## SOUTH DAKOTA'S 6,061 BIOTECHNOLOGY WORKERS ARE HEALING, FUELING & FEEDING THE WORLD

South Dakota's bioscience industry is helping diversify and grow the U.S. economy. American bioscience innovation in health, energy and agriculture is creating high-skill, high-wage jobs, driving economic growth and helping to improve the quality of life for Americans from coast to coast.

### HEALING

Since 1982, biotechnology drugs and vaccines have helped improve the quality of life for more than 250 million patients living with debilitating diseases such as cancer, diabetes and HIV/AIDS. Currently there are more than 900 biotechnology drugs in clinical development targeting cancer, cardiovascular disease, HIV/AIDS and thousands of rare or "orphan" diseases.

### FUELING

Industrial and environmental biotechnology companies are developing technologies to reduce waste, improve industrial processes and reduce our reliance on foreign sources of energy. Successful commercialization of cellulosic biofuels and renewable chemicals has created 8,000 new jobs in the past five years.

### FEEDING

Agricultural biotechnology benefits farmers, consumers and the environment by increasing crop yields and farm income, decreasing pesticide applications, increasing environmental sustainability and enhancing the nutritional profile of many foods – while also spurring America's economy.


**Source:** TEConomy Partners analysis of Bureau of Labor Statistics, QCEW data; enhanced file from IMPLAN.
**Note:** U.S. totals include Puerto Rico.

# SOUTH DAKOTA

TEConomy/BIO

Investment, Innovation and Job Creation in a Growing U.S. Bioscience Industry 2018

South Dakota's bioscience industry is growing and has a specialized concentration of employment relative to the national average. In 2016, the state's bioscience industry employed 6,061 in 504 business establishments. South Dakota bioscience firms have increased their employment base by 2.4 percent since 2014 with three of the five major industry subsectors gaining jobs during this period. The state has industrial strengths in several subsectors, with specialized employment concentrations in agricultural feedstock and industrial biosciences; bioscience-related distribution; and in medical device and equipment manufacturing. South Dakota has seen recent increases in NIH funding awards—in FY 2017, state institutions were awarded $23.5 million, up from $20.6 million in FY 2015.

## Bioscience Performance Metrics

**Summary of State Performance in Selected Bioscience-related Metrics**

| Metric | South Dakota | United States | Quintile |
|---|---|---|---|
| **Bioscience Industry, 2016** | | | |
| Bioscience Industry Employment | 6,061 | 1,743,639 | IV |
| Bioscience Industry Location Quotient | 1.21 | n/a | II |
| Bioscience Industry Establishments | 504 | 85,702 | IV |
| **Academic Bioscience R&D Expenditures, FY 2016** | | | |
| Bioscience R&D ($ thousands) | $60,759 | $41,972,205 | V |
| Bioscience Share of Total R&D | 59% | 62% | III |
| Bioscience R&D Per Capita | $71 | $130 | IV |
| **NIH Funding, FY 2017** | | | |
| Funding ($ thousands) | $23,547 | $26,150,485 | V |
| Funding Per Capita | $27 | $80 | IV |
| **Bioscience Venture Capital Investments, 2014-17 ($ millions)** | $22.30 | $66,168.62 | IV |
| **Bioscience and Related Patents, 2014-17** | 303 | 102,862 | IV |

*State ranking figures for bioscience performance metrics are calculated as quintiles, where I = top quintile, III = middle quintile, and V = bottom quintile.*
*For source notes, see end of State Profile.*

# SOUTH DAKOTA // INVESTMENT, INNOVATION AND JOB CREATION IN A GROWING U.S. BIOSCIENCE INDUSTRY 2018

| Industry Subsector | South Dakota | | United States | |
|---|---|---|---|---|
| | 2016 | 2014–2016 Change | 2016 | 2014–2016 Change |
| **Agricultural Feedstock and Industrial Biosciences** | | | | |
| Establishments | 26 | 4.0% | 1,709 | -3.2% |
| Employment | 815 | 0.7% | 68,027 | -1.2% |
| Location Quotient | 4.17 | | n/a | |
| Direct-Effect Employment Multiplier | 6.93 | | | |
| Total Employment Impact | 5,652 | | | |
| Average Annual Wage | $60,426 | -1.2% | $80,961 | 2.7% |
| **Bioscience-Related Distribution** | | | | |
| Establishments | 353 | 10.8% | 39,149 | 3.8% |
| Employment | 2,673 | 4.2% | 469,640 | 3.7% |
| Location Quotient | 1.98 | | n/a | |
| Direct-Effect Employment Multiplier | 2.01 | | | |
| Total Employment Impact | 5,375 | | | |
| Average Annual Wage | $62,825 | 3.6% | $93,677 | 2.7% |
| **Drugs and Pharmaceuticals** | | | | |
| Establishments | 3 | 50.0% | 3,754 | 13.7% |
| Employment | 9 | -65.5% | 299,113 | 2.0% |
| Location Quotient | 0.01 | | n/a | |
| Direct-Effect Employment Multiplier | 12.72 | | | |
| Total Employment Impact | 113 | | | |
| Average Annual Wage | $67,486 | 167.8% | $113,815 | -3.2% |
| **Medical Devices and Equipment** | | | | |
| Establishments | 15 | 7.1% | 8,083 | 5.9% |
| Employment | 1,704 | -3.9% | 359,293 | 2.9% |
| Location Quotient | 1.65 | | n/a | |
| Direct-Effect Employment Multiplier | 2.44 | | | |
| Total Employment Impact | 4,165 | | | |
| Average Annual Wage | $62,840 | 4.3% | $84,746 | 6.5% |
| **Research, Testing and Medical Laboratories** | | | | |
| Establishments | 108 | 9.5% | 33,007 | 13.1% |
| Employment | 860 | 15.4% | 547,566 | 8.2% |
| Location Quotient | 0.55 | | n/a | |
| Direct-Effect Employment Multiplier | 2.01 | | | |
| Total Employment Impact | 1,729 | | | |
| Average Annual Wage | $55,950 | -2.6% | $106,942 | 5.5% |
| **Total Bioscience Industry** | | | | |
| Establishments | 504 | 10.2% | 85,702 | 7.7% |
| Employment | 6,061 | 2.4% | 1,743,639 | 4.4% |
| Location Quotient | 1.21 | | n/a | |
| Direct-Effect Employment Multiplier | 2.81 | | | |
| Total Employment Impact | 17,033 | | | |
| Average Annual Wage | $61,538 | 2.5% | $98,961 | 3.1% |
| **Total Private Sector** | | | | |
| Establishments | 30,615 | 3.3% | 9,243,034 | 3.4% |
| Employment | 347,533 | 2.5% | 120,884,570 | 4.2% |
| Average Annual Wage | $41,127 | 6.5% | $53,354 | 4.3% |

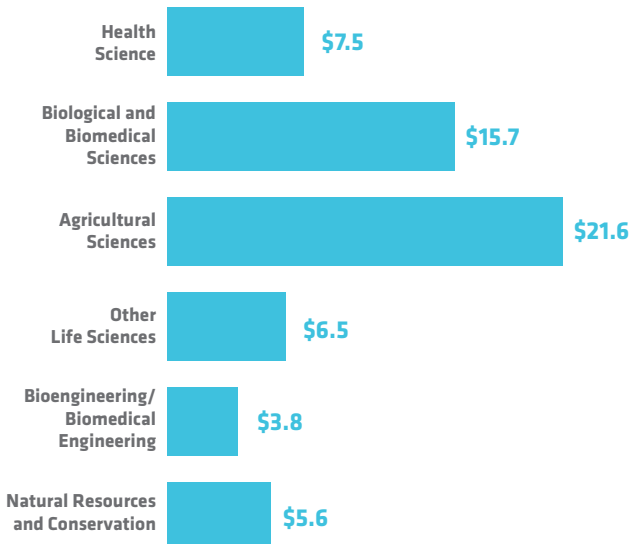
*Note: U.S. employment metrics include Puerto Rico.*

## Bioscience Research in South Dakota

Bioscience Academic R&D Expenditures

$ Millions

**FY 2016**




NIH Awards

$ Millions

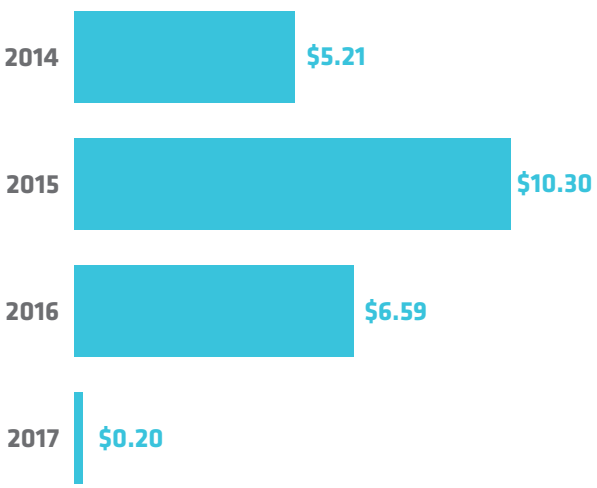
**FY 2014-2017**


## Bioscience Venture Capital in South Dakota

Bioscience-Related Venture Capital Investments

$ Millions

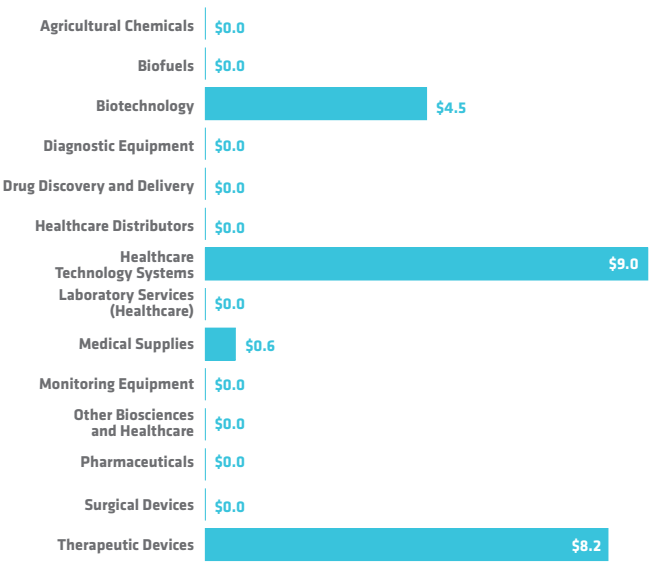
**2014-2017**




Bioscience-Related Venture Capital Investments by Segment

$ Millions

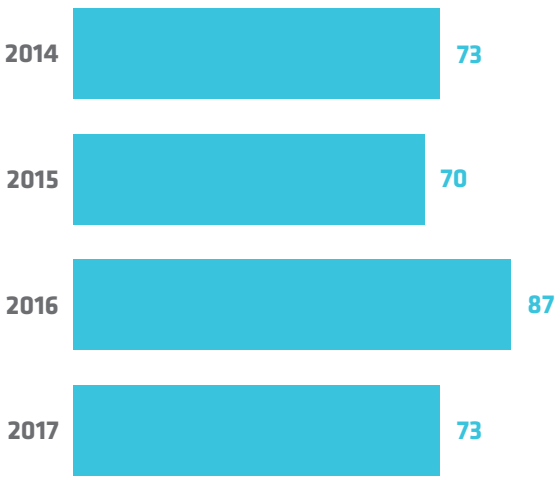
**2014-2017**



## Bioscience Patents in South Dakota

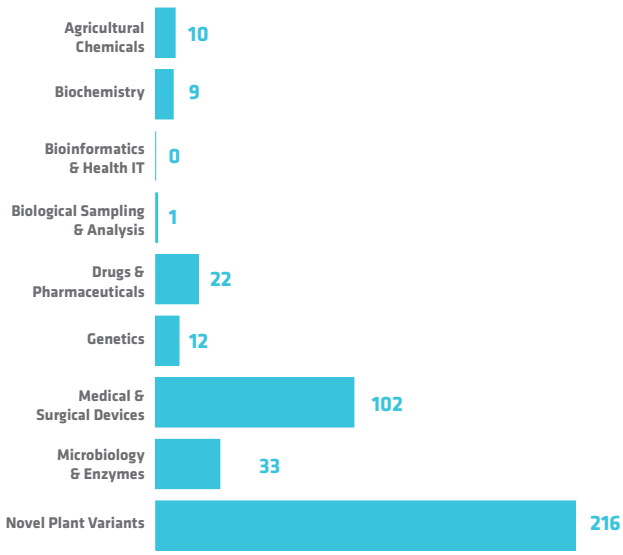
Bioscience-Related U.S. Patents

**2014-2017**




Bioscience-Related U.S. Patents by Segment

**2014-2017**




## Source Notes

**Employment, Establishments and Wages:** U.S. Bureau of Labor Statistics, Quarterly Census of Employment and Wages (QCEW), enhanced file from IMPLAN.

**Employment Multipliers:** IMPLAN state-level Input/Output models.

**Academic R&D Expenditures:** National Science Foundation (NSF) Higher Education Research and Development (HERD) Survey.

**NIH Funding:** National Institutes of Health, NIH Awards by Location & Organization (summary information within RePORT database).

**Venture Capital:** PitchBook Data, Inc.

**Patents:** U.S. Patent & Trademark Office data from Clarivate Analytics' Derwent Innovation patent analysis database.

For a more detailed discussion of the data and methodology used, please see the Appendix to the full national report.

TECONOMY PARTNERS LLC

Bio Biotechnology Innovation Organization

25 YEARS OF INNOVATION