



Biotechnology
Innovation
Organization



BIOSCIENCE INNOVATION IN THE STATES: LEGISLATION AND JOB CREATION THROUGH PUBLIC-PRIVATE PARTNERSHIPS

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ECONOMIC DEVELOPMENT

Trends of 2015–2016

Advances in biotechnology innovation have had an enormous transformative impact on many sectors of the U.S. economy — life-saving drugs for patients of all ages, protecting plants that are key to feeding the world and industrial biotechnology applications that are leading to bio-based fuels, chemicals and products that can protect our environment.

The bioscience's need for a stable and supportive public policy framework is vital to industry firms large and small. It is almost impossible for any state or region to ignore the need for selective incentives to either hold existing bioscience companies or attract new enterprises.

Through continuing interactions on multiple levels, state lawmakers have become increasingly aware of the unique challenges facing bioscience companies such as the high cost and the length of time involved in the development of new bioscience products. They understand the importance of a stable and supportive business climate for small and emerging companies.

This 2017 biennial state legislation best practices guide therefore reports on select state legislative efforts that focus on ways to support company creation, expansion, and attraction strategies in an increasingly competitive environment both in the US and elsewhere.

For a decade and a half, the bioscience industry has been a leading performer for the U.S. economy. The industry has grown its employment base by nearly 10% or 147,000 jobs since 2001. Bioscience job growth has been more rapid compared not only against the overall private sector, but also against other U.S. knowledge- driven, technology based sectors such as finance and insurance, aerospace, and computer hardware.

Key findings from the 2016 TEconomy/BIO assessment of the industry's performance include:

- The bioscience industry employed 1.66 million people across more than 77,000 U.S. business establishments.
- Overall industry employment has increased for 4 consecutive years, and in 2016 all five of the major industry subsectors grew.
- The industry continues to pay high wages, reflecting the high skills and education requirements of an innovative workforce, with the average U.S. bioscience worker earning nearly \$95,000 per year, or 85 percent greater than the private sector average. Since 2001, bioscience wages have grown substantially faster than overall private sector wages.
- From 2012 through 2014, 35 states experienced net job growth in the biosciences.
- The bioscience industry is well distributed geographically, and diverse in the niche strengths that span the nation's states and cities. Among all U.S. states, 32 states and Puerto Rico have an employment specialization in at least one bioscience subsector. For U.S. metropolitan areas, also featured in this report, 222 of 381 have at least one specialization.

“Our state is proud to lead the way and we are committed to doing everything in our power to continue to lead. Our goal is for Maryland to be a leader in entrepreneurship, a leader in innovation and next generation technology, and a leader in ground-breaking research and discovery that addresses some of the greatest medical mysteries of our time. We are incredibly proud of the life-saving and life-changing work that is being done in our state ... We’re incredibly proud to be home to a growing, thriving life sciences industry... The life sciences industry has a friend in the governor’s office and a tireless advocate that will be fighting on your behalf each and every day.”

*Governor Larry Hogan
Maryland, April 18, 2016*

The following select state economic development measures continue to represent the substantial level of support so vital growth of the bioscience industry.

16 states offer matching grants for Phase I and II Small Business Innovation Research (SBIR) grants to accelerate early stage company development.

25 states offer tax credits to angel investors who invest in technology companies including the biosciences.

38 states offer sales tax exemptions on equipment for both research and development (R&D) and manufacturing with several exemptions specifically for biomanufacturing.

21 states invest state dollars in private venture-capital firms that fund small and emerging bioscience companies.

38 states offer R&D tax credits for early stage research that is vital in moving research into commercialization.

“Massachusetts leads the nation in the development and deployment of advanced manufacturing technologies, and this new biopharmaceutical manufacturing innovation institute will ensure that our globally competitive life sciences cluster continues to deliver cutting-edge therapies, while providing quality manufacturing jobs to the citizens of Massachusetts.”

*Governor Charlie Baker
Massachusetts, December 19, 2016*

TRENDS

for Continued Growth

Public policy makers and other stakeholders worked to enact legislation over the past two years. An analysis of those efforts reveal the following trends in state economic development.

States Respond to Funding Hurdles

There is a growing recognition among state policy makers that biotechnology innovation can help to solve some of the healthcare, agricultural and industrial problems that are present in America, particularly if early stage funding for emerging bioscience companies is available. Policy makers have increased their support for the biosciences through more targeted legislation to increase available funding, particularly for emerging companies in their state.

Smaller Metropolitan Areas are Gaining Ground

Lower overall costs of occupancy, coupled with academic resources and an educated work force, continue to attract companies to locations outside the nation's largest metro areas. Even with industry consolidation, companies are driving a steadily increasing demand for space in life sciences-oriented facilities, keeping space occupied and rents stable.

Smaller states that have not traditionally invested in building their bioscience base are beginning to do so.

It appears that activities in states with smaller bioscience R&D bases have been spurred, in part, by their participation in NIH's Biomedical Research Infrastructure Network (BRIN) and IDeA Network of Biomedical Research Excellence (INBRE) programs.

Proximity to Academic Innovation is a Driving Influencer

Academic research anchors offer distinct features including the scale of their operation, their extensive collaborations with other research institutions and their multi-disciplinary approach that integrates complementary technologies to create a focus in a broad-based area of the biosciences. This broad foundation promotes both sustainability and flexibility in a rapidly changing bioscience universe.

New partnerships that integrate entrepreneurship and industry involvement into the university research experience facilitate the path from research to commercialization and help innovative ideas reach the marketplace.

Workforce: An Essential Priority for Industry and State Government

State governments and regional economic development agencies are continuing to respond to bioscience industry needs for a well-trained workforce in all phases of bioscience testing and manufacturing. Those partners, in cooperation with the industry, have established bioscience workforce initiatives across a range of the educational spectrum, including:

- Establishing biomanufacturing technician two-year associate's degree programs;
- Offering new master and doctoral level programs in the bioscience field, and;
- Determining skill training and education needs through regular and continuing outreach to bioscience companies.

States and regions are focusing activities on developing their agricultural, industrial and environmental bioscience sectors in addition to their biomedical and health sectors.

After two decades of approval for biotechnology medicines, the first biotechnology-enhanced crop entered the marketplace. Now, scientists are using bioscience technologies to improve manufacturing processes, chemical synthesis and production and a number of states and regions are focusing on the opportunities this presents for their economies.

States and regions across the nation are focusing on how to leverage their growing base of academic and medical research facilities to create a physical environment that can be supportive of, and a magnet for, bioscience companies.

In particular, a new wave of strategically planned "mixed use" campus expansions are taking place across major research universities in communities across the country from Raleigh, Seattle, Portland (Oregon), New York City, Denver, Chicago and San Francisco. States are also creating Smart Zones (MI), Innovation Zones (NJ and PA) and Technology Zones (IN, NY, WI) around universities and medical complexes that contain incubator and multi-tenant space and provide incentives for start-up companies.

Defining the **BIOSCIENCES**

The Bioscience industry uses the knowledge of living organisms or other biological systems in the manufacturing of innovative products that address health, agricultural and environmental challenges. This diverse industry spans many markets and includes manufacturing, services, and research activities.

Whether the industry is called biotech, biosciences, or the life science industry, its diversity in scientific discovery and commercialization is defined by the application of biological knowledge.

In collaboration with BIO, TEconomy Partners identified five major sectors of the biosciences that reflect the size and diversity of this growing technology sector.

- **Agricultural Feedstock and Chemicals:** Industries that utilize advances in biochemistry and biotechnology to produce products involved in crop protection, advanced seed, agricultural processing, bio-fuels, biodegradable materials from plant-based feedstock, sustainable industrial oils and lubricants, and enzymes and bio-based catalysts for industrial processes.
- **Drugs and Pharmaceuticals:** Industries that produce vaccines, biopharmaceuticals, tissue and cell culture media.

- **Medical Devices and Equipment:** Industries that produce a variety of biomedical products such as surgical instruments, orthopedic implants, bioimaging equipment, dental instruments and patient care products (such as walkers, wheelchairs and beds.)
- **Research, Testing and Medical Laboratories:** Emerging companies working to develop and commercialize new drug discovery/delivery systems and gene and cell therapies, as well as more service-oriented firms involved in pre-clinical drug development, clinical trials, and research/laboratory support services. While primarily focused on human health, many companies also focus on research and testing for agriculture and veterinary uses.
- **Biosciences-related Distribution:** Industries that specialize in approaches such as cold storage and highly regulated product monitoring, and new technologies for distribution such as automated pharmaceutical distribution systems. These dedicated bioscience-related distribution industries include three unique subgroups: one associated with medical equipment and device distribution; another with drug distribution; and a third with agricultural-related chemicals and seed distribution. Each of these bioscience-related industries is becoming integral to the primary production of bioscience goods in an age of advanced logistics and the increasingly specialized nature of bioscience product development.



MATCHING BIOSCIENCE COMPANY PHASES OF DEVELOPMENT AND STATE POLICY SUPPORT MECHANISMS

Because of the lengthy commercialization timeline to success, the biosciences sector has three distinct phases of company creation and expansion. Over the past fifteen years, BIO, with the assistance of its member companies, has identified key enabling types of legislation to support emerging, testing, and manufacturing companies in our technology sector. This chart characterizes those phases of development and essential legislative support mechanisms needed by these companies.

Emerging Companies

Early-Stage Development.

It is at this stage that company researchers identify the action mechanisms of the lead compound or diagnostics tool and develop protocols to begin verifying the viability of the discovery with early testing on in vitro media. Many of these companies can focus on developing products for markets that would otherwise not be served by larger organizations. Typically these companies have no products on the market, less than 100 employees, and are funded by Angel and Venture Capital supporters.

Foundational Legislative Enablers:

- SBIR/STTR Small Business Technology Match Funding
- Angel Investor Tax Credit
- Seed Capital Tax Credit
- Incubator/Accelerator Funding

Testing Companies

Mid-Stage/Product Development.

Once the technical viability of a discovery has been established, the target product must be developed. This stage of company development typically requires significant investment in personnel, equipment and facilities. These companies generally have less than 200 employees and have products in Phase I FDA safety trials.

Late-Stage/Regulatory Review and Approval.

Clinical trials are required to show that products are both safe and effective. Clinical research contractors are often retained. In the case of biopharmaceuticals, pilot-scale manufacturing facilities must be built or contract manufacturing capacity must be secured, along with the necessary scientific, engineering, operating, and maintenance personnel. Small quantities of the product must be produced for testing.

Foundational Legislative Enablers:

- Net Operating Losses (Carry-Over, Transferability)
- Research and Development Tax Credits
- Capital Investment Tax Incentives
- Innovation Investment Tax Incentives

Manufacturing Companies

Mature/Manufacturing/Marketing and Sales.

In this stage, the company manufactures commercial quantities of its approved product, creates a sales force or licenses product to another company. Sale of manufactured products produces revenues and, hopefully, profits. Traditional sources of financing, such as commercial loans and public stock offerings, may become viable.

Foundational Legislative Enablers:

- Site and Infrastructure Grant Funds
- Renewable Energy Tax Credits
- Road Access and Rail Access Programs
- Sales and Use Tax Discounts, Exemptions and Refunds
- Utilities Rebates

Strategic Policy INITIATIVES

State governments and regional economic development organizations have increasingly begun to target the bioscience industry because it is an economic engine that provides high wage, high-skilled jobs across a broad range of occupations.

During the last decade, this understanding of the economic potential of the industry has led to policies and programs that provide supportive tax environments in capital formation, technology transfer, and funding for a workforce to facilitate research, development, and manufacturing.

The charts on the following pages demonstrate the extent to which state governments are targeting and supporting the industry for economic growth and development.

State Supportive Tax Priorities

- Research and Development Tax Credits
- NOL Carry-forwards
- Tax Credit Transferability
- Sales and Use Tax Exemptions
- Creation of Capital Access Funds
- State Pension Fund Investment
- Capital Gains Tax Reductions
- Investment Tax Credit
- Developing Incubator/ Shared Research & Manufacturing Facilities
- Workforce Development Programs

Small Business Innovation Research Matching Grants Specific to Biosciences

Nineteen states match various SBIR phases of development research.

State	SBIR Funding Focus/Bioscience Specific	Legislative Program Title
CO	For SBIR Phase I	
CT	Targeted toward manufacturers	Small Business Innovation and Diversification Program
DE	For SBIR Phase I	Small Business Innovation Research
FL	Requires a university partnership	Florida High Tech Corridor Phase II SBIR/STTR External Investment Program
FL	For SBIR Phase I and II	Florida Research Commercialization Matching Grant Program (currently closed)
HI	For SBIR Phase I	Hawaii Small Business Center
IA	For SBIR Phase I	
IN	For SBIR Phase I	Indiana 21st Century Research and Technology Fund
KS	Not exclusive to SBIR but still of interest	Kansas Bioscience Matching Fund
KY	For SBIR Phase I and II	Kentucky SBIR-STTR Matching Funds Program
MA	For SBIR Phase II	Small Business Matching Grant Program at Mass Life Sciences Center
MI	Only for commercialization purposes; for Phase I and II	Michigan Emerging Technologies Fund
MT	For SBIR Phase I	
NC	For SBIR Phase I (no funding for current year)	Phase I Matching Funds Program
OK	For SBIR Phase I	SBIR Phase II Matching Funds Program
PR	For SBIR Phase I	Puerto Rico Science and Technology Research Trust Program
SC	For SBIR Phase I	SC Launch SBIR/STTR Phase I Matching Grant Program
VA	For SBIR Phase I and II	Also STTR Phase I and II
WI	For SBIR Phase I	

Source: PMP Public Affairs Consulting 2017

“New York is uniquely positioned to become a global powerhouse in the life science sector and this groundbreaking initiative is making the investments and establishing the programs necessary for capitalizing on our tremendous potential. From providing the incentives to attract top talent and drive innovation, to providing the space that emerging life science companies need to grow, we are breaking down barriers and helping the industry gain momentum. Now, the Empire State is well-positioned to be the home of future discoveries that will move our economy forward and save lives across the world.”

*Governor Andrew Cuomo
New York, December 12, 2016*

State Tax Credits to Encourage Early-Stage Investment

States also use tax policies to encourage private investment in early-stage companies and/or in funds that make early-stage investments. Twenty-two states offer tax credits to angel investors who invest in technology companies, eight of which are targeted specifically to angel investors who invest in bioscience companies. Eleven states reported providing tax credits to individuals who invest in early-stage venture funds.

State Tax Credits Provided to:				
State	Angel Investors	Bioscience Angel Investors	Investors in Early-Stage Venture Funds	Investors in Bioscience Early-Stage Venture Funds
CO	■			
CT	■	■		
GA	■			
HI	■			
IN	■			
IA	■		■	
KS	■	■		
KY	■		■	
LA	■			
ME	■		■	
MD	■	■		
MN	■			
MT	■		■	
NJ	■	■		
NM	■	■	■	■
NY	■			
NC	■	■		
ND	■		■	
OK	■		■	
OR			■	
PR			■	
RI	■			
VA	■	■		
WV			■	
WI	■	■	■	■

Source: PMP Public Affairs Consulting 2017

State Sales Tax Exemptions to Support the Growth of Bioscience Companies

Thirty-eight states reported exempting sales tax for equipment used in R&D, and thirty-six states reported exempting equipment purchased for biomanufacturing from sales tax. Eleven states have sales tax exemptions specifically targeted to bioscience firms.

State	State Sales Tax Exemptions to Support the Growth of Bioscience Companies	Specifically Targeted to Bioscience	Sales Tax on Equipment Purchased for Biomanufacturing
AZ	■		■
CA	■	■	■
CO	■	■	■
CT	■	■	■
FL	■		■
GA	■		■
HI	■		■
IL	■		■
IN	■		■
IA	■		■
KS	■		■
KY	■		■
LA	■		■
ME	■		■
MD	■		■
MA	■		■
MI	■		■
MN	■		■
MS	■		■
MO	■	■	■
NE	■		■
NV	■		■
NJ	■	■	■
NM	■	■	■
NY	■		■
NC	■	■	■
ND	■		■
OH	■		■
PA	■		■
PR	■	■	
RI	■	■	■
SC	■		■
SD	■		■
TX	■		
UT	■	■	■
VA	■		■
WA	■		■
WI	■	■	■

Source: PMP Public Affairs Consulting 2017

Funds of Funds to Increase the Availability of Venture Capital

States also use tax credits to increase the availability of venture capital. They can create funds that make investments directly in companies, invest in privately managed funds that agree to invest in state companies; or create a fund that in turn invests in private venture-capital funds, which is referred to as a “fund of funds” if it involves more than one fund. As of 2016, eleven states reported investing in a fund of funds, ten states reported investing state dollars in private venture capital firms and fourteen states reported making direct investments in bioscience companies.

State	Invested in Fund of Funds	Invested in Private VC Firms	Invested in Bioscience Companies	Other
DE	■	■	■	Appropriated funds for contract with private nonprofit to provide funding for companies
HI				
IL	■	■	■	
KS			■	
KY	■	■	■	
MA			■	Through Massachusetts Technology Development Corporation
MD		■		
MI	■			
MT	■			
NJ	■	■	■	
NM	■	■	■	
NC	■	■		
OH			■	
OK	■		■	
OR	■			
PA		■	■	
RI			■	
SD			■	Provides financing for feasibility studies in the form of a forgivable loan
TN		■		
VA			■	
WI	■	■	■	

Source: PMP Public Affairs Consulting 2017



State R&D Tax Credits

Thirty-eight states reported offering R&D tax credits, an increasing number of which offer a larger credit if the research is conducted by an in-state university. R&D tax credits are refundable in eleven states and transferable in five.

State R&D Tax Credits	R&D Tax Credit	Transferable	Refundable	Comments
AR	■	■	■	
AZ	■			
CA	■			
CO	■			
CT	■		■	
DE	■		■	Companies receive the full R&D tax credit for which they qualify by removing the annual expenditure cap of \$5 million for the R&D tax credit.
GA	■			
HI	■		■	
ID	■			
IN	■			
IA	■		■	Refundable tax credit is equal to 6.5% of qualified expenditures and it may be increased for bioscience firms participating in the High Quality Jobs Programs
KS	■			
KY	■			
LA	■		■	
ME	■			
MD	■			
MA	■		■	Refundable if company creates more than 10 jobs and applies to Massachusetts Life Sciences Center (MLSC)
MN	■			
MS	■			R&D Jobs Credit
MT	■			
NE	■	■	■	
NH	■	■		
NJ	■	■		In FY 2012 the R&D Tax Credit was increased from 50% to 100%. Allows eligible technology and life sciences companies to sell unused New Jersey net operating losses and R&D credits to unrelated profitable corporations.
NM	■			
NC	■			
ND	■			
NY	■		■	
OH	■			
OR	■			
PA	■	■		
PR	■	■		The R & D Credits is 50% (non incremental without a base amount of the qualify eligible expenses.
RI	■			The R&D tax credit has a carry forward of 14 years
SC	■			
TX	■			
UT	■			
VA	■		■	
WV	■		■	Investment Credit
WI	■			

Source: PMP Public Affairs Consulting 2017

Capital Formation INITIATIVES

While it is critical to have financing available for each stage of development including early-stage, proof-of-concept and prototype development, a state or region must also be able to access national and regional venture capital pools as bioscience firms mature and move closer to the market. In short, leading states and regions address a continuum of capital needs from prototype through seed to later stage formal venture financing.

CONNECTICUT

In 2016, the state legislature passed SB 401 (now PA 16-204), to expand the eligibility for funds from the Connecticut Bioscience Innovation Fund and expand how the returns on such funds can be invested. This bill allows Connecticut Innovations Inc. (CI) to use its unrestricted funds and funds in the Connecticut Bioscience Innovation Fund (CBIF) to invest in private equity investment funds under certain conditions. (The Connecticut Bioscience Innovation Fund, a \$200M, 10-year, evergreen fund via the State Bond Commission, was originally signed into law in 2013.)¹

DELAWARE

The Delaware Bioscience Center for Advanced Technology (Bioscience CAT) is a State of Delaware-funded program facilitated by the Delaware Biotechnology Institute (DBI) to support collaborations between life scientists in academia and industry, thereby encouraging innovation and economic development in the state. There are now three components to the Bioscience CAT: (1) Entrepreneurial Proof of Concept grant program, offering awardees up to \$50,000 for life sciences research that results in a new start-up in Delaware by the close of the 12-month grant period; 2) Applied Research Collaborations grants, providing up to \$75,000 for single-investigator projects and as much as \$100,000 for two-investigator projects; and 3) Technology Access Program, which allows Delaware bioscience companies access and a reduced cost to use high-end technology as part of the DBI network.²

MASSACHUSETTS

In January 2017, the Massachusetts Life Sciences Center (MLSC) launched a new grant to provide funding to early-stage life sciences companies. The Massachusetts Ramp-Up Program (MassRamp) will provide supplemental grant funding to companies that have been awarded Small Business Innovation Research (SBIR) or Small Business Technology Transfer (STTR) Phase I grants or contracts from federal agencies. The Center will provide awardees a grant of up to \$300,000 to help early stage companies cover the costs of direct labor, clinical trials, consultants and subcontractors, materials, supplies and equipment.³

“Arizona’s bioscience and healthcare industries’ efforts to discover, develop, and deliver the life-saving and life changing innovations makes life better today and for future generations. These innovations support our economic health as well – providing the opportunity for high-wage, high quality careers.”

*Governor Doug Ducey
Arizona, September 16, 2016*

¹ “An Act Concerning the Connecticut Bioscience Innovation Fund and Investments by Connecticut Innovations Incorporated.” Public Act. No. 16-204. <https://www.cga.ct.gov/2016/ACT/pa/2016PA-00204-ROOSB-00401-PA.htm>

² <http://www.delawarebio.org/delaware-biotechnology-institute>

³ “Massachusetts Life Sciences Center announces launch of Massachusetts Ramp-Up Program.” MLSC website. January 31, 2017. <http://www.masslifesciences.com/wp-content/uploads/MASSRamp-Announcement-Release-FINAL-1.31.17.pdf>

“Nebraska has a powerful resume to attract these types of companies. Now, we have to get out there and pound the pavement. The bioscience industry is growing very rapidly as technological advances make way for innovative products and uses. We want to be positioned for more growth in this area and let companies know Nebraska is open for business.”

*Governor Pete Ricketts
Nebraska, June 15, 2015*

MINNESOTA

In 2016, the Minnesota legislature provided \$594,000 for the Working Lands Watershed Restoration Program plan and feasibility study. This program lays the groundwork for creating a state-funded biofuels incentive program from perennial feedstock instead of corn.⁴

NEBRASKA

The Nebraska legislature in 2017 passed a bill that created a bioscience-specific program within the Nebraska Business Innovation Act. The bill provides matching financial assistance to help form small enterprises, create high-wage jobs, develop new technologies, spawn innovation and help grow Nebraska's bioscience industry. The bill's sponsor said there would be no fiscal impact on the state tax-supported general fund.⁵

NEW YORK

In late 2016, New York Governor Andrew M. Cuomo proposed a \$650 million initiative to spur the growth of a new, world-class life science research cluster. The initiative includes \$250 million in tax incentives for new and existing life science companies, \$200 million in state capital grants to support investment in wet-lab and innovation space, \$100 million in investment capital for early stage life science initiatives, with an additional match of at least \$100 million for operating support from private sector partnerships.⁶

“It wasn't too long ago that the sum total of economic development was the deal. Now, especially for biotech, we have to create the broader environment that is conducive to entrepreneurial activity, research, innovation. That includes investment in schools, a state that can pay its bills and have a fair tax system.”

*Governor Tom Wolf
Pennsylvania, June 17, 2015*

⁴ “A Biomass Bright Spot from the 2016 Minnesota Legislative Session.” Great Plains Institute website. June 10, 2016. <http://www.betterenergy.org/blog/biomass-bright-spot-2016-minnesota-legislative-session>

⁵ “Bioscience innovation funding support urged.” *The Lincoln Journal Star*. March 6, 2017. http://journalstar.com/legislature/bioscience-innovation-funding-support-urged/article_7e93aaf4-182a-50c0-b2dd-cc5c0c1b0570.html

⁶ “Governor Cuomo Announces Groundbreaking \$650 Million Initiative to Fuel Growth of a World-Class Life Science Cluster in New York.” Press release. December 12, 2016. <https://www.governor.ny.gov/news/governor-cuomo-announces-groundbreaking-650-million-initiative-fuel-growth-world-class-life>

Workforce AND TALENT POOL

Like any knowledge-based industry, bioscience companies need a strong supply of qualified, trained workers. To meet the demands of newly emerging fields, new curricula and programs are being developed by educational institutions working in close partnership with the bioscience industry. In addition to having worldclass researchers, successful bioscience regions have an adequate supply of management, sales, marketing, and regulatory personnel experienced in the biosciences. Funding bioscience workforce initiatives across the educational spectrum is essential.

COLORADO

In 2016, Colorado enacted the Industry Infrastructure Grant Program (HB16-1288) to develop and maintain industry competency standardization to support businesses in their implementation of work site training programs. The act creates the industry infrastructure fund to pay for the program. The fund consists of \$900,000 transferred over 3 years from the general fund and any other gifts, grants, or donations that the state work force development council receives.⁷

In 2015, Colorado passed the Innovative Industries Workforce Development Program (HB 15-1230), which provides the Colorado Department of Labor and Employment funding for 90 internships annually for five years, to distribute matching grants up to \$5,000 per intern for on-the-job training at participating companies. A business may be reimbursed for up to five interns per location. Internships require a minimum of 130 on-the-job training hours and must be completed in less than six months. The program is limited to bioscience and 7 other industries.⁸

GEORGIA

The Georgia Bioscience Training Center opened in September 2015. The training center is owned by the state of Georgia and operated by Georgia Quick Start, a division of the Technical College System of Georgia.⁹

MASSACHUSETTS

In August 2016, Governor Charlie Baker signed a new economic development law that included funding for new grant program for workforce development training equipment. The \$45 million Workforce Skills Capital Grants program provides technical and scientific equipment to vocational schools, community colleges and public high schools.¹⁰

Governor Charlie Baker's proposed budget for FY2018 includes \$4 million for a new "Learn to Earn" initiative, which would offer training assistance to unemployed and underemployed individuals around high-demand (STEM) fields.¹¹

⁷ HB16-1288: Industry Infrastructure Grant Program. <https://leg.colorado.gov/bills/hb16-1288>

⁸ "Internship Program to help shape the future of Colorado's Innovative Industries." February 9, 2016. <https://www.colorado.gov/pacific/cdle/news/internship-program-help-shape-future-colorados-innovative-industries>

⁹ "Deal opens bioscience training center in Newton County." Press release. September 10, 2015. <http://www.georgia.org/newsroom/press-releases/deal-opens-bioscience-training-center-in-newton-county/>

¹⁰ "Governor Baker Signs Economic Development Legislation: \$1 billion initiative will advance community development, workforce training, and innovation." Press release. August 10, 2016. <http://www.mass.gov/governor/press-office/press-releases/fy2017/governor-baker-signs-economic-development-legislation.html>

¹¹ "Gov. Baker pushing program aimed at expanding job training." *The Boston Globe*. January 25, 2017. <https://www.boston.com/news/politics/2017/01/25/gov-baker-pushing-program-aimed-at-expanding-job-training>



NORTH CAROLINA

In 2015, the GoldenLEAF Foundation awarded \$1.75 million in grants to East Carolina University and Pitt Community College to develop the North Carolina Pharmaceutical Services Network.

- The Pharmaceutical Services Center at East Carolina University (ECU) is developing a laboratory-based education and training network for the pharmaceutical industry. The PSC@ECU collaborates on projects with regional pharmaceutical companies and supplements existing workers' knowledge with useful short courses.
- The Pharmaceutical Services Center at Pitt Community college is developing an Oral Solid Dose Training Program for the pharmaceutical industry. The PSC@PCC will provide training in the theories and practices of oral solid dose manufacturing.¹²

“A skilled, professionally trained and qualified workforce is essential for Georgia to usher in a new era of bioscience industry. The BioScience Training Center is a showcase destination where biotech prospects and industry groups can see the level of support and training expertise Georgia can provide. Operated by Quick Start, the No. 1 workforce training program in the country, this first-of-its-kind training center offers companies a great opportunity to secure a qualified workforce and offers Georgians resources and support to ensure their success in these high performance jobs.”

*Governor Nathan Deal
Georgia, September 10, 2015*

¹² “Collaboration and Partnership to Establish a Pharmaceutical Powerhouse.” Pitt County Development Commission press release. March 2, 2015. <http://locateincarolina.com/news/collaboration-and-partnership-to-establish-a-pharmaceutical-powerhouse/>

INNOVATION PARTNERSHIPS: Moving Academic/Industry Innovations Forward

A strong partnership between industry, academia, and state government is essential for the development of successful bioscience clusters. As states evaluate how to continue encouraging bioscience companies to locate within their borders, they need to review their tax and investment structure incentives in the area of capital acquisition, workforce preparedness/training, and physical infrastructure to help companies through all phases of product development and manufacturing. Through supports for industry-university collaborations, provision of R&D tax credits, business incubator development, risk-capital supports, and other innovation support mechanisms, states and metro regions are able to enhance their attractiveness for bioscience projects and increase the creation and growth of new bioscience companies.

CALIFORNIA

In March 2017, UC Berkeley's Energy Biosciences Institute entered a 5-year, \$25 million research partnership with Shell. The partnership will pursue fundamental research in the areas of solar energy transformation, advanced energy storage and novel synthesis routes to create new products, and to leverage new capabilities in computational material science and biosciences and bioengineering. EBI's research focus has been on enabling feedstock availability.¹³

In April 2015, Governor Jerry Brown launched the California Initiative to Advance Precision Medicine, led by the University of California with an initial \$3 million commitment from the state. Hosted at UC San Francisco, the initiative will cross-reference privacy-protected patient data across the UC health care system, including five UC medical centers, with clinical trial data, genomic, environmental, socioeconomic and health patterns and mobile technologies.¹⁴

CONNECTICUT

In 2015, BioInnovation Connecticut announced that it would invest \$10 million in a collaboration between UConn and Yale called Program in Innovative Therapeutics for Connecticut's Health, or PITCH. Funded through the Connecticut Bioscience Innovation Fund, PITCH is a cross-university collaboration focused on commercializing bioscience discoveries.^{15,16}

"We are taking Connecticut into the future by investing in – and committing to – bioscience, and this collaboration will boost the number of discoveries coming from our state. We look forward to seeing the discoveries that come from the steps we've taken and the program in the future."

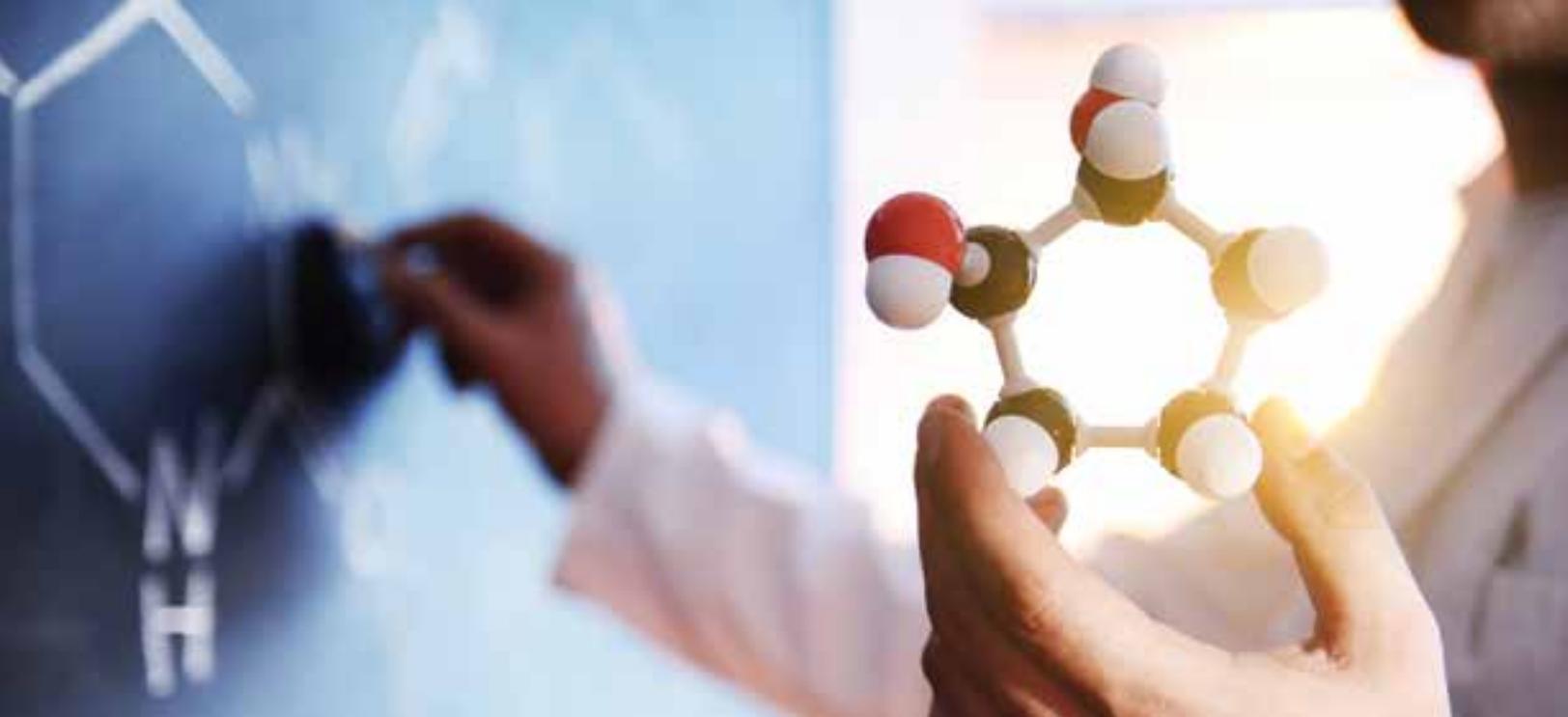
*Governor Dannel P. Malloy
Connecticut, September 11, 2015*

¹³ "EBI, Shell sign \$25 million partnership to fund new energy tech research." *Berkeley News*. March 15, 2017. <http://news.berkeley.edu/2017/03/15/energy-biosciences-institute-shell-partnership/>

¹⁴ "New 'Google Maps for health' drives California to precision medicine lead." *San Francisco Business Times*. April 14, 2015. <http://www.bizjournals.com/sanfrancisco/morning-call/2015/04/precision-medicine-uc-jerry-brown-google-goog.html>

¹⁵ "Breaking silos: the big 'C' in CT's bioscience ambitions is collaboration." *Hartford Business Journal*. April 11, 2016. <http://www.hartfordbusiness.com/article/20160411/PRINTEDITION/304079923>

¹⁶ "Connecticut Bioscience Innovation Fund Invests \$10 Million in Program in Innovative Therapeutics for Connecticut's Health (PITCH)." September 11, 2015. <http://entrepreneurship.uconn.edu/2015/09/11/connecticut-bioscience-innovation-fund-invests-10-million-in-program-in-innovative-therapeutics-for-connecticuts-health-pitch/>



DELAWARE

In December 2016, US Department of Commerce announced that the University of Delaware would serve as the home of the National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL), a public-private partnership of universities, companies and other organizations across the US. The Delaware Biotechnology Institute spearheaded the application.^{17,18}

With a \$70 million federal investment and at least \$129 million from consortium members, NIIMBL's goal is to accelerate innovation in biopharmaceutical manufacturing, develop standards and measurement science for the industry, and create a well-trained workforce.

Former Delaware Governor John Markell's FY2018 budget proposal included \$2.5 million in capital funding for the NIIMBL, and new Governor John Carney's "budget reset" documents don't mention any changes.¹⁹

GEORGIA

In January 2016, the Georgia Institute of Technology launched a new research center devoted to standardizing the production and testing of living cells. The Marcus Center for Therapeutic Cell Characterization and Manufacturing (MC3M) was created with a \$15.7 million grant from the Atlanta-based Marcus Foundation and approximately \$7 million in funding from the Georgia Research Alliance and Georgia Tech. Research conducted in the center's facilities could lead to more reliable, cost-effective procedures for producing large amounts of high-quality stem cells and immune cells, which can be used in cell-based treatments for diseases like cancer, spinal cord injury, autoimmune disorders and neurodegenerative diseases.²⁰

¹⁷ Manufacturing USA Headquarters: Secretary of Commerce visit UD to announce new institute. *UDaily*. December 16, 2016. <http://www.udel.edu/udaily/2016/december/institute-innovation-manufacturing-biopharmaceuticals/>

¹⁸ "UD named headquarters of 11th institute in Manufacturing USA network." *Delaware Business Times*. December 16, 2016. <http://www.delawarebusinesstimes.com/university-delaware-named-11th-institute-manufacturing-usa-network/>

¹⁹ <http://budget.delaware.gov/budget/fy2018/index.shtml>

²⁰ "Center will develop consistent manufacturing processes for cell-based therapies." Georgia Tech website. January 19, 2016. <http://www.news.gatech.edu/2016/01/18/center-will-develop-consistent-manufacturing-processes-cell-based-therapies>

INDIANA

In February 2016, the Indiana Biosciences Research Institute received two grants totaling \$100 million to help build a 75,000-square-foot facility to call its permanent home. The Lilly Endowment donated \$80 million and Eli Lilly and Co. contributed the other \$20 million. This money augments the \$50 million the institute already raised, including a \$25 million startup grant from the state and \$25 million in private donations from local bioscience companies. The Institute, which was originally formed in 2013, aims to connect researchers at Lilly, Dow AgroSciences, Roche Diagnostics, Cook Medical and other area biosciences companies with doctors at IU Health and scientists at Indiana University, Notre Dame, Purdue and other schools.²¹

In January 2017, Governor Eric Holcomb's budget proposal included \$20 million in grants for the Indiana Biosciences Research Institute.²²

NEW HAMPSHIRE

In December 2016, the US Department of Defense announced that a public-private consortium in Manchester, NH, had won a contract to become the Advanced Regenerative Manufacturing Institute (AMRI). The Defense Department said \$80 million in federal funding and \$214 million from industry, university, nonprofit and other sources would be devoted to the effort.^{23, 24, 25}

NEW MEXICO

In March 2017, the New Mexico state legislature passed the Bioscience Development Act to create a Bioscience Authority focused on growing the industry there. The public/private partnership's members would include representatives from state research universities and legislative appointees. It's expected that one of the Authority's first tasks will be to create a Community Ready Program to help the state's communities define their resources most attractive for recruiting bioscience companies. The Bioscience Development Act did not ask for any state funding, but will be set up to receive funds from private companies, municipalities, and granting agencies.²⁶

"It's entrepreneurship and innovation...It helps create jobs from ideas. That's what it really does in simple terms," Governor Robert Bentley said, explaining both what BioAlabama does and what he has tried to do with a program called Accelerate Alabama."

*Governor Robert Bentley
Alabama, May 11, 2016*

²¹"New biosciences institute gets \$100M." *The Indianapolis Star*. February 24, 2016. <http://www.indystar.com/story/news/2016/02/24/new-biosciences-institute-gets-100m/80794292/>

²²"Holcomb Unveils Budget Proposal." *Inside Indiana Business*. January 10, 2017. <http://www.insideindianabusiness.com/story/34230301/holcomb-unveils-budget-proposal>

²³"DoD Funds New Tissue Biofabrication Manufacturing Consortium." DoD press release. December 22, 2016. <https://www.defense.gov/News/Article/Article/1036945/dod-funds-new-tissue-biofabrication-manufacturing-consortium>

²⁴300m Manchester biotech center a 'golden egg' for NH tech sector." *New Hampshire Union Leader*. December 22, 2016. http://www.unionleader.com/business/Biotech-center-a-golden-egg-for-NHtech_sector_#sthash.cyHcQGyT.dpuf

²⁵"A Millyard Transitions from Textiles to Tech." *The New York Times*. March 14, 2017. https://www.nytimes.com/2017/03/14/realestate/commercial/commercial-real-estate-manchester-millyard.html?_r=0

²⁶"If approved, bill could grow this billion-dollar industry in NM." *Albuquerque Business First*. March 28, 2017. <http://www.bizjournals.com/albuquerque/news/2017/03/28/if-approved-bill-could-grow-this-multi-million.html>

NORTH CAROLINA

In May 2015, the North Carolina Biotechnology Center launched a new grant program to fund projects that enable university researchers to explore commercial applications of their inventions. The Biotechnology Innovation Grant (BIG) program helps nurture an entrepreneurial culture within the university by pairing technologists with commercial development expertise at the earliest stages of product development. The maximum award amount is \$100,000.²⁷

In 2016, the North Carolina Plant Sciences Initiative raised \$144 million to begin building a Plant Sciences Research Complex at NC State University, where University scientists will work together with government and industry to become a hub for plant sciences innovation. Funding was raised from a variety of sources: In March 2016, North Carolina voters approved the Connect NC Bond which included \$85 million for the North Carolina Plant Sciences Initiative. In August 2016, the Golden LEAF Foundation awarded an additional \$45 million. Another \$9 million was raised from agricultural groups across the state. The State Legislature budgeted \$5 million for planning in the 2015 appropriations bill.^{28,29}

In March 2017, Governor Roy Cooper's proposed budget included funding for research commercialization initiatives including:

- \$10 million to establish the NC Invents Program to assist universities with identifying technologies with commercial potential and developing plan to make the technologies attractive to investors
- \$3.6 million to establish a Food Processing Innovation Center to be housed at the NC Research Campus
- \$4 million to participate in the new National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL)³⁰

VIRGINIA

In 2016, the Virginia Research Investment Fund (VRIF) and Committee (VRIC) were established to recruit, support and promote innovative and collaborative research, development, and commercialization efforts in projects and programs with a high potential for economic development and job creation opportunities. The state budget designated \$8 million for the VRIF in FY2017 and \$14 million in FY2018, as well as \$29 million in bonding authority in FY2017 to support the purchase of research equipment or laboratory renovations associated with researcher incentive packages and the translation of research into commercial use.³¹

In 2016, Inova Health System and the University of Virginia announced a \$112 million partnership to collaborate on research, medical education and the recruitment of eminent researchers, scientists and investigators. The Virginia General Assembly included \$28 million in funding for the partnership in its fiscal 2017-2018 budget.

²⁷ "N.C. Biotech Center's new grant to help early stage companies." *Triangle Business Journal*. May 6, 2015. <http://www.bizjournals.com/triangle/news/2015/05/06/nc-biotechnology-center-innovation-grant.html>

²⁸ "\$45 Million Golden LEAF Grant Boosts NC State's Plant Sciences Initiative." NCSU website. August 12, 2016. <https://news.ncsu.edu/2016/08/golden-leaf-grant/>

²⁹ "N.C. State wants to open \$160 million plant science complex by 2020." *Southeast Farm Press*. April 27, 2016. <http://www.southeastfarmpress.com/peanuts/nc-state-wants-open-160-million-plant-science-complex-2020>

³⁰ "FY 2017-2019 Presentation of Governor Roy Cooper's Recommended Budget." March 2, 2017. https://ncosbm.s3.amazonaws.com/s3fs-public/documents/files/2017-19_BudgetPresentation.pdf

³¹ "Virginia Research Investment Fund (VRIF) and Committee (VRIC)." State Council of Higher Education for Virginia website. <http://www.schev.edu/index/institutional/grants/va-research-investment-fund-committee>

Business Climate POLICIES

Bioscience companies need a regulatory climate and environment that encourage and support the growth and development of their industry. Tax policies that recognize the long development cycle required to bring new bioscience discoveries to the market can provide additional capital for emerging companies as well as ensure an even playing field between older, traditional industries and emerging industries such as biosciences.

FLORIDA

In 2015, Florida made significant changes to its R&D tax credit program. The total amount of research and development tax incentives were increased from \$9 million in 2015 to \$23 million for 2016.³²

IOWA

In 2016, Iowa expanded state biodiesel incentives. In addition to extending the state's Biodiesel Production Credit through 2024, the legislation also extended and expanded the Biodiesel Promotion Retail Tax Credit. The incentive will continue to provide petroleum retailers 4.5 cents a gallon on blends of at least 5 percent biodiesel (B5) through 2017. From 2018 – 2024, the B5 incentive will drop to 3.5 cents per gallon, but an additional incentive of 5.5 cents per gallon will take effect for gallons of B11 and higher.³³

MASSACHUSETTS

In August 2016, Governor Charlie Baker signed a new economic development law that included an Angel Investor Tax Credit to promote startup activity and job creation in the Gateway Cities, by incentivizing investment in early-stage life sciences and digital health firms.³⁴

RHODE ISLAND

In December 2016, Rhode Island awarded more than \$20 million in state incentives to attract Wexford Science & Technology and Cambridge Innovation Center to Providence. The first phase of the development – for a mixed-use, innovation district and life-sciences center – is estimated to cost \$158 million. The project includes a “seven-story, 191,000-square-foot Innovation Building, which will include 66,000 square feet for the CIC, a Massachusetts-based firm that provides individual and collaborative spaces for startup companies.”^{35, 36, 37}

VIRGINIA

In 2016, Virginia increased and extended the state income tax credits for R&D activities and created a new tax credit for businesses with research and development expenses in excess of \$5 million per year. With the new tax credit for Major R&D expenses, the Virginia Department of Taxation may grant up to \$20 million in tax credits each fiscal year.³⁸

³² “Florida R&D Credit – New law changes available amount, limits credit to qualified industries and changes distribution of credits.” *Tax Insights brief from PWC*. June 29, 2015. <https://www.pwc.com/us/en/state-local-tax/newsletters/salt-insights/assets/pwc-florida-research-development-credit-new-law-changes.pdf>

³³ “Governor Branstad signs bill expanding state biodiesel incentives.” Iowa Biodiesel Board website. May 24, 2016. http://www.iowabiodiesel.org/index.cfm/24359/39213/governor_branstad_signs_bill_expanding_state_biodiesel_incentives

³⁴ “Governor Baker Signs Economic Development Legislation: \$1 billion initiative will advance community development, workforce training, and innovation.” Press release. August 10, 2016. <http://www.mass.gov/governor/press-office/press-releases/fy2017/governor-baker-signs-economic-development-legislation.html>

³⁵ “Wexford tech complex draws 2 tenants, \$20 million in state incentives.” *Providence Journal*. December 12, 2016. <http://wexfordscitech.com/wexford-tech-complex-draws-2-tenants-20-million-in-state-incentives/>

³⁶ “I-195 Commission approves incentives for life sciences, innovation project.” *Providence Business News*. December 12, 2016. <http://www.pbn.com/I-195-Commission-approves-incentives-for-life-sciences-innovation-project,119136>

³⁷ “Providence, R.I., Is Building on a Highway’s Footprint.” *The New York Times*. August 18, 2015. https://www.nytimes.com/2015/08/19/realestate/commercial/a-highway-is-moved-and-development-follows-in-providence.html?_r=0

³⁸ “Virginia Bolsters Research and Development Tax Credit.” Tax Matters by Aronson website. March 14, 2016. <http://blogs.aronsonllc.com/tax/virginia-bolsters-research-and-development-tax-credit/>

Facilities and **INFRASTRUCTURE**

An investment in the physical structure needs of both basic and applied research at universities and life sciences-related institutes is an essential step in the invention and innovation process. Because the industrial applications of the industry have dramatically changed in the past ten years, state-of-the art research demands modern research facilities.

State governments, academic research centers and private developers are very aware of this competitive advantage and have increasingly integrated the physical facilities into the long-term vision and strategy for economic development by setting aside physical assets to leverage public-private partnerships in early stage commercialization efforts..

ALABAMA

Alabama is providing a \$20 million state grant to help build a Center for Precision Medicine on the campus of the HudsonAlpha Institute for Biotechnology in Huntsville. The new building will house research laboratories and life sciences companies.³⁹

CONNECTICUT

In 2015, the CURE Innovation Commons opened in a renovated laboratory building in Groton that was donated by Pfizer. The 22,000-square-foot biotech incubation facility, which features laboratories, office suites, conference rooms, event space and office hours with mentor and industry experts, was renovated with a \$4.2 million grant from the Department of Economic and Community Development.⁴⁰

ILLINOIS

In March 2017, North Chicago's Rosalind Franklin University of Medicine and Science announced plans to build a new innovation and research park that will provide labs and incubator space for faculty and commercial biotechnology startups, as well as national and international life science firms.⁴¹

NEW JERSEY

Located in the heart of New Jersey's research corridor between Rutgers and Princeton universities, the Commercialization Center for Innovative Technologies (CCIT) incubator offers numerous wet labs and access to a wide array of resource and networking opportunities essential to the startup community. The incubator's leasable space includes offices, as well as both small and large labs. The 46,000-square-foot CCIT also offers discounted first-year rent for university spinouts. Additionally, CCIT provides tenant companies with educational programs and a wealth of supporting resources, including helping to identify funding sources and providing access to small business development resources and administrative support. Companies at the incubator collaborate with Rutgers, Princeton, Stevens Institute of Technology, and New Jersey Institute of Technology, as well as with cancer research/treatment facilities Sloan Kettering in New York and MD Anderson Cancer Center in Texas.⁴²

³⁹ "New HudsonAlpha biotech center focuses on 'precision medicine.'" *Huntsville Times*. December 14, 2016.

⁴⁰ <http://cureconnect.org/cure-innovation-commons/>

⁴¹ "Rosalind Franklin University announces construction of new Innovation and Research Park." Press release. March 9, 2017. <https://www.rosalindfranklin.edu/research/innovation-and-research-park/updates/>

⁴² <http://www.ccitnet.com/>

NORTH CAROLINA

In 2016, the North Carolina Biotechnology Center created a Landing Pad program to help bioscience companies establish a presence in the state. The North Carolina Biotechnology Center Landing Pad offers short-term flexible lease office space in Research Triangle Park as well as easy access to NC's life science community facilitated by NCBiotech staff. Tenants have immediate access to a full-service conference center, accounting and information services, university and investor connectivity, and a personal liaison to support a soft landing in North Carolina.⁴³

PENNSYLVANIA

In October 2016, the University of Pennsylvania opened a \$26 million business incubator and laboratory for technology and life science startups. The Pennovation Center is a 58,000 square foot building in West Philadelphia. The Pennovation Center includes a full service technology incubator, basic wet and dry laboratories, private offices, inventor garages and coworking space.⁴⁴

PUERTO RICO

The Comprehensive Cancer Center of Puerto Rico was inaugurated in 2016, with an investment of over \$100 million.⁴⁵ This research/treatment complex complements the new 154,000 square foot Translational Molecular Complex built at a cost of about \$90 million and the Puerto Rican Consortium for Clinical Investigation (PROCI) to discover, study, develop, register and commercialize new molecule entities.

TEXAS

The Austin Community College Bioscience Incubator (ABI) opened in January 2017 with support from the Texas Emerging Technology Fund. The ABI provides wet laboratory and Current Good Manufacturing Processes (CGMP) space, as well as business incubation support for small biotechnology companies needing to conduct product development for commercialization.⁴⁶

“The high-tech sector is in high growth in Texas, and our health care sector and innovation in life sciences are growing very rapidly. These are areas that, because they are sectors of the American economy that are growing so rapidly, will continue to spur our economy.”

*Governor Greg Abbot
Texas, March 6, 2017*

⁴³ <http://www.nobiotech.org/landingpad>

⁴⁴ <https://www.pennovation.upenn.edu/>

⁴⁵ <http://caribbeanbusiness.com/puerto-rico-unveils-200m-center-to-treat-research-cancer/>

⁴⁶ <http://sites.austincc.edu/incubator/>



GLOSSARY

of Economic Development Tax Support Terms for the Biosciences Sector

Angel Investor: An investor who provides financial backing for small startups or entrepreneurs. Angel investors typically invest their own funds, as opposed to venture capitalists who manage pooled money in a professionally managed fund. The capital provided by an angel investor can be a one-time injection of seed money or ongoing support.

Bioscience Research: The basic, applied, or translational research that leads to the development of therapeutics, diagnostics, or devices to improve human health or agriculture.

Business Incubation: A business support process that accelerates the successful development of start-up and fledgling companies by providing entrepreneurs with an array of targeted resources and services

Business Retention: The activity that an economic or workforce development agency undertakes in order to reduce the loss of private sector businesses.

Drug Development Costs: The total cost of developing a new drug, including studies conducted after regulatory approval. According to a 2012 analysis by the Tufts Center for the Study of Drug Development, the average cost is \$1.2 billion.

Economic Development: A process that influences the growth and restructuring of an economy to enhance the economic well-being of a community. Economic development encompasses job creation, increases in community wealth and the improvement of quality of life.

FDA Review: The regulatory process by which the U.S. Food and Drug Administration reviews a sponsor company's data from clinical studies to determine if the new product is safe and effective for its intended use.

Human Capital: A measure of the economic value of an employee's skill set, including education, experience, abilities, and productivity.

Incentives: Benefits or rewards offered to motivate action. Incentives are often as part of an economic development strategy, including tax abatements and credits, low interest loans, infrastructure improvements, job training and land grants.

Initial Public Offering (IPO): The first sale of stock by a company to the public.

Public-Private Partnership: A venture which is funded and operated through a partnership between a government entity and one or more private sector companies, usually to finance, build or manage a project for the public good.

Seed Capital: The funding required to get a new business started. The capital is almost always supplied by an entrepreneur and his/her family, friends and relatives, and it is used to help attract other investments.

Tax Credit: The amount of money that can be offset against a tax liability. Tax credits are often used as an incentive to attract new companies and retain existing companies in the state.

Tax Exemption: The amount of money that can be subtracted from the assessed market rate. Tax exemptions are often granted to individuals, institutions and types of property.

“Fostering research, innovation, and discovery is critical to Rhode Island’s future as a center of advanced industries. This facility, along with other recent projects, positions the University to attract businesses, entrepreneurs, and inventors to our state and grow our economy. I want to commend the University and its leadership for delivering yet another spectacular facility that will provide longstanding benefits to its students and Rhode Island as a whole. This is a proud day for our state.”

Governor Gina Raimondo
Rhode Island, September 6, 2016

“These are the jobs of the future. Biotechnology affects everything that we do, from agriculture to medicine.”

Governor Terry McAuliffe
Virginia, August 22, 2016

Tax Incentives: The use of various tax relief measures such as tax exemptions, tax credits or tax abatements to recruit and attract businesses to a community or help local businesses expand.

Technology Incubator: Often designed for public and private R&D facilities, high-tech companies and science-based companies, a technology incubator is an entity that helps companies by providing necessary resources and support including infrastructure, technology development, research assistance, and assistance in securing funding.

Technology Transfer: The process of transferring scientific findings from one organization to another for the purpose of furthering development and commercialization.

Venture Capital: Money provided by investors to startup firms and small businesses that have long-term growth potential. Venture capital is an important source of equity for start-up companies.

Workforce Development: An economic development approach focused on enhancing the training, skills and performance of the employees.



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