SENATE MAJORITY POLICY COMMITTEE

SENATOR DAN LAUGHLIN
CHAIR

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Public Hearing

PA as an Innovation Leader

Thursday, April 11, 2024
Montgomery County Community College
Room 202 North Hall Building
Pottstown Campus 101 College Drive
Pottstown, PA 19464
2:00 pm

AGENDA

2:00 Opening Remarks
Senator Dan Laughlin, Majority Policy Chair

Academic Research and Support
John Swartley, Chief Innovation Officer, University of Pennsylvania
Dr. Bretz, Dean of STEM, Montgomery County Community College
Aldo Romano, Chief Business Officer, Jefferson Institute of Bioprocessing

Nurture Start-Up Development
Scott Nissenbaum, President & CEO, Ben Franklin Technology Partners of Southeastern PA
Louis Kassa, President & CEO, PA Biotechnology Center
Al Gianchetti, President & CEO, XyloCor Therapeutics

Maintain and Expand Established Company Growth
Rick Taylor, Senior Director, Government Affairs, Adare Pharma Solutions
Dr. Carl Ascoli, Chief Scientific Officer, Rockland Immunochemicals
Scott Bentley, Executive Chairman, VideoRay
Anne Brooks, Senior VP of US Commercial, Iovance

3:50 Closing Remarks
Senator Dan Laughlin
Committee Members

Good afternoon Chair Laughlin and members of the Senate Majority Policy Committee. My name is John Swartley and I am the Chief Innovation Officer at the University of Pennsylvania where it has been my privilege to shape and lead technology development and translation efforts for the last 17 years. Thank you for providing me with the opportunity to participate in today's hearing on the critical role of innovation in Pennsylvania.

The United States has long been a global leader in innovation, a status underpinned by a robust ecosystem fueled in significant part by university-based research. This type of research is not solely an academic exercise; it is a critical component of the nation's economic engine, creating well-paid jobs, fostering an environment conducive to the establishment and growth of high-tech industries, and helping to maintaining our global competitiveness. In partnership with the private sector, university-led innovation efforts contribute directly to the development of new technologies, processes, start-up companies, and services that drive economic growth and advance societal progress. The commercialization of research outcomes, through technology transfer and the formation of start-up companies amplifies this impact, further contributing to regional economic diversification and resilience. This is certainly true in the state of Pennsylvania, where critical discoveries and advancements made by institutions like the University of Pennsylvania lead to significant impacts on both the local and state economies.

As one of the leading recipients of research grant funding in the world and the largest private employer in the city of Philadelphia, Penn's research initiatives have not only advanced knowledge but also fueled regional economic development. The university's commitment to fostering technology development and commercialization has made it a major economic driver. Here are just some of the ways in which Penn contributes to the economic vitality of Philadelphia and the broader Pennsylvania state economy:

Research and Innovation: Penn is a world-class center for research, scholarship, and innovation, supporting a translational research pipeline that has far-reaching economic implications, evidenced by the steady flow of discoveries, patented inventions, license agreements, and new companies constantly being spun out of Penn. Over the course of the last ten years alone, commercial translation of innovations made at Penn has resulted in the filing of over 8,000 patents and execution of nearly 7,000 commercialization agreements, including numerous multi-year, multi-million dollar partnerships with both established industrial players and well-funded Penn startups.

Employment: As the largest private employer in the City of Philadelphia, Penn plays a crucial role in job creation and sustains a substantial workforce, contributing to the economic stability and growth of the region. A particularly important and often overlooked contribution of academic research to the innovation economy is the development of human capital. Universities are not only centers of research but also hubs of education and training where the next generation of scientists, engineers, and entrepreneurs are equipped with the skills and knowledge necessary to drive future innovations. This symbiotic relationship between research and education ensures a continuous flow of talent into the workforce, ready to apply cutting-edge knowledge to real-world challenges.

Industry Collaboration: Penn is deeply committed to increasing interactions between the university and industry, including fostering research collaborations, translational research partnerships, and corporate-sponsored research. These efforts ensure that taxpayer-funded

discoveries are developed into new products and services that benefit the public good. The university's initiatives, such as the Penn Center for Innovation (PCI), have helped create more than 250 new companies over the course of the last decade, attracting early-stage capital and fostering an environment conducive to high-tech industry growth. This has a direct impact on regional economic development as these companies have collectively raised or received more than $4B in capital investment, a substantial portion of which is reinvested in the Greater Philadelphia region.

Societal and Patient Impact: Well-known examples of impactful products, technologies and companies developed based on innovations created at Penn include Spark Therapeutics and Luxturna, the first directly administered gene therapying the US, CAR-T technology and Kymriah, the first approved gene therapy modified cell therapy, AAV gene therapy for multiple approved indications, as well as nearly two dozen other FDA approved new medicines. Penn was of course also the source of the foundational mRNA technology created by Nobel Laureates Drew Weissman and Kati Kariko that led directly to the creation of the highly successful COVID-19 vaccines.

Economic Diversification: University research contributes to more than just the development of medical technologies, it also plays a foundational role in helping to drive the development of other critical industries such as robotics, data management, AI, clean energy, and environmentally friendly production methods, just to name a few, helping to position states like Pennsylvania as potential leaders in these areas.

Healthcare System: Penn's large hospital and vibrant healthcare system is not only a cornerstone of the region's medical infrastructure with a direct patient catchment impact of over five million people, but also a significant economic entity in its own right, providing jobs and contributing to the economic health of the area.

In spite of these successes, the path from academic research to commercial and societal impact continues to be fraught with significant hurdles and challenges. The so-called "valley of death", the gap between early and promising research findings and the many different steps and investments required to ensure their full development into market-ready products, continues to pose a significant barrier to establishing academic-industrial partnerships, particularly in emerging technological fields and those which require intensive capital investment. Gap funding programs, small companies, SBIR/STTR type programs are all helpful, but are often insufficient to move promising technologies to a point where they are sufficiently attractive to larger investments from established private sector players. Companies spun out of research centers are often slowed by the need for both skilled and unskilled labor, as well as regional resources, such as contract manufacturing, that they can partner with to efficiently accomplish R&D goals. In addition, a foundational underpinning of the entire university-based technology transfer industry, the Bayh-Dole Act, is currently under attack by proponents of drug-pricing controls pushing for a dramatic expansion of walk-in rights to federally sponsored research discoveries. While institutions like Penn are strongly supportive of fair and equitable drug pricing and access, unfortunately the proposed changes to the Bayh-Dole Act will not accomplish this price-control goal and will instead create significant uncertainty and risk that will negatively impact the interest of potential industrial and private-sector collaborators from partnering with academic institutions reliant on federal research grants.

What can this committee do to help bridge some of these enduring challenges? Here are a few recommendations:

- Support budgetary commitments for expanded STEM education and workforce development, including support for entrepreneurs and managers/serial-CEOs
- Support increased financial commitments/matches for gap funds supporting early-stage technology translation and business development
- Support strategic investments in the development of key regional resources such as manufacturing hubs
- Oppose the currently proposed federal changes to the Bayh-Dole Act

In conclusion, university research is more than just an academic endeavor; it is a vital component of the Pennsylvania and broader US economy. It fuels innovation, drives economic growth, and will continue to position the state and nation as a global leader in technology and industry. As we continue to navigate the unique challenges of the 21st century, university research is a key foundation upon which the future prosperity of the commonwealth and nation will be built.

Senator Laughlin and members of the Senate Majority Policy Committee. It is an honor to be sitting on this panel to discuss the importance of education and training within life sciences.

Thomas Jefferson University, Jefferson Health and Jefferson Health Plans include over 42,000 employees dedicated to educating tomorrow's professionals through transdisciplinary and experiential learning; discovering new treatments and therapies that will define the future of clinical care; and providing nationally ranked, high-quality healthcare coverage to members throughout Pennsylvania and New Jersey. As the region's second-largest employer and largest network of safety net hospitals, Jefferson has dedicated itself to providing care and related services to the commonwealth for two centuries. Jefferson's total economic impact is close to $10B in PA alone.

More than five years ago, executive leadership at Thomas Jefferson University had a vision to develop a business unit with the sole purpose of offering real hands-on bioprocess training opportunities to both students and professionals within the life science sector. With tremendous support by the President of the University and the University Board, along with several industry partnerships the Jefferson Institute for Bioprocessing or JIB, was launched.

In July of 2019 a state-of-the-art facility was completed in a leased building within the Springhouse Innovation Park, a new 133-acre campus located in Montgomery County. Jefferson was one of the first tenants of this 14 building life science campus, formerly owned by chemical manufacturer Rohm and Hass. Today the campus is nearly at capacity with Merck entering as one of the latest and largest tenants. The 25K square foot JIB facility is a one-of-a-kind, fully flexible, simulated GMP facility capable of producing the most advanced lifesaving and life improving therapies available. The space is not only used for training the future of biomanufacturing professionals but also to help advance technologies supporting the industry and to further develop therapeutics to one day reach the clinic. With a recent $2M RACP award, which we are extremely grateful for, JIB is evolving to offer even more innovative training and contract service capabilities.

To date JIB has conducted over 8000 training days, defined as one person trained for one day. We did this across several modalities and dozens of employers, some of which are the largest companies in the commonwealth. JIB has created and delivered 100 distinct courses to industry; tailored to meet the learning objectives of the sponsor company. With a flexible model, focused on upskilling and practical learning, JIB has become a partner to many tackling the need for a highly skilled workforce in a growing Lifescience industry.

Academically, the University has created multiple Master's programs, a PhD program, concentrations at the undergraduate level and a certificate, all of which are offered at JIB to specifically address the growing need for a skilled and trained workforce within the biomanufacturing industry.

To support these programs, the JIB staff works strategically with several local high schools as well as other area Universities and Community Colleges to provide outreach, establish pathways to train at the JIB facility, career counseling and facility tours. The University has also acted proactively to create partnerships at the local, state and international levels to increase the opportunity for collaboration in both research and scholarship.

The University has also obtained several grants focusing on workforce development and advanced training through the National Science Foundation and NIIMBL, with the latest award intended to support early-stage career exploration for underserved communities.

As advocates for scientific research, education, and training within life sciences, we believe that investing in the training of future scientists and healthcare professionals is essential for the advancement of the sector and the well-being of our communities.

Lifesciences is at the forefront of addressing some of the most pressing challenges facing humanity, from combating infectious diseases to developing new treatments for cancer. However, the success relies heavily on the availability of a highly skilled and knowledgeable workforce. A challenge faced by many companies within the commonwealth and beyond.

State-funded training programs play a crucial role in nurturing the next generation of scientists, healthcare professionals, and biotechnology experts. By providing support for undergraduate and graduate education, postdoctoral training, and professional development opportunities, states can ensure that individuals have access to the resources and mentorship they need to pursue careers in the life sciences. This, in turn, helps to cultivate a diverse and talented workforce capable of driving innovation, conducting groundbreaking research, and improving healthcare outcomes for all.

Investing in training initiatives in the life sciences can also yield significant economic benefits for the state. Biotechnology and pharmaceutical companies are major contributors to economic growth, job creation, and innovation, with the potential to attract investment, stimulate local economies, and generate tax revenue. By investing in the education and training of individuals with expertise in the life sciences, states can position themselves as attractive destinations for biotech investment, fostering the growth of the industry and creating high-quality employment. At JIB our trainings not only provide essential skills required to perform complex bioprocessing roles but allow employers to offer learning opportunities to their employees and an additional vehicle to further their careers.

State funding for training in the life sciences can also help address persistent disparities in access to education and career opportunities. Historically marginalized communities, including women, minorities, and individuals from low-income backgrounds, are underrepresented in STEM fields. By providing financial support, mentorship, and outreach programs targeted at these populations, states can promote diversity, equity, and inclusion in the life sciences workforce, ensuring that all individuals can contribute their talents and perspectives to scientific discovery and innovation.

A recent example of state funded support within the sector is the BioHub Maryland initiative and its global partnership with NIBRT, the National Institute of Bioprocessing Research and Training out of Dublin, Ireland. BioHub in collaboration with Hood College plans to offer biomanufacturing training to Veterans and members of disadvantaged communities. This partnership is made possible through $5M in state and federal funding and is heavily supported by AstraZeneca one of Maryland's most significant contributors to the state's economy and growth of life sciences.

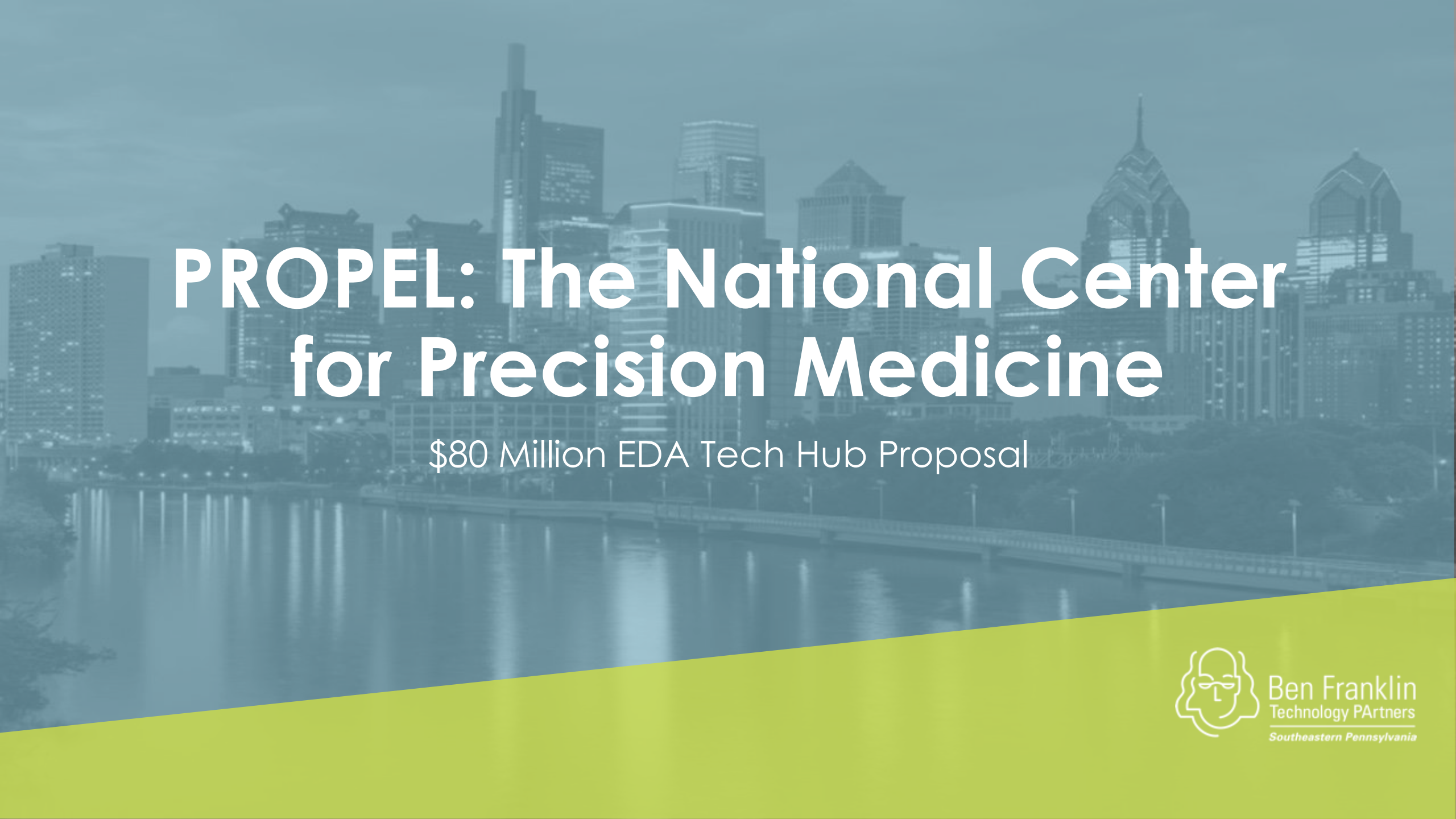
An example of funding support for training right here in Philadelphia is the Keystone LifeSci Collaborative, a forum for industry executives from across southeastern Pennsylvania to collectively address challenges within the region. The collaborative is being supported by $3.4 million in funding from the American Rescue Plan Act and is part of a larger $22.8 million grant Philadelphia Works received under the Good Jobs Challenge to spur job growth in sectors including health care and life sciences, energy, and infrastructure. The goal for the overall grant is to create 3,000 family-sustaining jobs in southeastern Pennsylvania, many of which will require specialized training.

We need more support; we can't do it alone. The need for training in the life sciences is paramount and we need to work together. By investing in education, training, and professional development programs, the commonwealth can foster the development of a skilled and diverse workforce capable of addressing the complex challenges of today. So, I urge you to continue to prioritize this critical issue and allocate the necessary resources to support training initiatives in the life sciences. JIB is here to help any way we can.

Thank you.

Aldo Romano
Chief Business Officer
Thomas Jefferson University
Jefferson Institute for Bioprocessing (JIB)

C 717-317-7996
aldo.romano@jefferson.edu
https://www.jeffersonbioprocessing.com/



PROPEL: The National Center for Precision Medicine

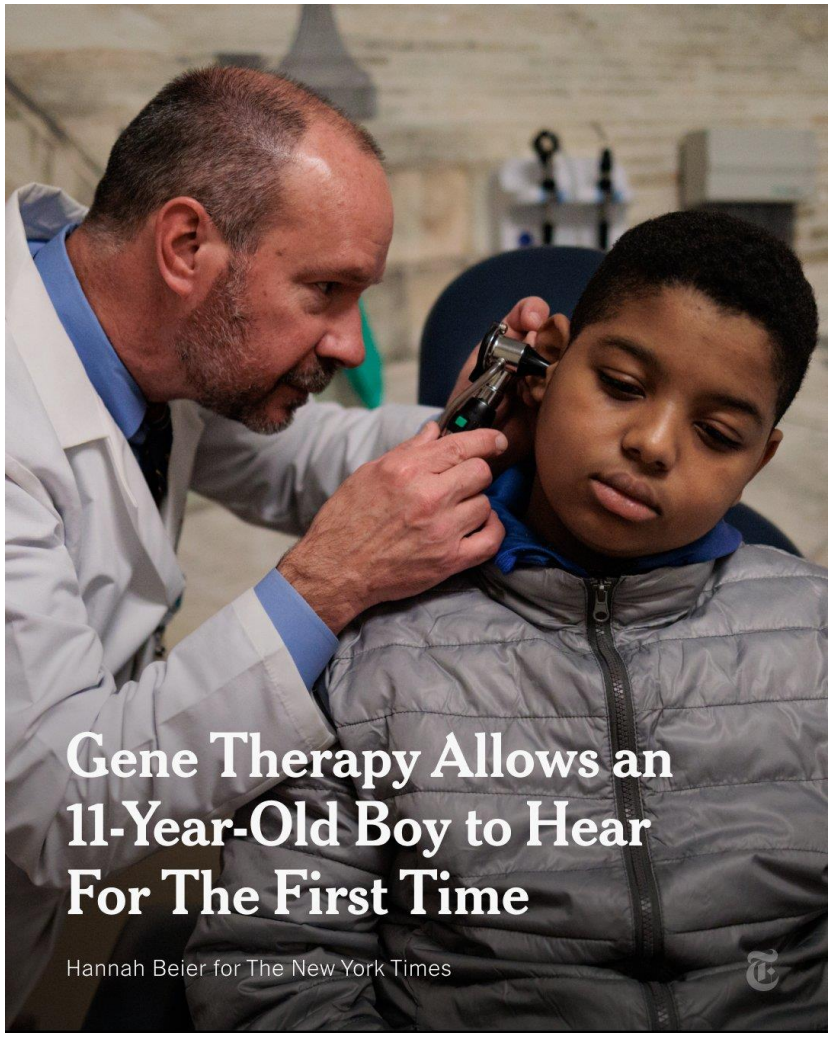
$80 Million EDA Tech Hub Proposal

Ben Franklin Technology PArtners
Southeastern Pennsylvania

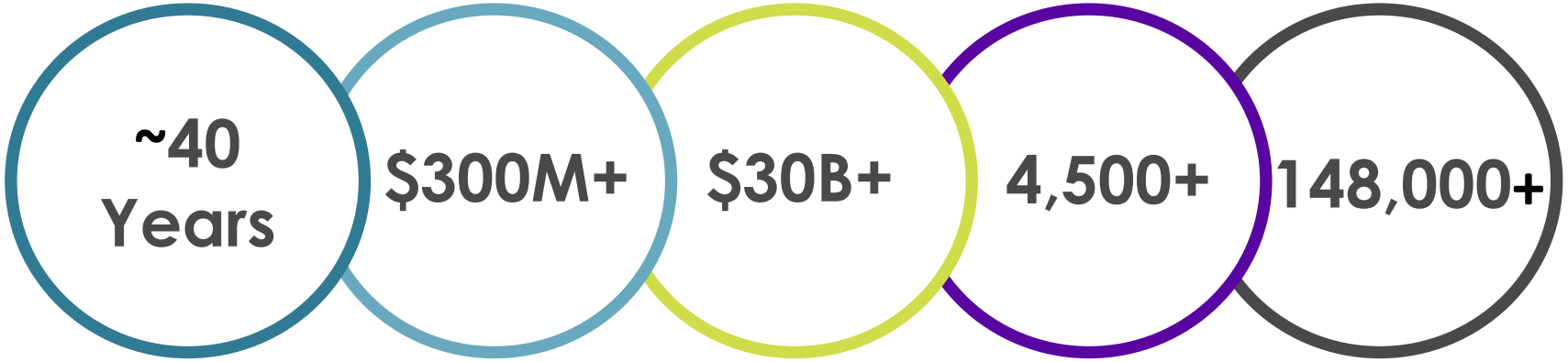
Why PROPEL? Why now?

This January, Aissam Dam, an eleven-year-old boy, was the first person to receive gene therapy in the U.S. for congenital deafness from the Children's Hospital of Philadelphia, allowing him to hear.

This groundbreaking story underscores Precision Medicine's transformative potential, aligning with **PROPEL's** mission to advance technologies that directly benefit communities and individuals while promoting regional health and equitable economic outcomes.



Ben Franklin Network builds companies that drive outcomes to create lasting impact



Annually ranked among the top ten most active investors in the US, per Pitchbook.

Every dollar invested into the Ben Franklin Network by the Commonwealth of Pennsylvania generates more than $4 in State wage and tax revenue.*

*Source: The Economic Impact of Ben Franklin Technology Partners, by Econsult Solutions, Inc., April 2023

PROPEL: The National Center for Precision Medicine

- Leads how we weave the region's Precision Medicine-related assets and stakeholders into a **uniquely integrated alliance** to catalyze the next generation of health interventions.

- Together, the alliance will:
  - mitigate manufacturing and commercialization barriers
  - inform policy agendas and regional advocacy efforts
  - meaningfully engage the community
  - pioneer novel approaches to attract and train a diverse workforce, and
  - implement strategies that ensure new interventions address health inequities and reach under-represented target populations.

PROPEL's Five Components and Lead Partners

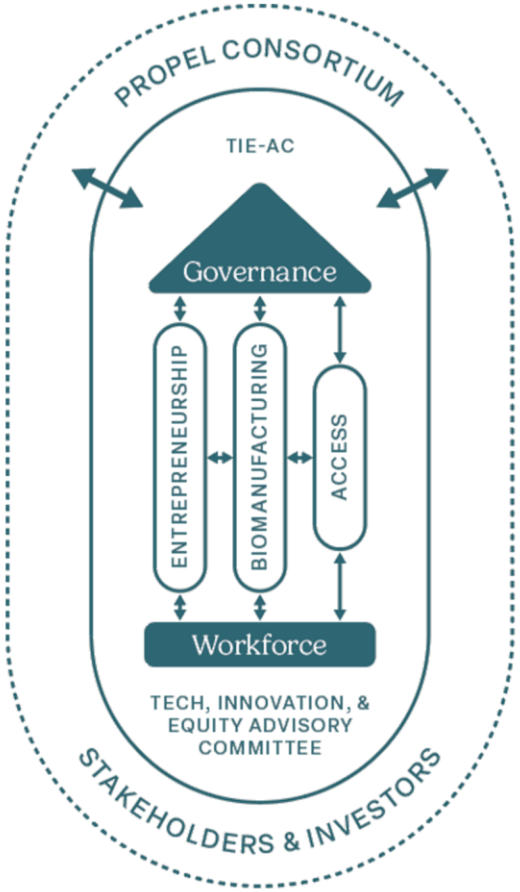
- **Workforce** - Philadelphia Works & Tech Council of Delaware
- **Entrepreneurship** - Delaware Innovation Space and Ben Franklin
- **Biomanufacturing** - University of Delaware/NIIMBL
- **Governance** - Ben Franklin
- **Access** - Healthshare Exchange, Drexel University, & Virtua Health

PROPEL By The Numbers

- $80,700,000 budget
- 70 committed partners and over 100 regional organizations
- $9 million in cash match
  - $5 million from the Commonwealth of PA
  - $1 million from The City of Philadelphia
  - $1 million from Delaware
  - $2 million in private cash match
- More than $50 million is expected to flow into Pennsylvania

Jobs created and retained

Projecting 7,500 new, high-paying, sustainable jobs.



Over 5 years, translates to >20,000 total jobs.

Over 5 years, earnings of $2B and over $175M in taxes.

Participants

Lead Member and Project Leads Ben Franklin Technology Partners of Southeastern PA| Drexel University | Delaware Innovation Space | Healthshare Exchange | Philadelphia Works | Healthshare Exchange | Tech Council of Delaware | University of Delaware/NIIMBL | Virtua Health

Partners with Committed Matching Funds Lead Member & Project Leads | City of Philadelphia | Commonwealth of Pennsylvania | State of Delaware | Knight Foundation

Institutions of Higher Education Cheyney University (HBCU) | Community College of Philadelphia | Delaware County Community College | Delaware State University (HBCU) | **Drexel University** | Lincoln University (HBCU) | Rowan University | Rutgers-Camden University | Temple University | Thomas Jefferson University | University of Pennsylvania

State & Local Government City of Philadelphia | City of Philadelphia Department of Commerce | Commonwealth of Pennsylvania | Delaware Division of Small Business | Economic Development Departments of Bucks, Chester, Delaware & Montgomery Counties | New Jersey Economic Development Agency | State of Delaware

Industry or Firms in Relevant Technology, Innovation, or Manufacturing Sectors 3.0 University Place | Amazon Web Services | B.Labs | BioLabs | BioNJ | Brandywine Realty Trust | Cambridge Innovation Center | Center for Breakthrough Medicine | Children's Hospital of Philadelphia | ChristianaCare Health | Delaware BioScience Association | EMSCO | Helaplex | Lifesciences PA | Independence Blue Cross | Jefferson Health System | Johnson&Johnson Innovation | Main Line Health | Mobilion | Nemours Children's Health | NextFab | PA Biotech Center | Partners for a Cure | Penn Medicine | Pennovation Center | PIER Clinical Trial Consortium | Spark/Roche | Temple Medicine | ThermoFisher | **Virtua Health** | Wexford Science & Technology

Organizations Focused on Improving Science, Technology, Innovation, Entrepreneurship, or Access to Capital Baruch S. Blumberg Institute | Christiana Gene Editing Institute | **Delaware Innovation Space** | **Healthshare Exchange** | Mentor Connect | NSF I-Corps (Northeast Hub) | PACT- Philadelphia Alliance for Capital and Technology | Wistar Institute

Workforce Training Organizations Jefferson Institute for Bioprocessing | **Philadelphia Works | Tech Council of Delaware** | Wistar Institute Biotechnology Training Program

Economic Development Entities Greater Philadelphia Chamber of Commerce | Delaware Prosperity Partnership | Philadelphia Industrial Development Corporation (PIDC) | University City Science Center

Organizations Contributing to Increased Participation of Underrepresented Groups in STEM Coded by Kids/1Philadelphia | STEM Equity Alliance | West Philadelphia STEM Academy | Zipcode Wilmington

Venture Development Organization Ben Franklin Technology Partners of Southeastern PA

Manufacturing Extension Centers DVIRC-Delaware Valley Industrial Resource Center | New Jersey Manufacturing Extension Program

Manufacturing USA Institute University of Delaware/NIIMBL

Thank You

partnerswithapurpose.org

Statement from Louis P. Kassa III, MPA, Chief Executive Officer

I would like to thank the committee for this opportunity to discuss Pennsylvania as an Innovation Leader and specifically nurturing early-stage companies.

My name is Lou Kassa and I'm the Chief Executive Officer of the Hepatitis B Foundation, the Baruch S. Blumberg Institute and the Pennsylvania Biotechnology Center, three related non-profits. We also manage and operate B+Labs at the Cira Centre with our partners Brandywine Realty Trust. The Pennsylvania Biotechnology Center and B+Labs are life sciences incubators, with a total of 74 companies on site. We've had quite a bit of success the last few years with eight IPO's, a few billion dollars in company value created, and consistently ranked in the top 10 nationally for life sciences incubators.

Over the past 10 years, I have witnessed firsthand all Pennsylvania has to offer in the life sciences industry. We have all the tools and ingredients to lead the nation in life sciences. We are top five in NIH funding and patents, and we are the birthplace of cell and gene therapy.

Pennsylvania is also a large part of the "Pharma Belt," which stretches from North Jersey down to Philadelphia and Delaware. Within 100 miles of this location is 80% of all U.S. Pharma. So, we have the talent, we have the academic institutions, we have everything it takes to be a thriving life sciences cluster. But, over the last several years, we have fallen from number five in life sciences cluster ratings to number nine. What is missing? Quite simply, state investment and venture capital.

States such as Massachusetts, Texas, New Jersey, Maryland and others are investing in life sciences and experiencing great returns from their investments. For Pennsylvania to retain and recruit life sciences entrepreneurs and companies, compete with other states, and grow the industry, a significant investment is needed to push our cluster to the top. Once the state's investment is made, the venture capital will follow. Venture capital wants to invest where their dollar goes the furthest.

Currently, the 74 companies that we incubate are having a hard time surviving without this funding. This impacts their science by delaying or stopping the potential for the next big breakthrough medicine or cure.

Since 2022, 500 people in life sciences have been laid off in the Greater Philadelphia area. Most all of these layoffs are due to lack of funding.

In 2021, we bootstrapped our own 50-million-dollar venture capital fund, the HatchBio Fund, to help these companies in need. To date, we have raised 32 million dollars and have started investing in Pennsylvania companies. Others, such as Ben Franklin Technology Partners, are also trying their best to make our industry thrive, but it's simply not enough. We are fortunate to have such great support from our local and state legislators, we have some great champions, but for Pennsylvania to make an impact, we need investment, incentives, and workforce development to grow our biotech cluster.

The Pennsylvania Biotechnology Center had a 7.3-billion-dollar economic impact on the state over the last five years, including an average of 127 million dollars spent by our companies in Pennsylvania. It is my opinion that we can do so much more. States such as Massachusetts, Texas and New York have made billion-dollar investments and provide many incentive programs to attract companies and retain them. These states are also seeing billions of dollars in economic impact from these investments.

It’s time for Pennsylvania to leverage the life sciences industry and move from the bottom part of the top ten in the country, to the upper half, while also creating great discoveries for humankind and thousands of jobs and opportunities for our citizens.

Thank you for the time today to discuss these issues.

Albert Gianchetti, President & CEO, XyloCor Therapeutics, Inc.

Testimony – April 11, 2024

Senate Majority Policy Committee

Good afternoon, Chairman Laughlin and members of the Senate Majority Policy Committee. I am Al Gianchetti, President & CEO of XyloCor Therapeutics. Thank you for giving me the opportunity to participate in today's hearing on Pennsylvania as an Innovation Leader. I would like to start my remarks by giving you some background information on myself and XyloCor Therapeutics.

XyloCor Therapeutics is a biotech startup company based in Wayne, PA. We are developing a gene therapy for advanced coronary artery disease. Coronary artery disease occurs when atherosclerosis causes a narrowing of blood vessels in the heart. This not only puts people at high risk for a heart attack, but it can also advance to a condition called chronic stable angina. This is a condition caused by an imbalance between the supply and demand of blood to serve the heart. At rest, a person with chronic stable angina is fine because the heart is at rest beating at a normal rate and the demand for blood and oxygen is low, but when there is physical exertion like walking up a flight of stairs the heart starts beating faster and requires more blood flow to perform this extra work and as this occurs the narrowed blood vessels cannot keep up with the hearts demands and this causes chest pain. This chest pain can be debilitating and feels similar to having a heart attack, so it is not only painful, it is frightening because people ask, is this another episode of angina or is it a heart attack this time. Initially, chronic stable angina is managed by medications.

Eventually, as the disease progresses, medications are no longer sufficient and people end up in the cardiac cath. lab having a stent put in. This is a procedure where a mesh like tube or stent is placed inside the diseased blood vessel to keep in open and clear so more blood can flow through it. Think of it as debris on the road narrowing the Schuylkill Expressway down to 1 lane of traffic and clearing that debris opening up to 2 lanes allowing more traffic to pass. This procedure is often a successful procedure but over time the coronary artery disease progresses further, and people can require bypass surgery. This is when an open heart surgery procedure is done and an artery from the leg or arm is removed or grafted or installed in the heart to bypass the diseased blood coronary vessel or vessels. Using our traffic analogy again, this is like building a new artery like the Blue Route or 476 to bypass the Schuylkill Expressway altogether. Again, this is often successful but even after this procedure the disease can continue to progress, and many people are left with their ongoing episodes of chest pain and no treatment options. These patients have "no option" refractory angina. These people really struggle because their chest pain prevents them from doing the things, even the simplest things, they love to do. One patient in our first clinical trial told us he worked in a factory 45 years and finally retired to learn that his angina would not allow him to enjoy retirement the way he dreamed of. Eventually, he lost hope. These are the people we are trying to help with our gene therapy which is known as encoberminogene rezmadenovac or XC001 for short. Our approach is different. Rather than trying to fix damaged blood vessels, or to bypass diseased blood vessels, our drug candidate can improve blood flow to the heart by creating new blood vessels. We do this by a new approach called gene therapy where we insert a gene into the heart cells that

instructs the cardiac cells to produce a naturally occurring protein that creates new blood vessels. These new blood vessels can enable people to live a more normal life by performing every day activities without chest pain. We completed our first clinical trial in 2023 and we have very encouraging results that will be published in a prestigious cardiovascular journal in May. We are now raising capital so we can complete our next clinical studies.

I was born and raised in the Philadelphia area and went to Penncrest High School in Delaware County or Delco, did my undergraduate studies at University of Delaware and graduate school at Drexel. I have 3 children. My daughter Lauren did her graduate studies at Temple and graduate studies at USC. My first son, Matthew studied at Shippensburg University, and my second son Christopher will graduate from University of Pittsburgh later this month. I play in 2 bands that play in the Delco bar circuits. I went to the Sixers championship parade in 1983, the Phillies parade in 2008 and had an Eagles 2018 parade watch party at my home in honor of my dad who was a hardcore Eagles fan and was at the game at Frankin Field when Eagles fans through snowballs at Santa Claus. Dad died from heart disease just a couple of years before the Eagles Superbowl win. So you get the idea, I am deep rooted here in the Keystone State.

In my career, I spent around 20 years at GlaxoSmithKline or GSK, a big pharma company with a big presence in the Philadelphia area. XyloCor got its start when I was introduced to one of the co-founders, Dr. Ronald Crystal, one of the pioneers in gene therapy and the head of genetic medicine and Weill Cornell Medical College in New York City. Dr. Crystal and Dr. Todd Rosengart, a cardiovascular expert, discovered the gene therapy that XyloCor

is currently developing. It is quite common for university researchers to make new drug discoveries and then hand it over to drug development experts at small biotech companies to take the research forward into human studies. I was recruited by them because of my experience working on cardiovascular drugs at GSK. I was very impressed with the potential of their technology, so I signed on as the CEO of the newly started XyloCor Therapeutics. The founders wanted me to locate the company in New York City. However, I convinced them that the Philadelphia area is the best location for the company. Why? First in foremost, human talent. Drug development is complicated work and takes a very talented and multidisciplinary team. This area is rich with talent from the pharmaceutical companies like GSK, Merck and J&J. In addition, the skill and talent from academic institutions like University of Pennsylvania, Temple, Jefferson, Pitt and Penn State help to drive life science innovation in Pennsylvania. In addition, many of the service providers that serve the biotech industry like contract manufacturers, clinical research organizations and labs are located here. That makes a difference. When we needed an important and unique laboratory test to progress our drug candidate, we select and lab in Exton, PA and I went to the contract lab, met with the scientists and showed them videos of patients struggling with refractory angina explain their disease in their own words. The scientists were so inspired, they not only successfully delivered the lab test, they delivered it ahead of schedule. Finally, our trade association, Life Sciences Pennsylvania, provided office space to us as we got the company off the ground and more importantly connected us with expert support services that helped us in the early stages of the company and continue to help us today.

My decision to locate XyloCor Therapeutics here in Pennsylvania has paid off for shareholders and more importantly, for patients who may benefit from the drug we are developing. I am very encouraged that the Senate Majority Policy Committee is giving such attention and focus to Pennsylvania as an Innovation Leader. I believe your leadership can help grow innovation in Pennsylvania and while I am not sure what policies will make a difference, I am happy to be a part of the effort to figure that out.

Thank you for the opportunity to address the Committee today.

Rick Taylor, Adare Pharma Solutions
Testimony – April 11, 2024
Senate Republican Policy Committee Hearing on Innovation and Emerging Technologies

Good morning, Chair Laughlin and members of the Senate Policy Committee. I am Rick Taylor representing Adare Pharma Solutions. We are very pleased and honored to have the opportunity to come before you in today's hearing on innovation and emerging technologies in the Commonwealth.

Adare occupies an important and emerging part of the life sciences eco-system in the Commonwealth. Our niche area is what is called a Contract Development and Manufacturing Organization or CDMO. In other words, we are a global technology-driven company providing product development through commercial manufacturing expertise focused on oral dosage forms for the pharmaceutical industry. Adare's specialized technology platforms provide taste masking, controlled release, solubility enhancement, and patient-centric dosing solutions. With a proven history in drug delivery, Adare has developed and manufactured more than 65 products sold by customers in more than 100 countries globally.

We have operations in seven sites throughout the United State and Europe, including two locations in Pennsylvania. We employ about 800 employees with more than 250 in the Commonwealth. We are currently headquartered in New Jersey; however, we are in the final decision-making process to relocate our headquarters. Among the locations that are under consideration for the HQ is Pennsylvania. We purchased our PA facilities 2 1/2 years ago. Had it not been for our acquisition the two sites would have closed resulting in the loss of 200+ jobs.

Those sites suffered from a lack of investment in equipment and deferred maintenance on the buildings.

Since then, we have made substantial capital investments in the sites such as replacing the roof (essential for Good Manufacturing Process facilities); upgraded our packaging equipment; and built out a vault that can hold Schedule II controlled substances. Our future investment will be in building high potency suites that can handle crucial lifesaving but toxic therapies such as cancer drugs. Furthermore, over the next three years we are looking to grow the number of employees by 50% in Pennsylvania. In the last quarter alone, we have employed more than 50 new headcount. We hire at all levels from manufacturing operators, who may only require a high school diploma or equivalent, to PhDs for our R&D work. We pay family sustaining wages, offer all employees participation in our bonus program, and on top of that, our benefits are significantly above market. In other words, Adare, and companies in the life science ecosystem are bringing significant economic value and tax receipts to the Pennsylvania economy. We are enthusiastic to be a part of the story of Pennsylvania's life science sector. Given the purpose of this hearing, I know it is not lost on you about how important the life sciences industry is to our current and future prosperity as a Commonwealth.

Recently Gov Josh Shapiro shared his vision of five key areas of innovation to foster and invest in: life sciences, manufacturing, agriculture, energy, and robotics. We squarely occupy the first two segments. We hope that you share the same view in the criticality of the life sciences and manufacturing companies for our future of innovation and competition with other states. As we discern our HQ relocation, we are working on a package of incentives from the Commonwealth such Pennsylvania First which looks at job creation and the quality of expansion. While the program is appreciated, it really is opaque on how it works and how awards are determined, and

because of that we are not always sure that we are asking DCED the correct questions to maximize the incentives.

I do want to give recognition and appreciation to Gov Shapiro and Ben Kirshner to the creation of The Office of Transformation & Opportunity. We have been working with them closely and they have been critical in helping us navigate all the programs in Pennsylvania or Philadelphia that may be of interest.

Also as part of the life science eco-system we believe we need to foster this sector at all stages. We support the priorities set forth by Life Sciences PA that incentivize investment in research and development – policies such as increasing the Research & Development Tax Credits, maintaining and expanding funding for programs like the Keystone Innovation Zones, Life Sciences Greenhouses, and Ben Franklin Technology Partners And of course, and generally creating a favorable tax policy that allows organizations like Adare to make critical investments in our workforce and upgrading equipment.

Again thank you for the invitation of Adare to speak and your broader interest in innovation and emerging technologies. I will be happy to answer any questions you might have,

Founded in 1999 by Scott Bentley, VideoRay LLC has pioneered the field of smaller underwater remotely operated vehicles (ROVs), and established itself as a global leader in underwater exploration and inspection technology.

With a mission to provide accessible, innovative solutions for underwater inspection, VideoRay launched its compact and affordable Pro series of micro ROVs in 2002. These vehicles - noted for their ease of use, versatility, and durability - were quickly adopted by users around the globe for their ability to accomplish challenging search and recovery, marine research, aquaculture, and offshore energy inspection missions.

In 2017, with an eye to meeting increasingly complex and challenging requirements, VideoRay evolved its focus from delivering small low-cost ROVs to engineering more highly capable vehicles better suited for sophisticated underwater tasks requiring enhanced size, power, tools, and capabilities. This resulted in the design of their Mission Specialist Defender ROV, which was selected for the U.S. Navy's Maritime Expeditionary Standoff Response (MESR) program to support mine countermeasure and other US Navy applications. To date, over $55 million worth of Defenders have been purchased to support US Navy initiatives, and VideoRay ROVs are quickly being adopted by allied militaries around the globe.

VideoRay continues to innovate, explore, and invest in the resources needed to continuously push the boundaries of what's possible utilizing inspection class vehicles, including its 2023 acquisition of Blue Ring Technology. Through a commitment to excellence and a passion for exploration, VideoRay has revolutionized how we discover and interact with the underwater world, earning widespread acclaim for its groundbreaking contributions to marine technology.

Scott Bentley currently serves as Executive Chairman of VideoRay and remains a key contributor to the organization's strategy, alongside the current leadership team.

The newest VideoRay underwater robot, the Mission Specialist Ally was deployed at the Key Bridge. VideoRay assisted the Baltimore Police and the FBI at the accident site

Iovance Biotherapeutics Testimony to Senate Majority Policy Committee
April 11, 2024

Good afternoon, Senators, and thank you for the opportunity to share my thoughts with you today on this critical topic. My name is Anne Brooks, and I am the Senior Vice President of U.S. Commercial at Iovance Biotherapeutics.

Iovance Biotherapeutics aims to be the global leader in innovating, developing, and delivering novel cell therapies for people with cancer. On February 16, the Food and Drug Administration (FDA) approved AMTAGVI (lifileucel) suspension for intravenous infusion. AMTAGVI is a tumor-derived autologous T cell immunotherapy indicated for the treatment of adult patients with unresectable or metastatic melanoma previously treated with a PD-1 blocking antibody, and if BRAF V600 mutation positive, a BRAF inhibitor with or without a MEK inhibitor.

Cancer is among the leading causes of death worldwide.[1] In 2024 alone, it is estimated that there will be over 8,000 U.S. patient deaths due to melanoma.[2] Our technology seeks to utilize a patient's own immune cells to deliver a personalized approach to fighting cancer. When cancer is detected, the immune system creates cells called tumor infiltrating lymphocytes, or TIL, to locate, attack, and destroy cancer cells in the body. If cancer prevails, TIL are unable to perform their intended function. That's where we come in. At our Iovance Cell Therapy Center (iCTC) in the Navy Yard in Philadelphia, our employees manufacture novel cancer cell therapies from a process that rejuvenates and multiplies a patient's tumor infiltrating lymphocyte (TIL) cells so they can be returned to the patient to fight cancer.

We are strategically located in Philadelphia – a leading area in the development of cell and gene therapies and the home of leading academic institutions active in research. Greater Philadelphia's support for workforce training and development will be essential to allowing the region to capture future growth in cell and gene therapy versus competing areas.

Since breaking ground at the iCTC in 2019, Iovance has expanded from less than 15 employees in Philadelphia to more than 200 in the completed facility today. We currently supply TIL therapies for patients in clinical trials, and within days of receiving FDA approval, we began manufacturing our first commercial product. We expect significant growth to continue as we expand our manufacturing capacity and staffing to maintain commercial demand of our first in class cell therapy in the U.S. and as we serve additional geographies, types of cancer, and next generation therapies.

Iovance employs a diverse workforce that resembles the Greater Philadelphia community. A variety of backgrounds, as well as a broad range of academic experiences, are represented across the organization including manufacturing technicians, scientists, and management professionals. We also collaborate with local academic institutions to train and develop the next generation of talent. Our relationship with the Community College of Philadelphia (CCP), for example, assists in preparing CCP students for roles in the biopharmaceutical industry in Philadelphia. A group of CCP students recently toured our facilities and participated in an interactive Q&A session to find out more about our qualifications for hiring.

We have also partnered on a skills initiative with Wistar, the West Philadelphia Skills Initiative (WPSI), the Chamber of Commerce, and PIDC for the Biomedical Technician Training Program. Philadelphians

[1] https://www.cancer.gov/about-cancer/understanding/statistics
[2] American Cancer Society. Key Statistics for Melanoma Skin Cancer.

with at least a high school equivalency are eligible to participate in class- and lab-based training followed by a 12-week externship at Iovance. Participants who successfully complete the program are considered for employment at Iovance as associated aseptic manufacturing technicians. We hired 10 program graduates from the inaugural cohort last year and a second class of participants graduated from the program on March 22. We hope our collaborations with local schools and organizations will serve as a model to build deep, diverse life sciences talent pipelines across Greater Philadelphia and beyond.

We are constantly evaluating the right locations to grow our business and have explored expansions across the U.S. (e.g., Atlanta, Dallas) as well as globally (e.g., Amsterdam, Zurich, etc.). We chose to make Philadelphia our manufacturing hub. We encourage the city and the state to advance policies that incentivize new and existing biotech development in the region to cement Pennsylvania's position as a leading hub for cell and gene therapy. For example, we urge the state to review its policy on net operating loss (NOL) caps. NOL deductions have helped to reward biotech innovators and spur further investment in R&D, particularly in biotech hubs without caps such as California and Massachusetts. Pennsylvania is one of only two states that cap NOL deductions below the federal limit of 80 percent. In order to attract more startup biotech companies who often spend years with net operating losses while investing in R&D for complex therapies, Pennsylvania should consider removing the cap on NOL deductions. We also encourage the state to expand the existing Keystone Opportunity Zone (KOZ) program to more parcels and extend the duration of those abatements to take into consideration relevant factors for the site operator for when it is "in use" - for biotech, that would include regulatory delays at the federal level.

We'd be happy to be a resource to the Committee as it continues these discussions and evaluates ways the state can promote growth in the biotech industry.

Broadcom
3421 Hillview Ave
Palo Alto, CA 94304
broadcom.com

April 11, 2024

The Honorable Senator Dan Laughlin
Chairman, Senate Republican Policy Committee
Pennsylvania General Assembly

Dear Chairman Laughlin and Committee Members:

Broadcom appreciates the opportunity to offer written testimony for this hearing on Pennsylvania as an Innovation Leader. We commend the Committee on its focus on this topic in this pivotal moment for enabling and capitalizing on innovation in the Commonwealth.

As a global infrastructure technology leader, with roots based in the rich technical heritage of AT&T/Bell Labs, Lucent and Hewlett-Packard/Agilent, Broadcom focuses on technologies that connect our world. We serve customers in the data center, networking, software, broadband, wireless, storage, and industrial markets, at all levels of US government, including across a wide range of Pennsylvania state and local government agencies.

Broadcom has a significant presence in the Commonwealth, with offices in Allentown, Breinigsville, Lancaster, and Pittsburgh. With more than 500 employees in the Commonwealth, Broadcom's operations focus on semiconductor design and manufacturing, as well as infrastructure software development.

Roughly half of our Pennsylvania employees work in Breinigsville, which is part of Broadcom's Optical Systems Division (OSD) and responsible for developing and manufacturing devices used in optical communications. These advanced products, including leading-edge heterogeneous integration packaging, are core technologies that enable high-speed broadband communication networks and advanced data centers – technologies that are necessary for leading-edge products, such as large-scale Generative Artificial Intelligence (GenAI) and large language model (LLM) clusters.

Given this expertise in semiconductors and in infrastructure software, we bring a unique perspective to the challenges and opportunities presented by Artificial Intelligence (AI). We wish to share this expertise as the Committee seeks to foster a policy environment that supports innovation and business growth.

GenAI, especially in the form of LLMs, is at the forefront of technological innovation. Its potential is enormous, but implementing LLMs brings about unique challenges, notably in ensuring the privacy, security, and control of highly sensitive data used in or created through LLMs. Private AI, a term of art to describe a non-proprietary platform and technical architecture, offers a strategic solution for government and other critical industries, such as financial services, healthcare, energy, and telecom, that depend on highly sensitive data when implementing GenAI. By allowing for complete control over sensitive data, private AI fosters trust and transparency, ensuring that sensitive information and intellectual property are securely protected.

Private AI aims to balance business and operational gains from GenAI with the practical privacy and compliance needs of the organization. Private AI can be deployed in conjunction with existing technologies in on-premises data centers, virtual private clouds, hybrid clouds, public clouds, and

edge sites. In contrast, public AI, sometimes referred to as commercial AI, is a publicly available AI algorithm that is trained on publicly available data from across the internet, such as text articles, images, and videos. Often this data is then retained and used by the public AI entity to train the LLM for future public consumption.

There are significant privacy and business operational risks that can result from the use of public AI, including data and intellectual property leakage, security, model accuracy, "hallucination" (from the use of biased, inaccurate, and/or unrepresentative data), data privacy, and lack of transparency in result outputs. Public AI models are highly complex and costly deployments that require more accelerators like graphics processing units (GPUs) and require libraries from varied sources to develop. Because LLM testing and execution of data queries necessitate hardware acceleration, management of enormous data sets, and place significant infrastructure demands, there can also be performance issues.

With private AI, an organization maintains full control of its data, and its data is not used to train, tune, or augment any commercial or open-source software models without the organization's consent. The organization can leverage other AI models for a shared data set as its business needs require. Private AI allows for access controls to govern access and changes to AI models, associated training data, and applications. Audit logs and associated controls are also essential to ensure that governance policies are satisfied. Further, as organizations seek to access compute capacity and trained AI models which reside adjacent to where data is created, processed, and/or consumed, the highly distributed nature of private AI can help accelerate innovation in edge environments.

As AI technologies see increasing adoption in important societal applications, particularly by governments, it is critical to develop and deploy these techniques responsibly with a clear set of guiding ethical principles, particularly with data privacy in mind. The GenAI market is poised to grow from a market size of just $40 billion in 2022 to $1.3 trillion by 2032 according to a report by Bloomberg Intelligence (BI)[1]. As GenAI uses become more readily available in government and industries across the Commonwealth, it is critical to consider how the underlying AI infrastructure can enable organizations to exercise choice and avoid vendor lock-in, deliver unified management and operational functionality, and lower compute costs while increasing efficiency.

Broadcom appreciates the Senate Republican Policy Committee's focus in this hearing and its ongoing efforts to ensure a policy environment that supports innovation and business growth. Broadcom welcomes the opportunity to continue the conversation around this important issue with the Committee and your colleagues. Thank you for the opportunity to share our perspective as a global infrastructure technology leader with deep roots in Pennsylvania.

Sincerely,

Robert P Hoffman

Robert Hoffman
Head of Government Affairs
Broadcom Inc.

[1] https://www.bloomberg.com/company/press/generative-ai-to-become-a-1-3-trillion-market-by-2032-research-finds/

Christopher P. Molineaux, Life Sciences Pennsylvania
Testimony – April 11, 2024
Senate Republican Policy Committee Hearing on Innovation and Emerging Technologies

Chair Laughlin and Members of the Senate Policy Committee:

Thank you for the opportunity to provide written testimony for the April 11 hearing on innovation and emerging technologies in the commonwealth.

Life Sciences Pennsylvania is the statewide trade association representing more than 900 member organizations in the Commonwealth's life sciences ecosystem. Those members are comprised of small biotech companies, large pharmaceutical manufacturers, academic research institutions, medical device and diagnostics makers, patient advocacy organizations, and myriad service providers related to the development of groundbreaking therapies and cures.

Life Sciences PA was honored to speak at the hearing in September last year, along with several of our member organizations. We are pleased several of our members including – XyloCor Therapeutics, Adare Pharma Solutions, Iovance Biotherapeutics, the University of Pennsylvania, Jefferson Institute for Bioprocessing, Rockland Immunochemicals, Montgomery County Community College, Ben Franklin Technology Partners of Southeastern Pennsylvania and the PA Biotech Center of Bucks County – will be participating in today's hearing.

These member organizations comprise a strong cross-section of the life sciences establishments that make up the robust life sciences ecosystem in southeastern Pennsylvania. While we are a statewide association, the Southeast region is home to a significant number of our member organizations that play an important role in the Commonwealth's innovation economy.

There is no better example of this leadership than in the cell and gene therapy sector, where Philadelphia is a national and global leader. The region is home to the first FDA-approved gene therapy for genetic diseases and the first FDA-approved cell therapy. The academic research institutions in the region bring in more than $1.3 billion in National Institutes of Health (NIH) funding and the area is home to more than 60 cell and gene therapy companies. This sector of the life sciences also attracted $2.6 billion in venture capital funding from 2020-2021 and was ranked the second (behind Boston) Cell and Gene Therapy Hub in comparison to fourteen other regions in the United States.

This sector is not only an economic driver, but more importantly, is researching, developing, and manufacturing novel medicines and technologies for millions of patients around the world facing thousands of unmet medical needs.

The same can be said for life sciences entities throughout Pennsylvania. The Commonwealth has more than 3,000 life sciences establishments in total.

Those organizations – academia, manufacturers, and R&D intensive companies – makeup a robust ecosystem that directly employs more than 102,000 individuals, which represents a more than 50% increase from 2015.

This ecosystem accounts for more than $61 billion in direct annual economic impact in the Commonwealth. In addition to the economic output, the industry is also responsible for $18.4 billion in wages and salaries and $4.9 billion in federal, state, and local tax revenue. Additionally, there is a significant multiplier effect of approximately three to four times for all the impact numbers.

These numbers are all important, but perhaps the most important is that of the 3,000 life sciences establishments, approximately 67% of them are organizations with fewer than 10 employees. While the statistics above paint a positive picture of the state's life sciences economy, it is critical that policymakers know this is largely a start-up community. With that start-up community comes significant hope and positivity as these companies work to develop medicines and technologies for unmet medical needs throughout the world. However, this is also a very fragile community.

The likelihood of success in the life sciences (particularly the biopharmaceutical sector) industry is low – almost 90 percent of the new drug applications filed with the FDA fail to receive approval.

Human biology remains very complicated. Even as we have seen significant strides made in curing disease – Hepatitis C therapies have cure rates above 90%, the U.S. death rate for HIV & AIDS has fallen nearly 85% and cancer death rates in the U.S. have fallen 23% - we know there are patients around the world waiting on the efforts of Pennsylvania companies and the researchers and scientists they employ.

However, science is incremental, and many companies will work tirelessly for the better part of a decade only to find they must start all over again – and all the resources they just poured into their work are sunk costs. Even with those odds, the United States, thanks to its scientific leadership, dogged persistence and (perhaps most important) its free-market system, is the undisputed leader in innovation, producing 57% of all new medicines in the world.

Those statistics are one of the reasons why these hearings are so important – policies put forth by government at the state (and federal) level have a significant affect on life sciences company growth and how those companies can attract investment. Because of the long timelines and resource-intensive nature of taking a medicine or technology through the clinical trial process, investors often look to alternative,"safer" investment options with quicker rates of return. Given today's challenging capital markets, concerns around components of the *Inflation Reduction Act*, and other economic uncertainties, many of our start-up CEOs face difficult financial and talent decisions.

For those reasons, we believe state government intervention is and can be a real catalyst for success. Life Sciences PA is supportive of several existing programs such as the Life Sciences Greenhouses, R&D Tax Credit, Qualified Manufacturing Innovation and Reinvestment Deduction (QMIRD), and lowering of the Corporate Net Income Tax. These are all necessary for innovative sectors like ours to thrive.

However, you can make the case that Pennsylvania's life sciences ecosystem is thriving despite limited government assistance, not because of it. That can be good as it insulates the industry from ebbs and flows that come with political change, but there is room for the government to do more to bolster our innovation economy – especially in the life sciences – policies that invest in talent and leadership, remove physical and financial barriers to equipment, facilities and space – and generally de-risk – early-stage companies, and market the ecosystem to stakeholders outside the Commonwealth are all important things to consider.

Pennsylvania's life sciences ecosystem is thriving as evident by the following statistics:

- The Commonwealth is home to world-class research institutions that attract billions in federal funding – more than $2 billion in NIH funding (and $32.9 million in NSF funding for 2021) – for basic scientific research. In fact, the University of Pittsburgh and University of Pennsylvania were two of the top-five NIH grant recipients in 2022.

- Additionally, those institutions and others in PA, awarded 2.9 million degrees (bachelor's or higher) in the life sciences disciplines in 2020. PA institutions also awarded 559 doctoral degrees in the life sciences discipline. Those numbers rank third and fourth, respectively, when compared to peer states.

- Beyond our academic leadership, Pennsylvania has a long legacy of pharmaceutical manufacturing and is home to a significant physical footprint of many of the world's leading biopharmaceutical and medical technology companies – Merck, Johnson & Johnson, GlaxoSmithKline, Spark Therapeutics, Bayer, and Smith & Nephew, among many others.

- Finally, our academic or teaching hospitals and health systems, and their proximity to these companies and researchers, make Pennsylvania home to approximately 1,200 ongoing clinical trials – placing the Commonwealth 4th for clinical trial activity.

All these statistics rank Pennsylvania among the top 10 life sciences states in the country, and we believe increasing support to this sector and to our innovation economy at large is a smart investment that plays to one of our commonwealth's greatest strengths.

However, this industry faces steep competition from our peer states (e.g. California, Massachusetts, New York, and North Carolina) if we simply remain content with the industry as outlined above.

Specific to the life sciences our programs pale in comparison to what other states – such as the $1 billion fund (now up to approximately $2 billion) Massachusetts created in 2008 – have put forth to attract investment. The Massachusetts Life Sciences Center is widely thought of as the gold standard in life sciences state government support. But other states are jumping on board – at the end of 2022, the New Jersey Economic Development Authority completed its first sale of tax credits to fuel the New Jersey Innovation Evergreen Fund. The first-round funding pool, which was released late year, will make approximately $46 million available to New Jersey entrepreneurs and they plan to have the state become an equity investor in startups by deploying $600 million total alongside professional venture capital groups.

This kind of early-stage company support is helpful and noticed by investors. By comparison, the only direct support the state offers early-stage life sciences companies is the $3 million – one million each – that goes to the state's three life sciences greenhouses. A program that was created more than 20 years ago under the tobacco settlement agreement.

Even relatively "small" efforts, such as creating an SBIR Matching program (currently offered by 27 other states), an Angel Investor Tax Credit (offered by at least 21 states), and allowing associations such as ours to operate association health plans (offered by at least 30 other states) will help small companies allocate more resources to support their R&D efforts and build upon the strong foundations I previously outlined.

That is why conversations like this one are so helpful to generating new ideas and policies that can forge a path forward for Pennsylvania's growth.

There are Senators participating in today's hearing from across the Commonwealth and it's important to note these developments are not just confined to Philadelphia . Life sciences activity tends to be most heavily concentrated around these cities, but there are many projects throughout Pennsylvania that will benefit from this investment. Projects like…

- A medical device manufacturer that just completed a $200 million expansion at its facility in Allentown. (B. Braun)
- A designer and manufacturer of packaging and delivery systems for injectable medicines that is investing $60 million and creating 225 new jobs at a facility in Lycoming County. (West Pharmaceutical Services)
- A water purification company expanding its footprint (Purolite) in southern Chester County with a new, $190 million biologics resin manufacturing facility. (EcoLabs)
- A worldwide leader in lab supplies that is expanding its Millersburg facility with a $40 million investment in its manufacturing of critical materials used in developing new and existing biologics and vaccines. (Thermo Fisher Scientific)

Those are all larger projects but are indicative of the robust ecosystem Pennsylvania and Pennsylvanians enjoy. They're also the type of significant, long-term capital investments borne out of supporting early-stage companies in this sector and the ecosystem more broadly.

Life Sciences PA and its member organizations are happy to be a resource to you and look forward to working with this Committee, the General Assembly and Governor's administration on policies that support Pennsylvania's innovation economy.

Christopher P. Molineaux
President & CEO
Life Sciences Pennsylvania

THE CHAMBER
of Commerce for Greater Philadelphia

Testimony
of
Anselm Sauter
Vice President, State and Regional Affairs
Chamber of Commerce for Greater Philadelphia

Pennsylvania Senate Majority Policy Committee
Thursday, April 11, 2024

Thank you for the opportunity to submit testimony to illustrate the Commonwealth of Pennsylvania's unique position as a leader in innovation.

The Chamber of Commerce for Greater Philadelphia is committed to regional development, promoting business-friendly public policies, and fostering economic prosperity. Our core mission is to create a thriving business environment that champions economic inclusion, enhances regional improvements, and empowers talent initiatives, all with the ultimate goal of making Greater Philadelphia an outstanding place for businesses to thrive.

Last September, our Chamber testified before this Committee at the Pittsburgh Technology Council to illustrate Pennsylvania's economic potential due to its rich innovation assets. These include world-class anchor institutions, robust research and development inputs, and a diverse pool of top-tier talent. While these assets ranging across a wide array of sectors position Pennsylvania as a leader in innovation, more must be done to translate them into thriving enterprises. Without focused public-private efforts, we risk losing companies emerging from our academic institutions and dynamic R&D ecosystems to states elsewhere.

Pennsylvania's standing as an innovation leader is particularly pronounced in the life sciences sector here in southeastern Pennsylvania. Groundbreaking research in gene therapy and cell therapy was pioneered in the Greater Philadelphia region over two decades ago, leading to the development of the first FDA-approved gene therapy and first FDA-approved cell therapy. Our region is the birthplace of these novel therapies. It is paramount that we capitalize on successes like these and others.

In 2017, the Brookings Institution released a report which pushed our region to action when it suggested that local leaders could collectively address some of the greatest impediments to Greater Philadelphia's global competitiveness by collaborating and coordinating at scale. In response, our Chamber developed a private sector-led and funded action plan aimed at leveraging Philadelphia's precision medicine sector, particularly our cell and gene therapy assets, as a potential catalyst for regional economic transformation.

This initiative included deep stakeholder engagement and harnessed the collective prowess of industry leaders to harness our community's standing as a global leader in these emerging disciplines of cell therapy, gene therapy, and gene editing. The multi-year effort aimed to share the narrative of the region's assets, support emerging and scaling companies, address the talent needs of the industry; and catalogue the specialized infrastructure needed for growth.

Today, Greater Philadelphia boasts over 60 companies engaged in cell and gene therapy research and development, a substantial increase from 30 companies in 2019, with continued interest in expanding operations within the region. Over the past five years, the Chamber, in collaboration with the Commonwealth of Pennsylvania and other regional partners, has supported more than 418 business expansion projects, with nearly 45% of these projects occurring within the life sciences sector. Our efforts continue to fuel interest in our region which have also contributed to life sciences conventions and meetings being 40% of the business at the Pennsylvania Convention Center and often inspire long-term business opportunities. We see first-hand how collaborative, cross-sector, and inter-governmental efforts can produce tangible results.

The momentum in sector growth and regional interest persists, underscored by several factors that position the region for present and future success. Notably, in the Chamber's 2022 comparative analysis, Greater Philadelphia ranked second out of 14 hubs in the United States engaged in cell and gene therapy sectors. The proximity to research institutions and access to a talented workforce serve as pivotal competitive advantages for our region. Furthermore, our recent designation as a Tech Hub for Precision Medicine led by Ben Franklin Technology Partners of SEPA contributes to our growth trajectory, attracting additional funding and businesses to our region.

Equally exciting is the non-degreed talent that our region is beginning to develop. Since 2019, the Chamber has convened a table of cell and gene therapy employers who have been willing to collaborate on shared talent solutions. As a result of their collaboration, we have seen the launch of multiple training programs focused on preparing adults for high-quality roles at those regional life sciences companies over the last 18 months alone. From the employer-customized programs between Wistar/West Philadelphia Skills Initiative with Iovance or Vintabio, and the Community College of Philadelphia with WuXi Advanced Therapies, opportunities for non-degreed talent are being realized. With successful youth and adult career exposure programs being offered by the University City Science Center and Philadelphia Education Fund, we are building a pipeline that will remain robust into the future. And these are just a handful of examples among many developed across the community.

All of these efforts will be further amplified through the recent regional collaborations that have come together to pursue large federal grant opportunities, including our area's successful application to the U.S. EDA's Good Jobs Challenge, spearheaded by Philadelphia Works. The funding secured through this initiative catalyzed the creation of the Keystone Life Sci Collaborative which is being led by a diverse core team comprising the Chamber of Commerce for Greater Philadelphia, West Philadelphia Skills Initiative, The Wistar Institute, Montgomery County Community College, and Life Sciences Pennsylvania. The stakeholders in the Keystone Life Sci Collaborative will work together to address key challenges over the next 3 years in hopes to provide equitable economic opportunities for everyone in Greater Philadelphia.

The success and growth of the life sciences industry in Pennsylvania is not exclusive to Greater Philadelphia, nor is life sciences the only sector that is primed for growth. Pennsylvania enjoys several strong sectors, including robotics, energy, agriculture, and defense, where it holds a unique competitive advantage over other areas of the country. Lawmakers should focus policies and investments that will

support the growth and expansion of these industries or otherwise risk falling behind competitor states including Massachusetts, New York, Ohio, and Indiana, all of which have recently committed $1 billion or more to their innovation economy.

Our Chamber has called on lawmakers to enact bold public-private sector innovation economy strategy that would leverage and scale Pennsylvania's existing strengths and build capacity in a state-wide, multi-industry innovation ecosystem. We believe the creation of a fast and flexible innovation fund could support and scale the development of diverse talent and career pathways across the innovation ecosystem; accelerate research, commercialization and manufacturing activity; and promote Pennsylvania's identity and narrative among a national and global audience.

The Chamber of Commerce for Greater Philadelphia is unwavering in our commitment to fostering regional collaboration and innovation that will unlock the full potential of growth in our region and state. We are eager to continue collaborations with you and your colleagues to advance this shared vision of inclusive and sustainable growth.

Thank you.