Explore opportunities in

# Biotechnology Systems

## Agriculture, Food & Natural Resources Cluster

Career and Technical Education 2017

Do you enjoy...

- Designing & conducting experiments
- Helping meet societal needs
- Testing new biofuels
- Microbiology
- Observing physical properties
- Laboratory testing
- Bioethics
- Data analysis & research
- Physics & advanced math
- Independent work

Minnesota employers want you!

Learn just how far you can GROW in these high-demand careers.

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MINNESOTA STATE

RealTime Talent Using data to build the world's best workforce

Southern Minnesota CENTER OF AGRICULTURE

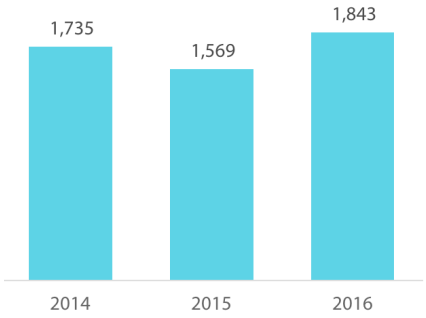
www.agcentric.org | www.cte.mnscu.edu | www.realtimetalent.org | www.centerofagriculture.org

# Biotechnology Systems
# Career Pathway



Biotechnology is the application of scientific and engineering principles to solve problems concerning living organisms. A large part of the work in this pathway has to do with the processing of materials by microorganisms. Genetics, biofuel development, physics, and life sciences are all important parts of this career pathway.

### Biotechnology System Jobs Posted Online in Minnesota



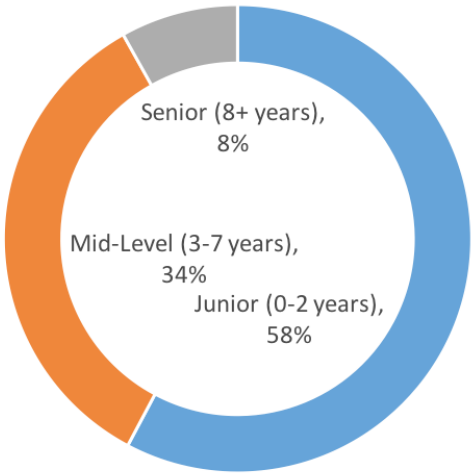

### Hiring Statistics in Minnesota (2016)

| | |
|---|---|
| Growth in jobs 2015-2016: | 17.5% (in flux) |
| Number of employers: | 243 employers |
| Overall outlook: | Bright |
| Median salary: | $45,000 / year |

### Top Occupations

- Biological Technicians (45%)
- Chemical Technicians (15%)
- Biological Science Teachers, Postsecondary (10%)
- Chemists (10%)
- Agricultural Inspectors (5%)

### Experience Level Sought



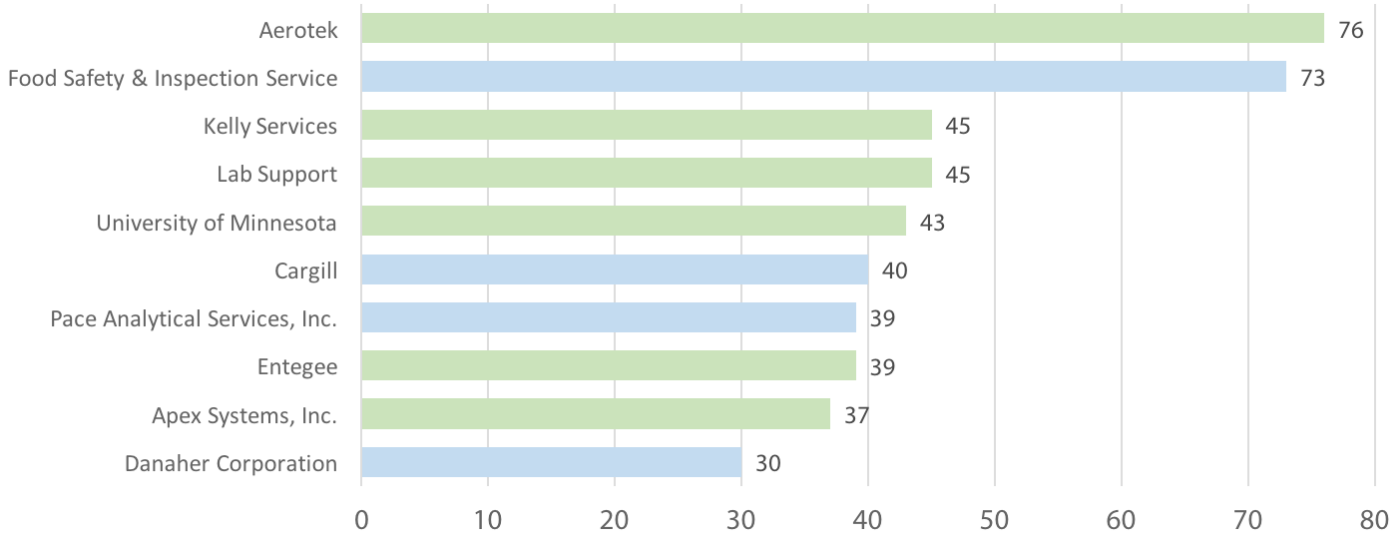

### Sample First-Year Job Titles in this Pathway

- Soybean Breeding Research Associate, Dupont
- Lab Technician, Dairy Farmers of America
- Chemist, Apex Systems Inc.

### Sample Senior Job Titles in this Pathway

- Chromatography Technician, General Mills
- Biochemistry Professor, Minnesota State
- Lead Microbiologist, 3M

### Top Employers who Recruited in 2016



## Top 5 Certifications

1. Good Laboratory Practices ↗
2. Secret Clearance ↗
3. HAZMAT ↗
4. Occupational Safety & Health Administration (OSHA) ↗
5. Ethics (NIH) ↗

## Top 10 Hard Skills

1. Molecular Biology ↗
2. Laboratory Experience ↗
3. Quality Control/Assurance ↗
4. Instrumentation ↗
5. Cell Biology ↗
6. Good Manufacturing Practice ↗
7. High Pressure Liquid Chromatography ↗
8. Immunology ↗
9. Technical Support ↗
10. Genotyping ↗

## Top 10 Soft Skills

1. Communication Skills ↗
2. Detail-Oriented ↗
3. Work Independently ↗
4. Organizational Skills ↗
5. Data Analysis ↗
6. Troubleshooting ↗
7. Problem Solving ↗
8. Creativity ↗
9. Research ↗
10. Data Entry ↗

↗ *Rising Skills (+5% or more from 2015 to 2016)*

*Matches to CTE Foundation Knowledge/Skill*

Start thinking about your future in biotechnology systems by looking over the career opportunities below. It's never too early to start charting your course down an exciting new pathway! Talk to an academic navigator or visit the CTE website to explore! http://www.mncareerpathways.org/pathways/

| | Occupation | Job Titles | Total Job Count 2016 | Change from 2015 | Median Salary | Most common Education Level Requirement |
|---|---|---|---|---|---|---|
| Biotechnology Systems | Biological Technicians | Science Lab Assistant, Research Technician - Small Animal,Soybean Breeding Research Associate, Lab Tech, Microbiology Lab Technician, Veterinary Clinical Sciences - Genetics | 833 | 28% ↗ | $ 35,086 | Bachelor's Degree |
| | Chemical Technicians | Laboratory Assistant, Piloting Technician, Fiber Technician, Chromatography Technician | 284 | 9% ↗ | $ 33,059 | Bachelor's Degree |
| | Biological Science Teachers, Postsecondary | Biology Faculty, Life Science and Biology Teacher, Biochemistry Professor | 191 | -1% | $ 52,790 | Bachelor's Degree |
| | Chemists | Chemist, Fluids Chemist, Quality Control Chemist, Analytical Chemist | 188 | 48% ↗ | $ 63,271 | Bachelor's Degree |
| | Agricultural Inspectors | Food Inspector, Slaughter Inspector | 88 | 100% ↗ | $ 42,007 | Bachelor's Degree |
| | Microbiologists | Microbiologist, Product Development Microbiologist, Applied Microbiologist | 66 | 164% ↗ | $ 58,648 | Bachelor's Degree |
| | Chemical Engineers | Fermentation Process Team Member, Project Engineer Membrane Filtration, Animal Vaccine Research Engineer, Operations Engineer, Director of Biocatalyst Development | 60 | -56% | $ 89,446 | Bachelor's Degree |
| | Biomedical Engineers | Biomedical Engineer, Researcher 5, Surgical Device Development Engineer, Project Engineer | 55 | 31% ↗ | $ 86,986 | Bachelor's Degree |
| | Chemical Plant and System Operators | Utility Operator, Standardizer Operator, Ethanol Plant Operator, Pilot Plant Technician | 24 | -17% | $ 37,801 | GED/High School |
| | Materials Scientists | Research Scientist, Production Scientist | 15 | -6% | $ 80,667 | Bachelor's Degree |
| | Biologists | Biologist, Research Biologist, Plant Biologist | 12 | -37% | $ 69,167 | Doctoral Degree |
| | Biofuels Processing Technicians | Ethanol Plant Process Operator | 9 | -31% | $ 32,444 | Master's Degree |
| | Biochemists and Biophysicists | Biochemist, Biomining, Chemical Biology Scientist | 6 | 20% ↗ | $ 73,000 | Bachelor's Degree |
| | Bioinformatics Technicians | Informatics Specialist,Genome Analyst | 5 | 67% ↗ | $ 68,400 | Master's Degree |
| | Cytotechnologists | Ctyotechnologist | 3 | 50% ↗ | $ 58,418 | Bachelor's Degree |
| | Bioinformatics Scientists | Crop Bioinformatician, Bioinformatics Scientist, Data Standards Scientist | 2 | -33% | $ 90,000 | Doctoral Degree |
| | Biofuels Production Managers | Biofuels Production Manager | 1 | -92% | $ 127,000 | GED/High School |
| | Epidemiologists | Epidemiologist | 1 | -75% | $ 94,085 | Master's Degree |
| | Biomass Plant Technicians | Biomass Plant Tehcnician | 0 | 0% | N/A | Associate Level |
| | Biofuels/Biodiesel Technology and Product Development Managers | Dairy Research & Development Manager | 0 | 0% | N/A | GED/High School |
| | Biochemical Engineers | Biochemical Engineer | 0 | 0% | N/A | Bachelor's Degree |
| | Geneticists | Geneticist, Clinical Cytogeneticist, Population Geneticist, Research Geneticist | 0 | -100% | N/A | Doctoral Degree |

↗ *Rising Jobs (+5% or more from 2015 to 2016)* *Bright Future Jobs (DEED-identified)* *Green Jobs (DEED-identified)*

Data collected from online job postings between 2013 and 2016 from CEB TalentNeuron Recruit in January 2017 (www.wantedanalytics.com). Report developed by RealTime Talent February 2017 with the support of AgCentric, the Southern Minnesota Center for Agriculture, GreenSeam, AgriGrowth, the Minnesota Department of Agriculture, Career and Technical Education Consortium Leaders, and faculty from Minnesota State colleges and universities across the state.

## About RealTime Talent

RealTime Talent is a collaboration between public agencies, private industry, higher education, and workforce developers. We are focused on helping decision-makers better align our workforce with our growing economy. Since August 2015, we have trained more than 1,000 leaders across Minnesota to use real-time job posting data to help find solutions to our state's greatest workforce challenges. We are proud to be considered a "hub" for data innovation and exploration. Our four main areas of work for FY2017 include:

- Identify and evaluate new tools which bring efficiency to the "education to employment / re-employment" process
- Foster data use innovation through access to new data, development of reports and templates, and engaging users in best practices for comparing multiple data sources
- Provide customized, customer-centered research and reports upon request, each designed to support local or industry needs
- Provide training and technical assistance to ensure professionals across Minnesota have the capacity to use and share data and other resources.

RealTime Talent provides customized research and data analysis services to employers, non-profits, workforce centers, chambers of commerce, educators, and administrators to maximize learning from new data sources. Products include industry fact sheets, occupational snapshots, employer engagement strategizing, custom surveys, and job market analytics utilizing the real-time data tool TalentNeuron Recruit among other unique LMI data sources. Industry research has focused in healthcare, information technology, agriculture, construction, transportation and manufacturing.

Prepared By

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Based on Agriculture, Food and Natural Resources
Career Pathways from Minnesota State CTE

RealTime Talent
Using data to build the world's best workforce