

# TEconomy 2018

## Evidence and Opportunity: Impact of Life Sciences in North Carolina



### **North Carolina Biotechnology Center**

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[ncbiotech.org](http://ncbiotech.org)

# TEconomy NC Life Science Report 2018

- Evaluation/Comparison of North Carolina's Life Science Industry (BLS data)
- Economic Impact of North Carolina's Life Science Industry (NCBiotech data)
- Role/Impact of the North Carolina Biotechnology Center
- North Carolina's Biomanufacturing Sector
- Evidence and Opportunity

## *Innovating Tomorrow's Economic Landscape*

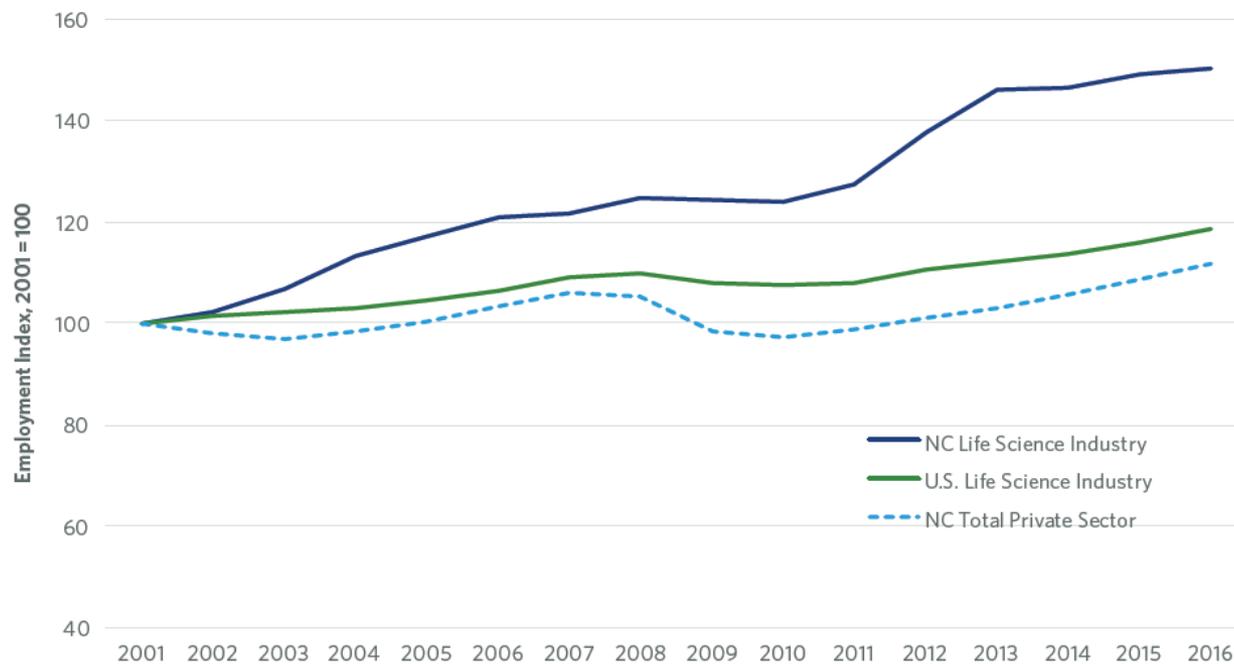
TEconomy Partners is a global leader in research, analysis and strategy for innovation-driven economic development. Today we're helping nations, states, regions, universities, institutions and industries blueprint their future and translate knowledge into prosperity.

# Evaluation/Comparison of North Carolina's Life Science Industry



# Growth of NC Life Science Industry

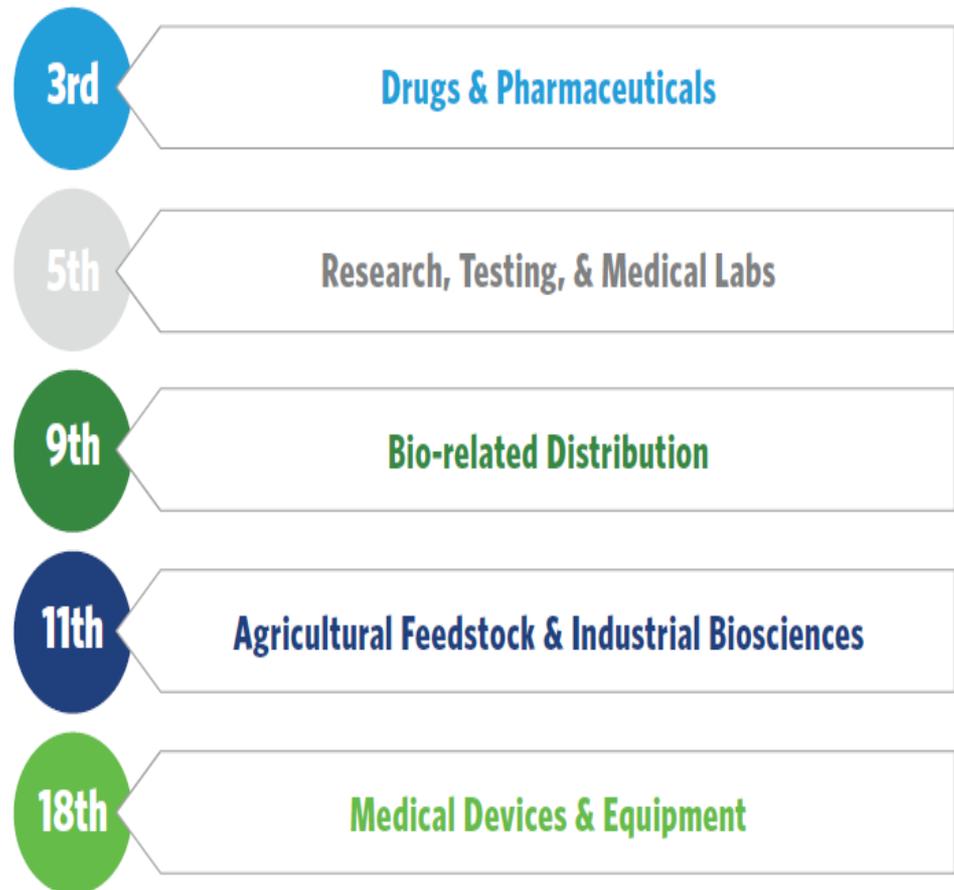
**Figure ES-1: Life Science Industry Employment Trends, North Carolina and the United States, 2001-2016**



Source: TEconomy Partners' analysis of U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW) data; enhanced file from IMPLAN.

# Classifying & Measuring

- **Agricultural Feedstock & Industrial Biosciences**
- **Bioscience-Related Distribution**
- **Drugs & Pharmaceuticals**
- **Medical Devices & Equipment**
- **Research, Testing & Medical Labs**



# Life Sciences in North Carolina vs US

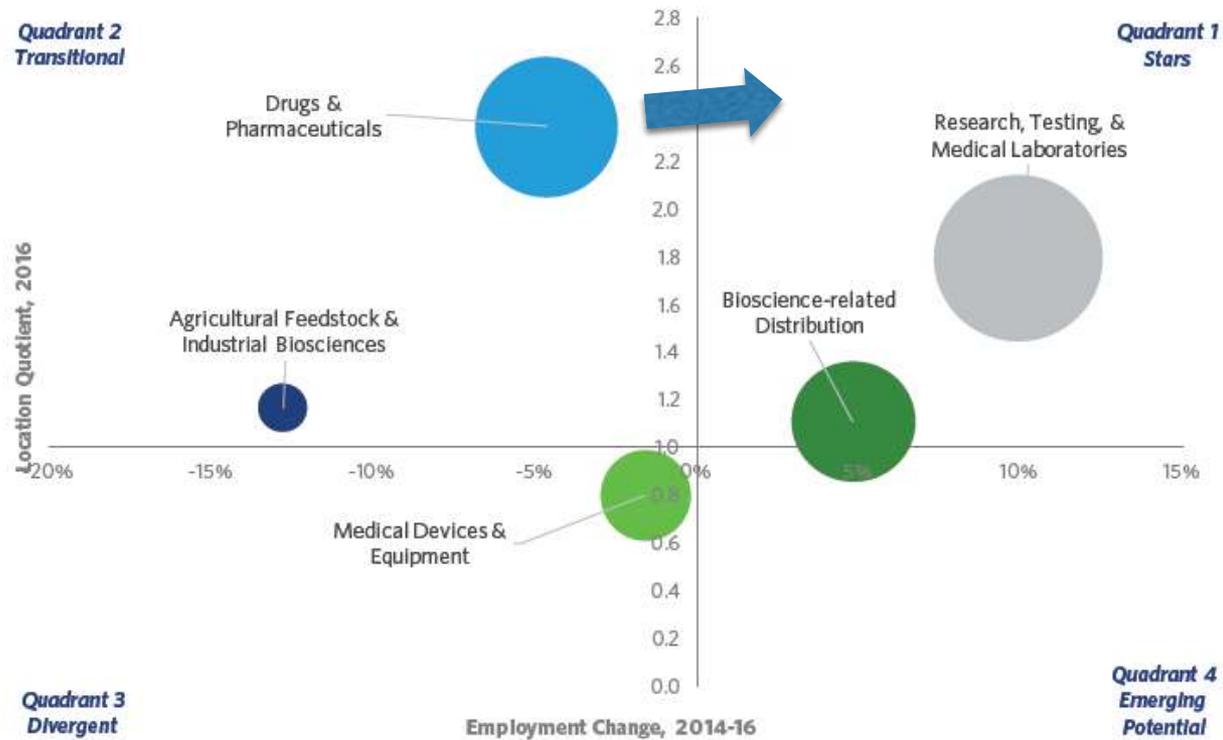
**Table 1: Summary Employment Metrics, North Carolina and the United States, 2016**

Life Sciences & Major Subsectors	NC Establishments		NC Employment		U.S. Employment	NC Location Quotient, 2016
	Count, 2016	Change, 2014-16	Count, 2016	Change, 2014-16	Change, 2014-16	
<b>Total Life Sciences</b>	<b>3,843</b>	<b>16.4%</b>	<b>75,582</b>	<b>2.5%</b>	<b>4.4%</b>	<b>1.47</b>
Agricultural Feedstock & Industrial Biosciences	45	-10.0%	2,331	-12.8%	-1.2%	1.16
Bioscience-related Distribution	1,615	12.5%	15,287	4.9%	3.7%	1.10
Drugs & Pharmaceuticals	125	5.9%	20,656	-4.6%	2.0%	2.34
Medical Devices & Equipment	196	0.5%	8,411	-1.6%	2.9%	0.79
Research, Testing, & Medical Laboratories	1,862	23.9%	28,896	9.9%	8.2%	1.79

Source: TEconomy Partners' analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced file from IMPLAN.

# North Life Science Industry

Figure 4: North Carolina Life Science Industry: Employment Size, Concentration, and Change, 2014-2016



Source: TEconomy Partners' analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced file from IMPLAN.

# US Life Science Clusters

**Table 3: Summary of Life Science Industry Employment Metrics, North Carolina and Comparison States, 2016**

State	Establishments, 2016	Employment, 2016	Employment Change, 2014-2016	Location Quotient, 2016
California	9,924	267,844	7.0%	1.31
Massachusetts	2,567	93,912	8.9%	2.13
New Jersey	2,897	93,824	2.6%	1.94
Texas	5,578	89,746	8.6%	0.63
Florida	6,198	87,061	4.3%	0.83
Illinois	3,778	85,210	3.8%	1.16
Pennsylvania	2,517	81,035	6.1%	1.11
New York	3,514	78,872	1.4%	0.71
<b>North Carolina</b>	<b>3,843</b>	<b>75,582</b>	<b>2.5%</b>	<b>1.47</b>
Indiana	1,730	58,018	-0.1%	1.55

Source: TEconomy Partners' analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced file from IMPLAN.

# Life Science Wages

**Table 2: Average Annual Wages in the Life Science Industry and Major Subsectors, North Carolina and the United States, 2016**

Life Science Industry and Subsectors	North Carolina	U.S.
Agricultural Feedstock & Industrial Biosciences	\$101,868	\$80,961
Drugs & Pharmaceuticals	\$98,800	\$113,815
Research, Testing & Medical Laboratories	\$93,432	\$106,942
<b>Total Life Sciences</b>	<b>\$91,307</b>	<b>\$98,961</b>
Bioscience-Related Distribution	\$91,048	\$93,677
Medical Devices & Equipment	\$63,153	\$84,746
<b>Total Private Sector</b>	<b>\$47,248</b>	<b>\$53,354</b>

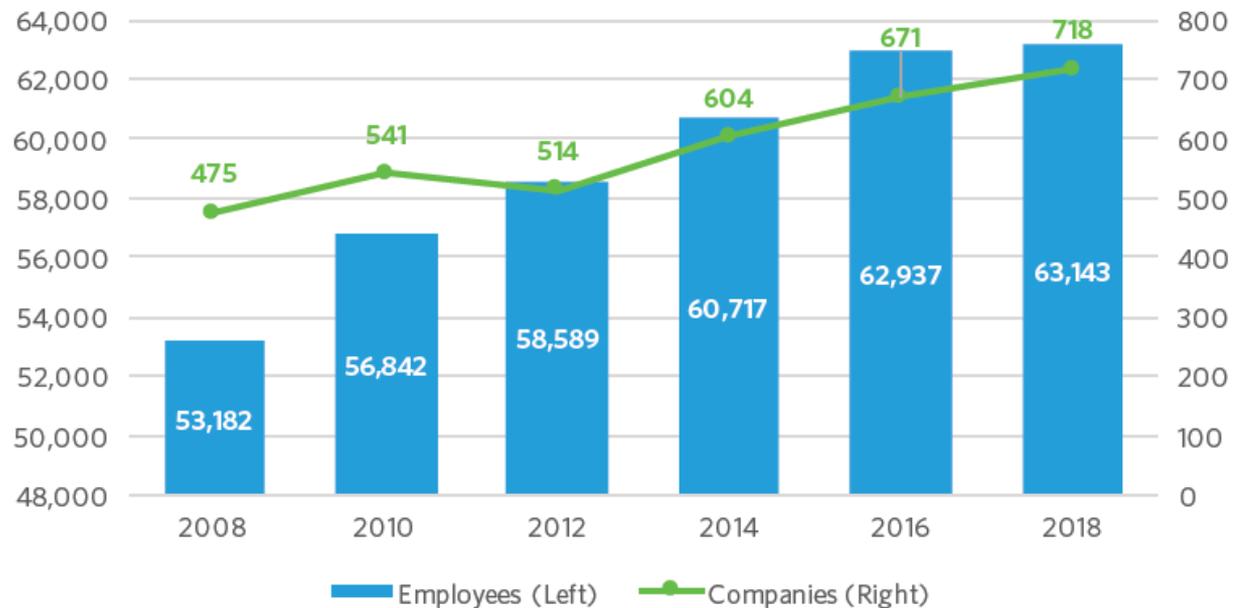
Source: TEconomy Partners' analysis of U.S. Bureau of Labor Statistics, QCEW data; enhanced file from IMPLAN.

# Economic Impact of North Carolina's Life Science Industry



# North Carolina Life Science Industry (NCBiotech)

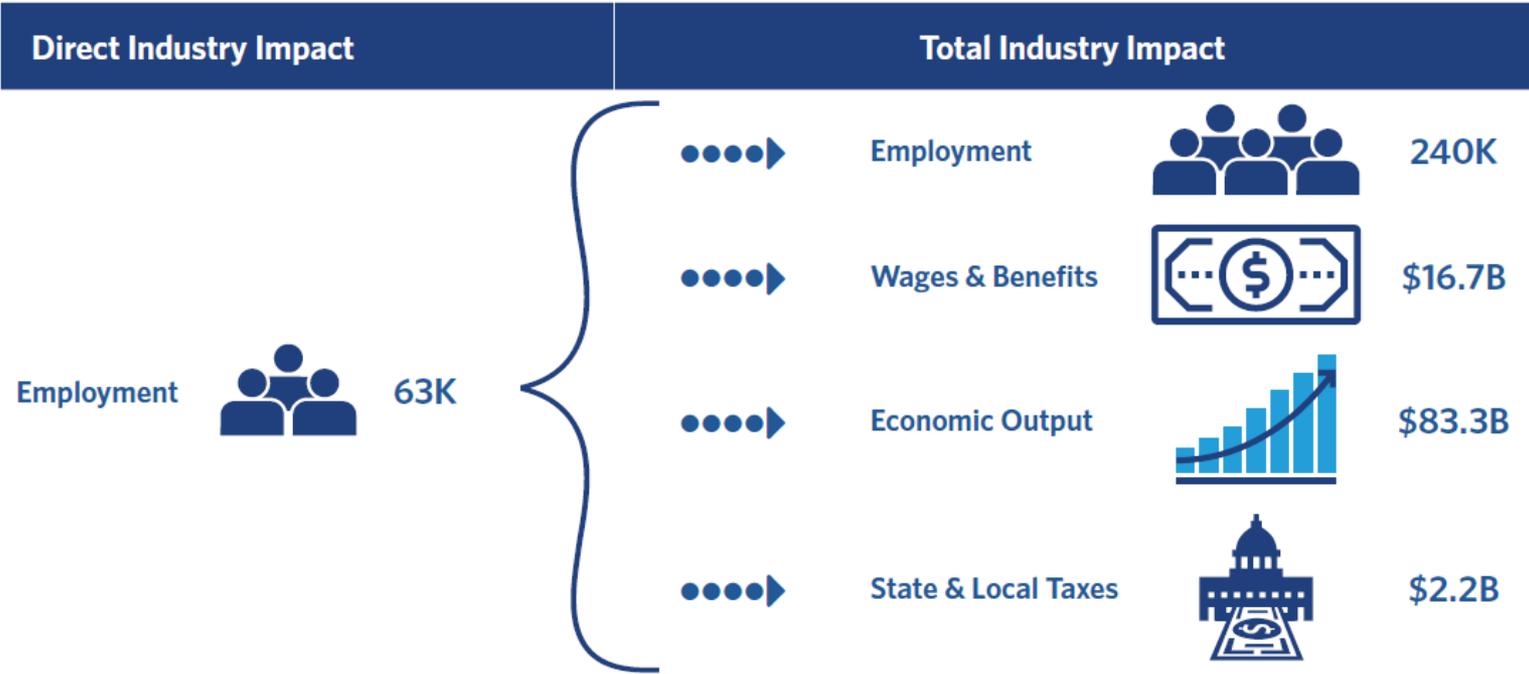
**Figure 9: North Carolina Life Science Companies and Employment Based on the NCBiotech Company Database**



Source: TEconomy Partners' analysis of NCBiotech data.

# Economic Contribution of NC's Life Science Industry

Figure ES-4: The Economic Contribution of the Life Science Industry to the North Carolina Economy, 2018



Source: TEconomy Partners analysis of NCBiotech data using IMPLAN.

# A Decade of Growth

**Table 5: A Decade of Growth—The Economic Contribution of the Life Science Industry to the North Carolina Economy, 2008 and 2018**

Economic Impact	2008	2018	Change 2008-2018	% Change 2008-2018
Direct Impact (Output \$ Millions)	\$28,691	\$55,340	\$26,649	93%
Total Impact (Output \$ Millions)	\$45,806	\$83,311	\$37,505	82%
<b>State Impact Multiplier</b>	<b>1.60</b>	<b>1.51</b>		
Direct Impact (Employment)	53,182	63,143	9,961	19%
Indirect Impact (Employment)	64,913	91,447	26,534	41%
Induced Impact (Employment)	61,913	85,691	23,778	38%
Total Impact (Employment)	180,007	240,281	60,274	33%
<b>State Impact Multiplier</b>	<b>3.38</b>	<b>3.81</b>		
State and Local Tax Revenues (\$ Millions)	\$1,436	\$2,181	\$745	52%

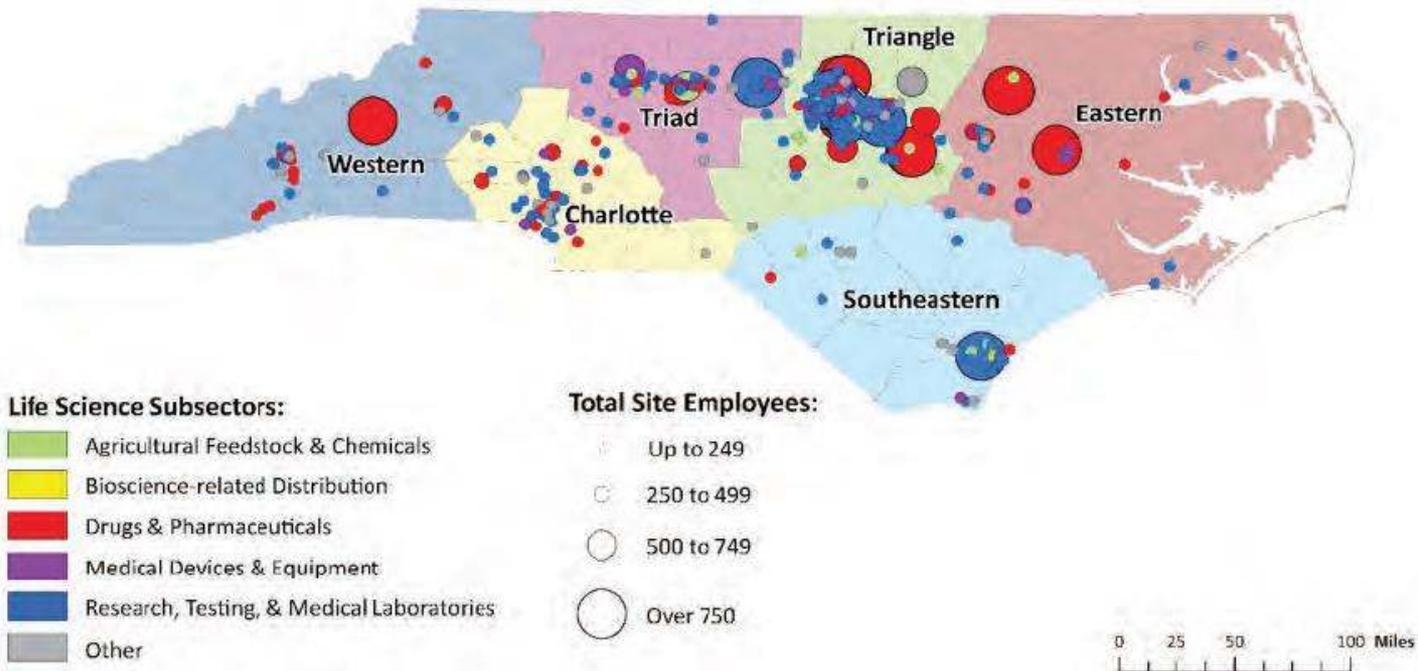
Source: TEconomy Partners' analysis of NCBiotech data using IMPLAN.

# Economic Contribution by Segment

	Output (\$M)	Labor (\$M)	Employment	Taxes (\$M)
<b><u>Total Life Science</u></b>	<b><u>83,311</u></b>	<b><u>16,680</u></b>	<b><u>240,281</u></b>	<b><u>2,181</u></b>
Ag Feedstock	9%	6%	6%	7%
Drugs & Pharma	68%	58%	55%	65%
Med Device	4%	5%	5%	4%
Res, Testing, Lab	16%	29%	31%	20%
Distribution, other	3%	2%	3%	4%

# Life Science is Statewide in North Carolina

**Figure ES-2: North Carolina Life Science Industry Companies, Statewide and by Region, Industry Subsector, and Employment Level, 2018**



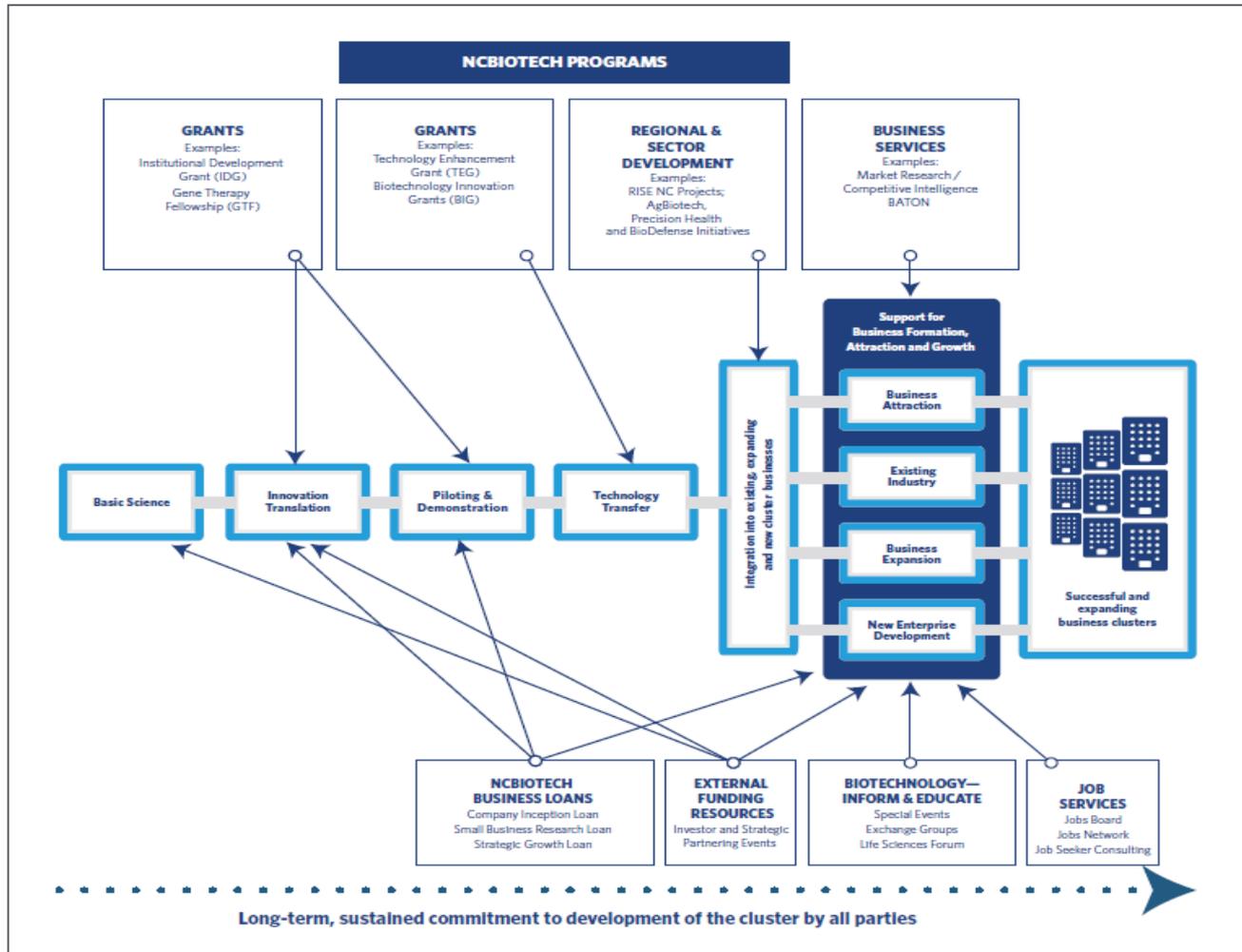
Source: NCBiotech Company Database.



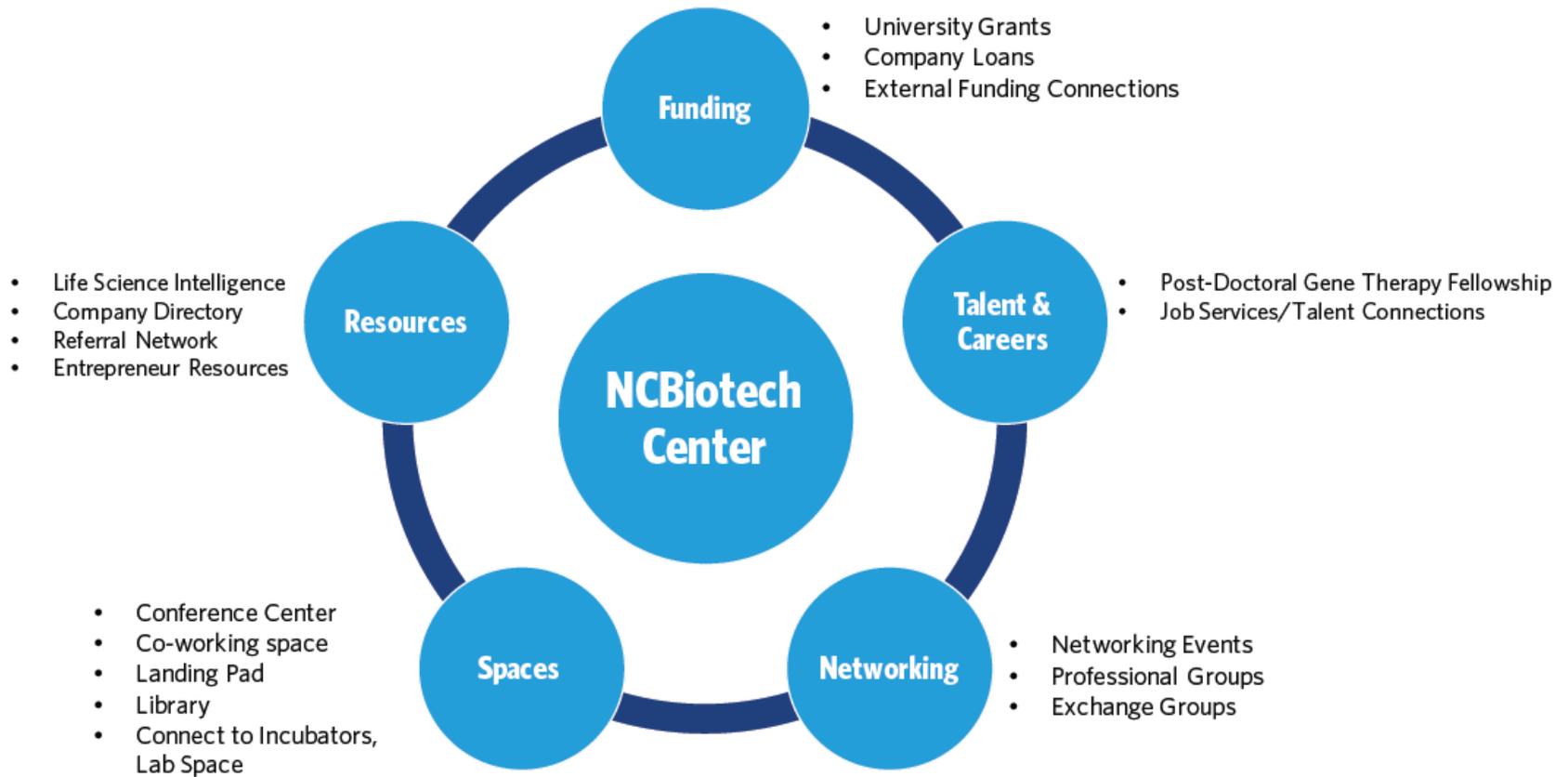
# Role/Impact of the North Carolina Biotechnology Center



# North Carolina Biotechnology Center



# North Carolina Biotechnology Center



# Economic Contribution of the North Carolina Biotechnology Center

- Active loan portfolio (107 companies):
  - ✓ **\$3.8B** annual economic output
  - ✓ **\$732M** annual labor income
  - ✓ **10,390** employment (2,544 direct)
  - ✓ **\$98M** annual state/local taxes
- Life science recruitment/expansion (25 companies FY 2017-18):
  - ✓ **\$2.1B** annual economic output
  - ✓ **\$580M** annual labor income
  - ✓ **8,732** employment (3,080 anticipated direct)
  - ✓ **\$59M** annual state/local taxes

# New Programs

## The Evolving Role and Focus of NCBiotech's Industry and Ecosystem Support: Recent Accomplishments and New Developments

With nearly 35 years of history, NCBiotech has learned that, for the industry to thrive throughout the state, its role must continually be evaluated and evolve, where appropriate, to emphasize new and emerging opportunities. Recent Center activities and new developments highlighted in the report include:

- **Establishment of the Pfizer-NCBiotech Distinguished Postdoctoral Fellowship in Gene Therapy:** supporting 18 postdoctoral fellows with research and professional development over 3 years.
- **Crop Improvement Projects Led by the NCBiotech Crop Commercialization Program (CCP):** working collaboratively to establish an industry base and opportunities for growing dedicated cellulosic crops for conversion to fuels and other high-value chemicals.
- **Establishment of the North Carolina Precision Health Collaborative (NCPHC):** convening partners to realize the state's potential in advancing precision health/precision medicine.
- **Establishment of the NCBiotech Clinical Research Consortium:** enhancing and advancing the state's existing strength with respect to Clinical Research Organizations (CROs) via a broad Consortium.

# North Carolina's Biomanufacturing Industry



# What is Biomanufacturing?

## What is Biomanufacturing?

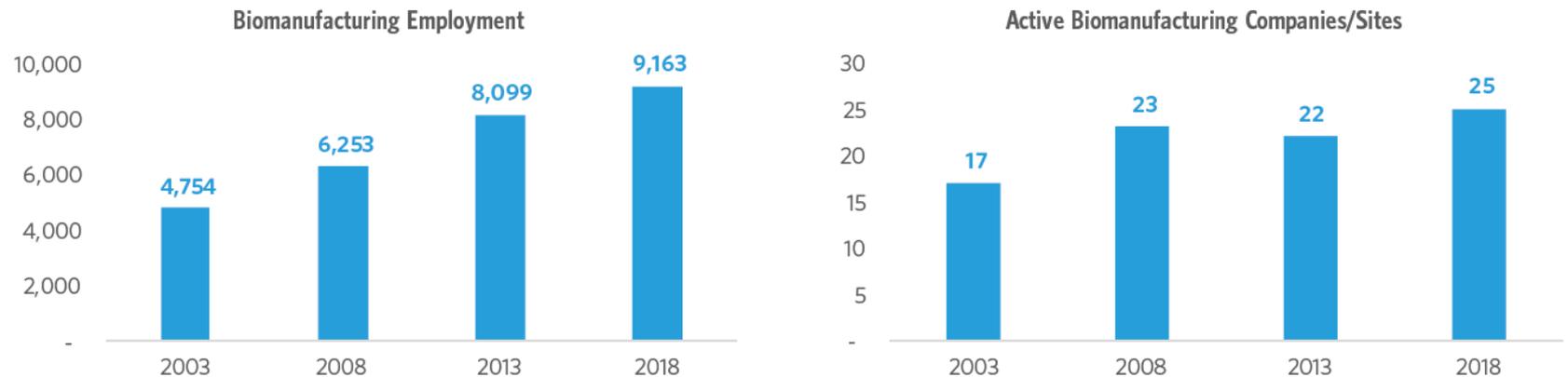
Biomanufacturing uses living cells and biological systems to make commercial products, or to extract and utilize a particular molecule via the bioprocessing of tissues or cells. These products or biological molecules are used across a varied set of applications and markets for medicines and vaccines; food and beverage ingredients and processing; and other industrial applications. Biomanufactured products can be harvested from animal or plant cells, from blood, or from microbes.

Biomanufacturing has come to play a critical role in the pharmaceutical and biological products manufacturing industry and represents an ongoing paradigm shift from traditional small-molecule therapeutic product manufacturing to products based on biomaterials and biomolecules. The role of this key segment of the biotech manufacturing industry is expected to continue growing to meet the needs of new generations of biobased products, ranging from medical products like immunotherapeutics to food and beverage applications in enzymes to industrial uses in plastics and other commercial products.

North Carolina represents a major hub of biomanufacturing activity and expertise. More than two dozen companies are part of this multidimensional sector of the life sciences (see details on the North Carolina context that follows).

# Biomanufacturing Growth in North Carolina

**Figure 16: North Carolina Active Biomanufacturing Companies and Biomanufacturing Employment, 2003-2018**



Source: NCBiotech Company Database.

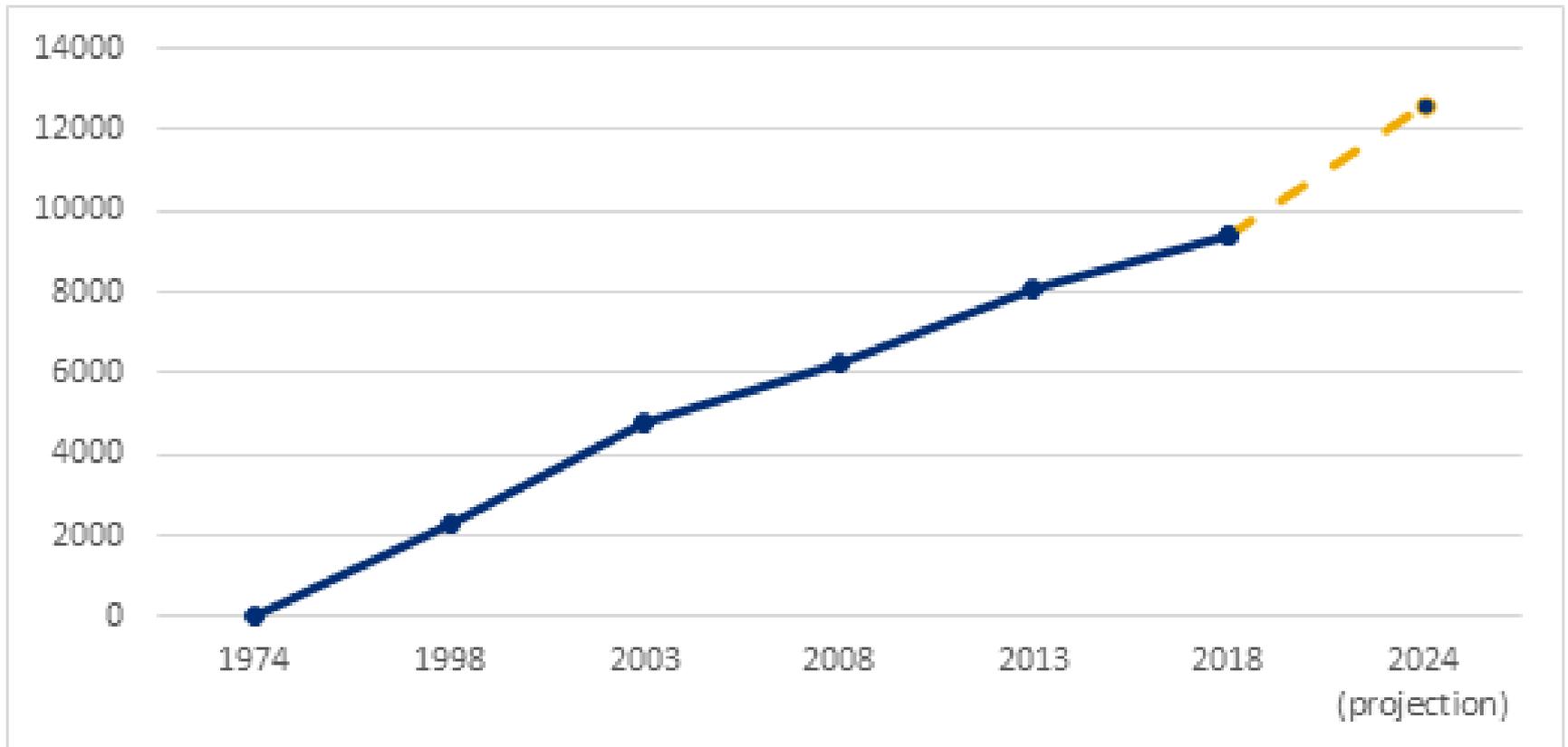
# Economic Contribution of Biomanufacturing in NC

**Table 10: Economic Contribution of the 25 Currently Active Biomanufacturing Companies on the North Carolina Economy, 2018**

Economic Impact	Output (\$ Millions)	Labor Income (\$ Millions)	Employment	State/Local Tax Revenue (\$ Millions)
<b>Total Life Science Industry</b>				
Direct Effect	\$55,340	\$6,849.3	63,143	\$793.4
Indirect Impacts	\$16,464	\$6,230.8	91,447	\$796.3
Induced Impacts	\$11,507	\$3,600.4	85,691	\$590.9
<b>Total Impact</b>	<b>\$83,311</b>	<b>\$16,680.4</b>	<b>240,281</b>	<b>\$2,180.6</b>
<b>Impact of the 25 Biomanufacturing Companies Assisted by NCBioImpact</b>				
Direct Effect	\$9,850	\$1,187.6	9,163	\$136.9
Indirect Impacts	\$2,485	\$904.4	13,251	\$136.2
Induced Impacts	\$1,850	\$578.7	13,773	\$95.2
<b>Total Impact</b>	<b>\$14,185</b>	<b>\$2,670.7</b>	<b>36,187</b>	<b>\$368.3</b>
<b>Share of Total Industry Impact</b>				
Direct Effect	17.8%	17.3%	14.5%	17.3%
Indirect Impacts	15.1%	14.5%	14.5%	17.1%
Induced Impacts	16.1%	16.1%	16.1%	16.1%
<b>Total Impact</b>	<b>17.0%</b>	<b>16.0%</b>	<b>15.1%</b>	<b>16.9%</b>

Source: TEconomy Partners' analysis of NCBioTech data using IMPLAN.

# Biomanufacturing Employment Growth in NC



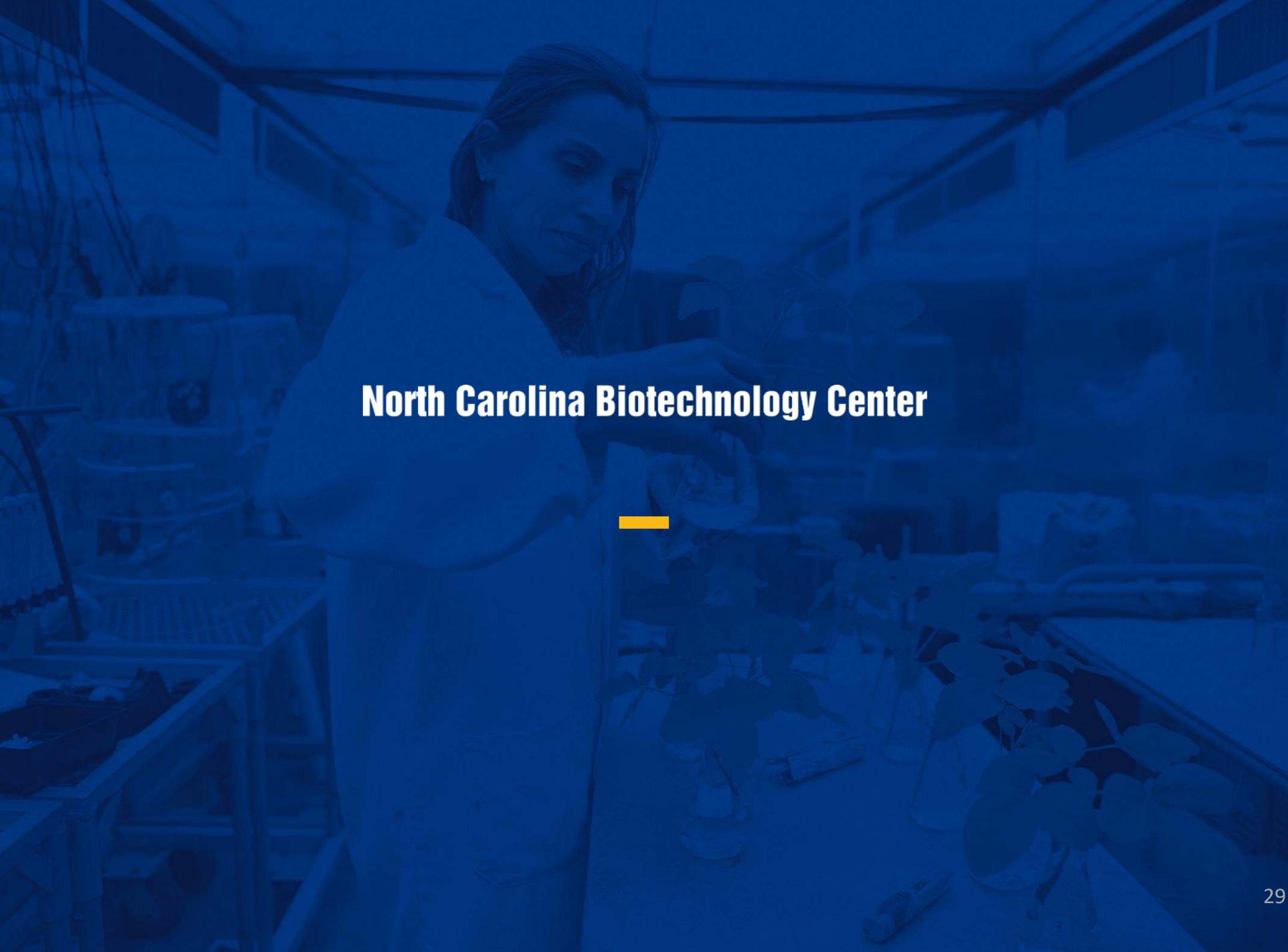
# 2018 Evidence and Opportunity

## **Evidence**

*“North Carolina has established one of the nation’s leading life science clusters, characterized by steady, long-term growth and establishment of a diverse blend of industry, technology and market strengths and niches... The industry’s standing and top-tier position today has been hard-earned, however, in large part due to the early and consistent dedication of the North Carolina Biotechnology Center, with funding from the State of North Carolina, through an emphasis on industry and ecosystem development programs and initiatives.”*

## **Opportunity**

*Talent, Infrastructure, Investment*



# North Carolina Biotechnology Center

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