

Testimony of:

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and

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Good morning, Chairs Weinstein and Krueger, Chairs Ryan and Bronson and other distinguished members of the New York State Legislature. Thank you for this opportunity to testify on the Executive proposed budget for the State fiscal year 2023-2024.

My name is Ross Frommer, Vice President for Government & Community Affairs and Associate Dean at Columbia University Irving Medical Center (CUIMC). Proudly located in Washington Heights, CUIMC is the health and biomedical sciences campus of Columbia University, consisting of the Vagelos College of Physicians & Surgeons (VP&S), our medical school, the School of Nursing, the Mailman School of Public Health, and the College of Dental Medicine. We are a member of the Associated Medical Schools of New York (AMSNY), on whose behalf I am also speaking. AMSNY represents the interests of New York's seventeen medical schools.

I am here today to speak in support of the New York Fund for Innovation in Research and Scientific Talent Program, or NYFIRST, as it is commonly referred. NYFIRST is an economic development initiative run by Empire State Development (ESD) which provides funds to the medical schools across New York State to recruit and retain top scientific talent.

AMSNY requests that the Legislature and the Governor renew the NYFIRST program with an additional \$25 million allocation, whether by a new appropriation, our preferred option, or dedication of funds from the Life Sciences Initiative.

Background

Biomedical research, and the intellectual property it generates, can result in significant licensing deals with the biopharmaceutical sector and the launch of start-up companies, thus making it an important economic driver. The backbone of basic biomedical research is National Institutes of Health (NIH) funding, which supports research into the causes of, and treatments for, a wide range of diseases, including cancer, diabetes, neurodegenerative disorders like Alzheimer's and Parkinson's diseases, cardiovascular disease, and many more that both impair quality of life and cause significant economic burden. According to a 2018 U.S. Chamber of Commerce analysis, disease burden in the U.S. results in an annual 9.4 percent reduction in gross domestic product.

New York State is perennially the third-largest recipient of NIH funding, with \$3.4 billion awarded to New York academic institutions and private sector companies in 2022. Of that total, 68% was awarded to scientists at New York's 17 medical schools. These funds support research laboratories that effectively function as small businesses, and sometimes not so small businesses, within the medical schools, with a Principal Investigator at its head and

typically eight to ten post-doctoral scientists, technicians, and support staff. These small enterprises can grow significantly as the research advances, developing new technologies, intellectual property, launching start-ups, and educating, training, and developing the scientific workforce of all ranks and roles.

However, New York State's investment in its life sciences sector has not kept pace with other states. As a result, those states making significant investments have more advanced start-up ecosystems and competitive advantages in recruiting and retaining world-class scientific talent.

Texas research institutions drew upon an initial \$3 billion investment in the Cancer Prevention Research Initiative of Texas (CPRIT) in 2007 to recruit out-of-state scientists, spending more than \$40 million in the first several years to recruit important researchers, many from New York State research institutions. One of those recruits, the immunotherapy scientist James Allison, was lured from Memorial Sloan Kettering Cancer Center to MD Anderson Cancer Center in Houston with a \$10 million package. Dr. Allison subsequently went on to win the prestigious Lasker Prize and a Nobel Prize in 2018. More importantly, Dr. Allison's research in immunotherapy has proven remarkably effective in fighting advanced cancers and has the potential to contribute significantly to next-generation cancer treatments. So, it is unsurprising that, building on this successful program, Texas voters authorized a second \$3 billion investment in CPRIT in November 2019.

California, recognizing the economic benefits of investing in bioscience, launched its \$3 billion California Institute for Regenerative Medicine (CIRM) in 2004. An additional \$5.5 billion was approved by voters through a referendum in November 2020. CIRM is focusing translational research – research that advances basic science from “bench to bedside” and towards the marketplace. California has long supported its life sciences industry, providing seed and other funding to startup companies launching from its academic institutions. As a result, California has the most robust life sciences sector in the U.S., with more than 14,000 life sciences companies employing nearly 335,000 people in 2021 and \$79 billion in venture capital (VC) investment from 2018-21 (compared to 5,314 life sciences companies employing 110,000 people in New York State in 2021 and \$18.4 billion in VC investment from 2018-21).

Many other states have followed similar paths: Massachusetts created its \$1.5 billion Massachusetts Life Sciences Center to drive basic research and grow its bioscience sector; Connecticut invested \$2.5 billion to expand its research ecosystem. Even states with relatively few major academic research institutions have made outsized investments that, on a per capita basis, are competitive with Texas, California, and Massachusetts.

New York Fund for Innovation in Research & Scientific Talent (NYFIRST)

New York State's initial investment of \$20 million in the NYFIRST program was a central part of its Life Sciences Initiative in 2017. It signaled the State's commitment to an increasingly important part of New York State's innovation economy. The NYFIRST program has already improved New York State's competitive position in recruiting and retaining world-class scientific talent, an essential component of the State's growing bioscience sector. But the vital work of strengthening New York's life sciences workforce has just begun; the State must continue to ensure our academic institutions and private sector have the scientific talent to drive discoveries, technological innovation, entrepreneurship, product development, and new company formation.

Return on Investment

NYFIRST leverages additional investments from academic institutions through a required 2:1 match. In the first three cycles of NYFIRST funding, the medical schools have significantly exceeded the required match, with an estimated \$3.72 in additional activity generated for each State dollar invested.

Employment

NYFIRST is a proven driver of life sciences employment. These are high-wage jobs (averaging \$74,058 per year, exceeding the statewide average private sector wage) at institutions with deep historical roots in New York State. Given their complex infrastructures and partnerships with other healthcare entities and local communities, academic medical centers are stable employers over the long term. They will continue to be an important component of the State's economy for the foreseeable future, meaning that, in contrast to other economic development initiatives, there is little risk that State investments in NYFIRST will flow out-of-state and fail to provide in-state jobs. With \$9 million allocated so far, NYFIRST awardees have created a total of 183 new jobs in just over four years.

NYFIRST Cycles 1-3

The first three cycles of NYFIRST funding have demonstrated the program's significant return on investment, rapid employment growth, and an additional \$3.72 in economic activity for every State dollar invested.

Employment Data

- Net new jobs (direct and indirect) created by NYFIRST recruitment in year 1: **101**

- Net new jobs (direct and indirect) created by NYFIRST recruitment in year 2: **68**
- Net new jobs (direct and indirect) created by NYFIRST recruitment in year 3: **14**
- Net new jobs (direct and indirect) created by NYFIRST recruitment in years 1-3: **183**
- Average salary of all jobs created by NYFIRST recruitment in years 1-3: **\$74,058**

Institutional Matching Funds

- Total institutional matching funds in years 1-3: **An estimated \$33.4 million**

Return on Investment

- Every dollar invested by New York State in NYFIRST results in an additional **\$3.72 in economic activity** through institutional capital investments and additional grant funding brought to New York State.

These numbers are no doubt impressive, but NYFIRST is young, and there is admittedly limited data. Fortunately, there is another New York State program that we can look to in order to gauge how effective NYFIRST will be in the long run, and you will see that the answer to that question is that the program will be very effective.

From roughly 2002 to 2014, NYSTAR, now part of ESD, ran the Faculty Development Program (FDP). Although not identical to NYFIRST, the concept behind FDP was the same – using state funds to help academic institutions across the State to recruit and retain top faculty, scientists who will bring in research funding, create new knowledge, obtain patents, foster economic development, and most importantly create jobs.

Over the course of the program, the FDP helped colleges and universities, upstate/downstate, SUNY, and private non-profit, recruit or retain fifty-two scientists. The total state investment was roughly \$39 million dollars. Those fifty-two recipients created over a quarter billion dollars in economic activity, over a six-to-one return on investment and thousands of jobs created or saved.

This dramatically underestimates the success of the FDP. The program ended in 2014, and the State stopped collecting data, so the numbers I just mentioned are from nine years ago. A few years ago, we looked at what happened to those fifty-two FDP recipients and found that

70% of them were still doing research in New York. These were five years grants, but even ten years after the grants were finished, FDP was still paying off.

NYFIRST will be the next FDP, and the State's relatively small investment will be repaid several times over for years.

NYFIRST at Columbia

I have spoken about what NYFIRST has meant and could mean for New York. Let me provide some examples from Columbia University that will further demonstrate this program's value.

Because of NYFIRST, we have been able to recruit two outstanding new faculty members to CUIMC, researchers who are not only producing great science that has the potential to benefit us all but also bringing in outside funding, creating jobs, generating economic activity, and attracting other scientists to New York. We also have one additional NYFIRST grant in the works, which has yet to be finalized, but about which we are very hopeful. Like many medical schools across New York, we recently submitted a round 4 application. If approved, thanks to NYFIRST, we will have recruited four new extremely talented, highly productive researchers to New York.

These recruited scientists have extensive research portfolios on diverse topics with clear potential for therapeutic impact. They also take advantage of cutting-edge methods for their research (super-resolution microscopy, specialized mass spectrometry, development of accurate preclinical models) and bring expertise in the use of the latest instrumentation and technologies.

The impact of these recruits is far beyond what is captured in the reported metrics. These recruits have assisted in the successful submission of shared equipment grants that further build out our research infrastructure. They have established and extended the work of collaborative research centers, bringing in millions of dollars from the NIH while attracting additional talent and enabling our local communities to participate in and benefit from national translational research programs. This new talent and research infrastructure will be further leveraged to bring additional federal and other funding to the State.

Our first NYFIRST recruit is Jordan Orange, MD, PhD, the Reuben S. Carpentier Professor of Pediatrics and Chair of the Department of Pediatrics at Columbia VP&S. Dr. Orange came to us from Texas. Over the last decade and a half, New York has lost so many top-notch researchers to Texas, so getting one back was gratifying. He is an international leader in pediatric primary immunodeficiency and the immunobiology of human natural killer cells. Dr.

Orange combines novel disease discovery with basic cell research to translate underlying biological mechanisms of disease into clinical applications. The NIH has continuously funded his research, and he has published over 350 papers. Just recently, Dr. Orange was elected to the National Academy of Medicine.

Since his recruitment, Dr. Orange has brought in over \$12 million in research funding and created thirty-three new jobs. He has also obtained one new patent and is currently working with our technology transfer expert on creating a start-up company based on his work.

Our second NYFIRST recruit is Simon John, PhD, the Robert L. Burch III Professor of Ophthalmic Sciences, who came to us from Maine. Dr. John uses novel tools and models to better understand and develop treatments for glaucoma and other eye diseases. Since coming to Columbia about three years ago, Dr. John has already generated \$6 million dollars in new funding, which has been used to, among other things, create fourteen new jobs.

So, combined, with just a \$2 million investment, in a relatively short period, the State has helped create almost fifty new good paying jobs, a number which will almost certainly go up as these researchers continue to bring in new grant money from the federal government, philanthropy, and venture capital funding.

A couple of notes about the jobs created. First, no State money goes to pay the primary investigator. New York State is not paying Dr. Orange's or Dr. John's salaries. All State funds are directed to lab operations and capital infrastructure. Second, in addition to competitive salaries, jobs at Columbia have very strong benefits as well – health care, retirement, education, etc., the kind of benefits that can allow working families to prosper and build strong communities. I cannot say for sure, but I believe something similar can be said about working for all the medical schools in New York.

As noted, we have two other NYFIRST research proposals in different stages in the application process. While I cannot provide details, should they receive a NYFIRST grant, their numbers will be no less impressive than Drs. Orange and John.

I spoke earlier about the FDP. Allow me to tell you about Rudolph Leibel, MD. Dr. Leibel is the Christopher J. Murphy Memorial Professor of Diabetes Research, Professor of Pediatrics and Medicine, and Co-Director of the Naomi Berrie Diabetes Center at CUIMC. He is an internationally recognized leading expert in diabetes and obesity and has devoted his career to finding ways to prevent and treat these debilitating diseases.

Dr. Leibel joined the Columbia faculty in 1997 and was successful in not only moving science forward but also bringing in grant, philanthropic, and private-sector support. In 2002, a well-known, well-respected out-of-state medical school with significant resources tried to recruit Dr. Leibel away from Columbia and New York. This other institution made Dr. Leibel an attractive offer, but ultimately, we convinced him to stay, primarily because we received an FDP grant.

The NYSTAR grant awarded approximately \$150,000 per year for five years, a total state investment of \$750,000. Dr. Leibel has generated \$54 million dollars in research support. The number is higher since it only includes grants since 2007, ten years after he arrived and five years after his state support ended. Today, Dr. Leibel is responsible for over 100 good paying jobs, not including general campus support jobs like maintenance, security, and animal care, which his lab indirectly supports.

So, in 2002, New York State invested three-quarters of a million dollars in Dr. Leibel. He used that money to hire additional staff and purchase equipment. A little over twenty years later, the return on that investment is 72 to 1 and counting. Using a back-of-the-envelope calculation, the New York State income tax revenue alone from Dr. Leibel and his employees is north of a quarter million dollars every year.

One of the other goals of programs like NYFIRST is to promote economic growth, and recipients must show a track record of technology transfer. Dr. Leibel has excelled in this area as well. Since receiving the FDP grant, he has filed twenty-one invention reports and over fifty patent applications worldwide. He has also been involved with six different licensing agreements and helped start two new companies.

Remember that the original grant was a retention grant designed to prevent Dr. Leibel from leaving New York. So, if not for the State investment, all of his work and the jobs and economic activity that come along with the grant, would be occurring elsewhere, not in New York.

Dr. Leibel may be the poster child for investing scientific talent and why the NYFIRST concept is such a good idea, but please note that there are other great examples from across the State. At Columbia, as much as twenty years later, four of the eight FDP awardees are still on faculty doing research in New York. Two others have retired and only two left the State. I submit that we want more scientists like Rudy Leibel coming to, not leaving New York,

The Future of NYFIRST

The fourth NYFIRST application cycle closed in January 2023, and we anticipate that this cycle will exhaust the original \$20 million appropriation. While these cycles of funding have

demonstrated the potential of NYFIRST to attract and retain scientific talent, it is also clear that the competition for scientists has not abated; indeed, this competition has expanded as governments, academic institutions, and companies around the world have recognized the value of the bioscience sector and the importance of the human capital that drives the sector's intellectual property creation and entrepreneurship.

NYFIRST has been particularly impactful in providing funding for medical schools to bring in new recruits from outside the State; New York medical schools cannot use the funds to recruit from one another. In the future, additional NYFIRST funds will help ensure that not only recruits come to New York but are productive and stay here. These individuals are in high demand and get very competitive offers to relocate. If we do not support them, they may never come, and some who are here may leave and take all of their funding and the jobs they support with them.

It may sound a bit crass, but let me be honest. This is an arms race. Other states are equipping their research institutions with the tools they need to recruit and retain the scientific rock stars. With NYFIRST, New York is helping our medical schools do so as well, but other states are doing so much more, and after round four, NYFIRST will most likely be out of money.

This would be a shame, especially now. In December the Congress and President Biden increased NIH funding by \$2.5 billion (5.5%). This is the sixth year in a row that the NIH budget has increased significantly, and while I cannot predict the future, I can tell you that supporting biomedical research is one of the few issues upon which just about everyone agree – Republican/Democrat, House/Senate, Executive. Where will this funding go? It will follow the talent. That funding will go to states that invest in research, so if New York does not, again, perhaps sounding a little crass, we will be leaving money on the table that states like California, Texas, Massachusetts, Florida, etc. will be all to happy scoop up.

We need to replenish NYFIRST. Without it, New York will continue to be at a disadvantage, and we will lose talent and the funding, and jobs accompanying it.

Closing

Thank you for the opportunity to testify today and for your continued support for biomedical research. I welcome any questions you may have. Respectfully submitted,

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