 million); and
- The Masonic Medical Research Institute renovation (\$6 million).

To achieve its mission of growing and retaining startups in New York, ESD is implementing a multipronged approach to life science cluster development. This approach is aligned with the way in which life science industry clusters establish and thrive. Thus far, the Initiative has made investments that:

- leverage existing life science intellectual property from New York academic institutions;
- enhance and train talent;
- support entrepreneurs;
- attract private venture capital funding;
- build infrastructure; and
- provide incentives for economic growth.

Strategic Approach

ESD's strategic approach is to implement programs that fill historic gaps in New York's life science ecosystem.



Life Science Projects, 2020

Creating a Home for New York Startups: **IndieBio New York -- New York's Bioaccelerator**

In May 2019, ESD issued an RFP to engage a firm to administer a bioaccelerator in New York that would equip scientists with the skills and resources to become entrepreneurs and found life science companies and help ensure that startups have access to the resources needed to support long-term growth in New York. ESD selected SOSV, founder of IndieBio, the world's leading bioaccelerator in San Francisco, to establish and run IndieBio New York. IndieBio New York opened its doors early in 2020.

From a total pool of 807 applicants, IndieBio New York selected its first cohort of nine startup companies, three of which were New York-based companies. When it became clear that developing diagnostics, therapeutics and other measures against COVID-19 was critical, IndieBio New York put out a special call for applicants with technologies to address the virus. Of 169 applicants that resulted from this call, Halomine, which has developed a coating that keeps surfaces free of bacteria and viruses by extending the life of chlorine-based disinfectants, was selected for inclusion in the cohort.

The nine companies in the cohort started an intensive four-month boot camp on May 4, 2020. Because the COVID-19 pandemic continued to escalate, IndieBio New York effectively switched gears to provide remote access to its educational curriculum, global mentor network, and venture capital network. In addition to supporting each founder with as much as \$250,000 over the course of the boot camp, IndieBio is in the final stages of raising a \$50 million sidecar fund that will provide additional funding for select companies that have graduated from each IndieBio cohort and have plans to operate in New York. In addition, investment from a \$10 million fund raised by the Genesis Consortium will be offered to all qualified startups graduating the IndieBio programs in New York and San Francisco in 2021.

IndieBio New York was quite successful in advancing this cohort of companies and helping them build a viable business model by the time their formal training program ended on September 18, 2020 and culminated in a successful Demo Day held remotely just a few weeks thereafter. The Demo Day was attended by 859 members of the life science community, including 306 investors.

As of March 2021, IndieBio New York facilitated investment of \$10.3 million in its first New York cohort of startup companies since May 2020.

New York also is benefitting from participants in IndieBio's west coast program. A San Francisco IndieBio alumnus has expanded to New York as a direct result of efforts by IndieBio NY and is now playing a critical role in supporting viral testing capabilities in New York City and New York State. ESD life science staff connected that company, renegade.bio, with the New York Genome Center, another ESD-funded center, to hit the ground running in a New York State certified clinical laboratory in this crucial effort to expand COVID-19 testing. In addition to attracting the company to New York and playing an important role in the pandemic, the work being done by renegade.bio is providing the Genome Center with an additional revenue source.

Applications for the second IndieBio New York cohort are currently under review. This cohort is scheduled to begin early in 2021 and will locate in IndieBio New York's laboratory space in New York City. Starting in 2021 and continuing for a total of five years, two cohorts per year will undergo IndieBio New York's intensive training and receive guidance from a global mentor network, as well as access to venture capital funding. ESD expects that IndieBio New York will also act as a hub and a magnet for New York's growing life science industry, generating network effects and connecting stakeholders statewide.

Converting Basic Research into Commercial Opportunity: Empire Discovery Institute

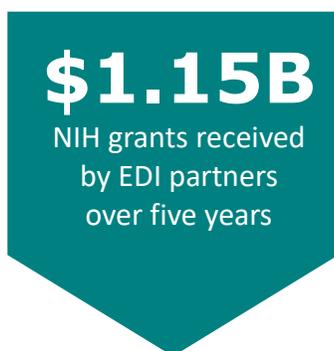
Approved by ESD in May 2018, the Empire Discovery Institute (EDI) is a groundbreaking organization created to fast track translation of the basic life science research conducted by its three founding partner institutions into a robust pipeline of clinically relevant and commercially viable therapeutics. By harnessing the expertise of the pharmaceutical industry and academia, EDI identifies and invests in promising discovery research candidates most likely to be commercially viable, ultimately creating new companies that will support life science clusters in Western New York and the Finger Lakes.

The University at Buffalo, University of Rochester and Roswell Park Comprehensive Cancer Center partnered to form EDI as a 501(c)(3) non-profit to capitalize on the wealth of their early stage research and to expedite its progress toward commercial viability. These institutions possess an enormous repository of untapped research assets, many of which are ripe for commercialization. ESD's investment of \$37.05 million to establish EDI and support five years of

operations enables EDI to more rapidly tap into more than \$1.15 billion of NIH-funding received by the three partner institutions over the past five years.^{vii}

EDI opened its application portal for scientists from the partner institutions in October 2019 to compete for its Medicines Discovery Award Program, given to the most promising early-stage research programs with the greatest potential for commercial viability. In early 2020, EDI selected five research programs as their first award recipients.

EDI's efforts to obtain investment in its research programs are paying off. Just recently, EDI executed a \$65 million investment collaboration with Deerfield Management that will further catalyze life science industry growth in NY. EDI also is in late-stage negotiations with pharmaceutical companies about investment in research programs under its aegis.



Developing Entrepreneurial Talent: Life Science Entrepreneur Development Grant Program

A key goal of the Life Science Initiative is to attract venture capital investments in NY-based life science companies; yet a lack of entrepreneurial talent has been cited as a significant impediment to this goal. While the solution is multi-pronged, the Life Science Initiative has begun to address the earliest stages of this issue with the opportunity to train and educate scientists with business degrees and programs: the creation of specialized MBA and certificate graduate programs in life science entrepreneurship.

In August 2019, the Life Science Initiative released a competitive grant solicitation to business schools to work in collaboration with a medical school or a graduate program in the life sciences, bioengineering or bioinformatics to create MBA or certificate programs that develop life science entrepreneurial talent. These interdisciplinary programs will help life science researchers extend their expertise into the business realm and will equip them to become business leaders in New York State's growing life science ecosystem.

The grant solicitation elicited an exceptional response:

- Eighteen applications were submitted from business schools across the state by the October 15, 2019 deadline.
- Seven applications were accepted to receive Stage 1 planning grants of \$50,000 each, which called for development and submission of a detailed and comprehensive curriculum, implementation plan and budget from each planning grant recipient.
- The seven plans submitted are under review and consideration to receive Stage 2 implementation grants of up to \$500,000 each.

An Incubator for Innovation: JLABS @ NYC

To foster idea generation and breakthrough innovations in the life science industry, ESD awarded capital funding of \$17 million to support the launch of JLABS @ NYC, a collaboration between Johnson & Johnson Innovation and the New York Genome Center. ESD’s funding supported the renovation of 30,000 square feet of space at the New York Genome Center with wet and dry laboratory equipment and facilities. Johnson & Johnson Innovation’s JLABS @ NYC is operating the new lab facility as an incubator for life science companies.

JLABS is not only contributing to the expansion of New York’s life science cluster, but several of its companies and alumni also are conducting research relevant to COVID-19. This work includes novel ways to rapidly detect and diagnose infection by pathogens, therapeutics for pandemic viral infections and more common respiratory viruses and overcoming the problem of antiviral drug resistance. JLABS also houses Blue Knight,TM, a collaboration with the Biomedical Advanced Research and Development Authority (BARDA), which is focused on supporting companies with innovative solutions for public health threats and emerging diseases.

JLABS @ NYC opened in June 2018 and has been enormously successful in expanding the life science ecosystem in New York State. And, in growing the New York City life science cluster, JLABS@NYC has not only created jobs, but also the much talked about “industry buzz” so important for attracting other companies. Since JLABS opening in 2018 and through 2019, JLABS companies have already created 267 new jobs and have collectively raised more than \$909 million in investment funding.



Tackling Brain Disability by Enabling More Efficient, Less Costly Clinical Trials: NeuroCuresNY

A rapidly growing epidemic is that of physical and cognitive disability due to brain diseases, including stroke, traumatic brain injury, Parkinson's disease, and Alzheimer's disease. With the aging population, current estimates are that by 2050, stroke and Alzheimer's disease alone will cost 1.4 trillion dollars in health care costs and lost productivity in the United States. Identifying a strategy to change this trajectory will bring enormous economic opportunity. NeuroCuresNY is a catalyst to help realize this opportunity.

NeuroCuresNY (NCNY) is a not-for-profit initiative formed by Burke Neurological Institute, the University of Rochester and the National Center for Adaptive Neurotechnologies (formerly at the Wadsworth Center). NCNY is creating a unique clinical trial network and process for testing drugs to treat chronic neurological impairment and disability, an area of research often overlooked because of the difficulty and cost of conducting trials. NCNY's unique platform is designed to reduce infrastructure costs for each trial and enable trials to run more efficiently, with the goal that more therapeutic modalities will be evaluated more efficiently.

To date, NCNY has conducted much of the legwork needed to identify best practices in patient recruitment, protocol development, organizational structures that can effectively implement the demonstration trial, and has evaluated interest from pharmaceutical companies with an appropriate neurological therapy in phase 2 development. NCNY is now in the final stage of selecting a pharmaceutical sponsor and will finalize protocol development once a sponsor is chosen.

It is anticipated that NCNY's cost-efficient platform will interest companies eager to test their therapies more rapidly and more efficiently. This will help to commercialize research and intellectual property resident in the state's academic institutions, strengthen relationships with potential sponsors of future trials for the network, and attract companies to the state.

Advancing Public-Private Partnerships in the Life Science Sector: ILÚM-Wadsworth Partnership: Identifying Antibiotic-Resistant Infections

In a boon to the Life Science Initiative, Governor Cuomo has committed \$750 million in separate funding to rebuild the Wadsworth Center. As one of the oldest and largest state public health laboratories in the nation, the Wadsworth Center Laboratory has accumulated unique capabilities and expertise that can attract and support innovative commercial partnerships and

private investment. The anticipated construction of a state-of-the-art lab built for the 21st century is attracting public-private partnerships to grow the state’s life science ecosystem. The Wadsworth Center will serve as a flagship project and commercial magnet for New York State, with ongoing potential to create new jobs and revenue.

- ESD has secured ILÚM Health Solutions, a former subsidiary of Merck and Co., to partner with the Wadsworth Center on a mission made even more urgent by the spread of COVID-19: development and implementation of an infectious disease surveillance network to quickly identify and contain dangerous pathogens. This partnership has relocated ILÚM from New Jersey to the Capital Region to leverage New York State’s unique public health research assets and bringing new commercial life science activity to the Capital Region while supporting the lab’s crucial public health mission.

ILÚM is now in its second year of piloting a software solution, currently at several hospitals in the NYU Langone and Northwell Health hospital systems, that connects these hospitals to the Wadsworth Lab. This network will be rolled out to hospitals and health systems across the state after successful completion of the pilot.

- This network’s arrival couldn’t be more timely, as it offers the unforeseen advantage of detecting SARS-CoV-2, the virus causing COVID-19, giving the state a big advantage in infectious disease detection. The network has already proved beneficial by detecting the movement of a COVID-19-positive patient from NYU to Northwell in time to alert both medical centers.

ILÚM will act as an anchor institution for other firms, generating labor mobility in the region and facilitating cluster growth. ILÚM has already created 14 new jobs.



Masonic Medical Research Institute

Masonic Medical Research Institute (MMRI) is an internationally recognized biomedical research institute focused on unraveling the mechanisms underpinning the cause of cardiac disease. The Life Science Initiative awarded a \$6 million capital grant to MMRI to support Phase II of the facility's renovation. The project entails reconstruction and retrofitting of 5,500 square feet of recently demolished basement space into a modernized laboratory space to allow for the recruitment of up to five new faculty members.

- MMRI will finance \$9 million of the project
- The total project cost is \$15 million
- The project will create 25 new jobs

Enhancing Translational Research Strength: New York Fund for Innovation in Research and Scientific Talent (NYFIRST)

A \$15 million competitive grant program for medical schools in New York State, NYFIRST encourages the recruitment or retention of exceptional translational life science researchers by supporting the establishment or upgrading of their laboratories and by providing working capital. Medical schools may receive awards of up to \$1 million and are required to provide a match of 2:1 for each grant.

To date, ESD has awarded NYFIRST grants of up to \$1.0 million each to:

- Columbia University School of Medicine (two awards: 2018 and 2019);
- Icahn School of Medicine at Mount Sinai (two awards: 2018 and 2019)
- SUNY Upstate Medical University (2019)
- University of Rochester (two awards: 2018 and 2019)

As COVID-19 halted the ability of most medical schools to recruit researchers due to budgetary concerns, only two applications, now under review, were submitted during the most recent application cycle. Eligibility requirements, program guidelines and information about the opening of an application cycle are available on the ESD website: <https://esd.ny.gov/ny-first-program>.

\$1M
In grant support
available per award

2:1
Match from
medical schools

Investing in Good Manufacturing Practices: Regeneron Manufacturing Expansion

As further sign of the growth of the life science industry, in September 2018 the Governor announced that Regeneron would also undertake a major expansion in the state, investing approximately \$800 million over seven years to upgrade its corporate and manufacturing facilities and grow its existing in-state employment of 5,400 by creating an additional 1,500 new full-time jobs at its Rensselaer County campus.

To encourage Regeneron's expansion in New York State, ESD offered the company up to \$140 million in performance-based incentives, \$10 million of which was to be funded out of the Life Science Initiative. In November of 2020, this funding commitment was transferred to New York Works EDF 17-18.

Moving Forward

By listening to the state's life science community and understanding its needs, the New York State Life Science Initiative is building a strong foundation for retaining and nurturing homegrown life science companies, while also attracting new startups to the state. The \$130.8 million in total investments currently committed are specifically designed to address the long-identified gaps and opportunities in the state's life science ecosystem.

Other industries are recognizing the value that can be created by the life science industry in New York State and are nurturing the environment even further. Real estate development specifically designed for life science startups, expanded legal and intellectual property practices, and growth of investments in New York-based life science companies all speak to the traction of the life science industry in the state. This momentum will encourage continued expansion of the service and support industries required by life science companies, thus creating an even more robust ecosystem that facilitates cross-pollination between industries.

Summary of Life Science Initiative Operations

September 2018 – September 2020

Dedicated Life Science Initiative Funding				
Funding Source	Appropriated	Committed	Disbursed	Remaining
Grants, Project Funding and Program Costs	\$320,000,000	\$130,800,000	\$30,736,999	\$289,263,001

Other State Life Science Incentives				
Incentive	Total Available	Status	Credits Allocated	Description
Excelsior Jobs Program	\$100,000,000	Life science industry allocation implemented in April of 2017. Currently accepting rolling application submissions.	From inception to date, seven companies have received awards, totaling \$4.92 million in credits. These companies are anticipated to create 287 net new jobs.	Information about the program, regulations, eligibility and how to apply can be found at: https://esd.ny.gov/excelsior-jobs-program
Life Sciences R&D Tax Credit Program	\$100,000,000 (capped at \$10,000,000 per year)	Applications accepted on a rolling basis as long as funds are available.	From inception to date, tax credits totaling \$2.67 million have been issued to 11 applicants with total qualified expenses of \$23.07 million.	Information about the program, regulations, eligibility and how to apply and an application can be found at: https://esd.ny.gov/life-science-tax-credit-program
Total	\$200,000,000			

Active Life Science Project Commitments			
Project	Total Project Cost	Life Science Initiative Funding Commitment	Disbursed
Empire Discovery Institute (EDI)*	\$ 47,400,000	\$ 35,400,000	\$ 2,000,000
*EDI garnered an additional investment of \$65 million from Deerfield Management for a five-year collaborative research investment agreement.			
University of Rochester (EDI Planning Grant)	\$ 1,650,000	\$ 1,650,000	\$ 1,650,000
NYFIRST	\$ 45,000,000	\$ 15,000,000	\$ 0
JLABS @ NYC	\$ 17,000,000	\$ 17,000,000	\$17,000,000
ILÚM/Merck-Wadsworth Partnership	\$ 59,883,000	\$ 22,400,000	\$ 3,086,999
Masonic Medical Research Institute	\$ 15,000,000	\$ 6,000,000	\$ 0
Burke Neurological Institute (NeuroCuresNY Planning Grant)	\$ 795,000	\$ 500,000	\$ 500,000
NeuroCuresNY Working Capital	\$ 9,581,732	\$ 5,000,000	\$ 1,500,000
SOSV Bio-Accelerator Program**	\$ 35,100,000	\$ 25,000,000	\$ 5,000,000
** In addition to providing up to \$250,000 to each company in a cohort, IndieBio is raising a \$50 million fund to be used for the benefit of companies that have graduated from IndieBio and have plans to operate in New York. Investment from a \$10 million fund raised by the Genesis Consortium also will be offered to all qualified startups graduating the IndieBio programs in New York and San Francisco in 2021.			
Life Science Entrepreneur Development Grant Stage I	\$ 350,000	\$ 350,000	\$ 0
Life Science Entrepreneur Development Grant Stage II	\$7,500,000	\$2,500,000	\$ 0
Total	\$239,259,732	\$130,800,000	\$30,736,999

Endnotes

ⁱ This annual report has been prepared in accordance with the statutory requirements of Section 16-aa (5) of the New York State Urban Development Corporation Act (Chapter 174 of the Laws of 1968, as amended). Of note, for some categories of information, such as economic impacts and federal funding awards, limited data were available for the reporting period due to a lag in available data and the early stages of many initiatives. Additional information on these topics will be provided in subsequent annual reports.

ⁱⁱ The report does not detail all life science activities under way in the state, nor does it articulate every asset, incentive or benefit available to a life science company operating in New York State.

ⁱⁱⁱ Information about the program, regulations, eligibility, how to apply and an application can be found at: <https://esd.ny.gov/life-science-tax-credit-program>

^{iv} Information about the program, regulations, eligibility and how to apply can be found at: <https://esd.ny.gov/excelsior-jobs-program>

^v Two Regeneron projects originally included as commitments within the Life Science Division were ultimately removed from the Life Science budget: A \$10 million funding commitment towards a Regeneron manufacturing project with a total cost of \$800 million was transferred to New York Works EDF 17-18 in November 2020; Additionally, Regeneron opted not to pursue a partnership with Wadsworth to identify new diagnostics and therapeutics for Lyme disease, thus further decreasing Life Science commitments by \$30 million.

^{vi} Funding for this project was ultimately transferred to New York Works EDF 17-18, resulting in a corresponding reduction in the overall Life Science funding commitment.

^{vii} “NIH Awards by Location and Organization” – NIH Research Portfolio Online Reporting Tools (Accessed 2018). <https://report.nih.gov/award/index.cfm#tab2>