**** **Biological Technicians**

**Labor Market Information Report**

Prepared by the San Francisco Center of Excellence

for Labor Market Research

October 2018

# Recommendation

Based on available secondary data, there appears to be an undersupply of Biological Technicians compared to the demand for this occupation in the Bay region, but in the North Bay sub-region (Marin, Napa, Solano and Sonoma counties) there appears to be an oversupply. The undersupply is about 310 students annually in the Bay region and the oversupply in the North Bay sub-region is about 30.

Solano Community College indicates in their labor market information request form that, “combined with our interaction with temporary agencies and with the biotech companies themselves, a projected shortage has a potential to be severe.  Based on the experience of City College of San Francisco, we believe that we can generate a very high placement rate. New approaches to therapies using stem cells are emerging - being talked about at conferences and in industry settings. For example, recently a speaker said that CAR-T cancer therapies will be a $250 million industry within 5 years. The point of this Stem Cells and Cell Based Technologies certificate is to get a jump on the technology.”

This report also provides student outcomes data on employment and earnings for programs on TOP 0430.00 - Biotechnology and Biomedical Technology in the state and region. It is recommended that this data be reviewed to better understand how outcomes for students taking courses on this TOP code compare to potentially similar programs at colleges in the state and region, as well as to outcomes across all CTE programs at Solano Community College and in the region.

# Introduction

This report profiles Biological Technicians in the 12 county Bay region and in the North Bay sub-region for a proposed new Stem Cells and Cell Based Technologies Certificate at Solano Community College.

|  |
| --- |
| * **Biological Technicians (SOC 19-4021):** Assist biological and medical scientists in laboratories. Set up, operate, and maintain laboratory instruments and equipment, monitor experiments, make observations, and calculate and record results. May analyze organic substances, such as blood, food, and drugs.
 |
| *Entry-Level Educational Requirement: Bachelor's degree* |
| *Training Requirement: None* |
| *Percentage of Community College Award Holders or Some Postsecondary Coursework: 35%* |

# Occupational Demand

**Table 1. Employment Outlook for Biological Technicians in Bay Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation  | 2017 Jobs | 2022 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Annual Open-ings | 10% Hourly Wage | Median Hourly Wage |
| Biological Technicians | 4,600 | 5,084 | 484  | 11% | 2,754 | 551 | $17.02  | $25.34  |

*Source: EMSI 2018.2*

**Bay Region** includes Alameda, Contra Costa, Marin, Monterey, Napa, San Benito, Solano, San Mateo, Santa Clara, Santa Cruz, Solano and Sonoma Counties

**Table 2. Employment Outlook for Biological Technicians in North Bay Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation  | 2017 Jobs | 2022 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Annual Open-ings | 10% Hourly Wage | Median Hourly Wage |
| Biological Technicians | 263 | 303 | 40  | 15% | 172 | 34 | $16.68  | $24.40  |

*Source: EMSI 2018.2*

**North Bay Sub-Region** includes Marin, Napa, Solano and Sonoma Counties

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### Job Postings in Bay Region and North Bay Sub-Region

**Table 3. Number of Job Postings by Occupation for latest 12 months (Sept 2017 - Aug 2018)**

|  |  |  |
| --- | --- | --- |
| Occupation | Bay Region | North Bay |
| Biological Technicians | 917 | 54 |

*Source: Burning Glass*

**Table 4. Top Job Titles for Biological Technicians for latest 12 months (Sept 2017 - Aug 2018)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Common Title | Bay | North Bay | Common Title | Bay | North Bay |
| Research Associate | 378 | 26 | Research Associate, Laboratory | 17 | 3 |
| Staff Research Associate | 57 |  | Research Associate, Engineering | 12 |  |
| Development Associate | 51 | 2 | Research Associate, Information And Technology Industry | 9 |  |
| Research Technician | 34 |  | Research Associate, Oncology, Research | 9 |  |
| Biological Science Technician | 27 | 11 | Biological Technician | 7 | 3 |
| Staff Research Associate, C++ | 22 |  | Associate Research Scientist | 6 |  |
| Senior Associate Research Associate, Research | 21 | 1 | Research Associate, Oncology | 6 |  |
| Senior Research Associate | 21 | 1 | Wildlife Technician | 6 |  |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring Biological Technicians in Bay Region**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Industry – 6 Digit NAICS (No. American Industry Classification) Codes | Jobs in Industry (2017) | Jobs in Industry (2022) | % Change (2017-22) | % in Industry (2017) |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 1,626 | 1,557 |  (4%) | 33.8% |
| Research and Development in Biotechnology (except Nano biotechnology) (541714) | 549 | 789 | 44% | 17.1% |
| Colleges, Universities, and Professional Schools (State Government) (902612) | 468 | 392 |  (16%) | 8.5% |
| Pharmaceutical Preparation Manufacturing (325412) | 357 | 347 |  (3%) | 7.5% |
| Colleges, Universities, and Professional Schools (611310) | 239 | 314 | 31% | 6.8% |
| Federal Government, Civilian, Excluding Postal Service (901199) | 184 | 174 |  (5%) | 3.8% |
| General Medical and Surgical Hospitals (622110) | 115 | 145 | 26% | 3.2% |
| Testing Laboratories (541380) | 147 | 134 |  (9%) | 2.9% |
| In-Vitro Diagnostic Substance Manufacturing (325413) | 38 | 64 | 68% | 1.4% |
| Local Government, Excluding Education and Hospitals (903999) | 57 | 63 | 11% | 1.4% |
| State Government, Excluding Education and Hospitals (902999) | 52 | 61 | 17% | 1.3% |
| Research and Development in Nanotechnology (541713) | 65 | 60 |  (8%) | 1.3% |
| Colleges, Universities, and Professional Schools (Local Government) (903612) | 40 | 56 | 40% | 1.2% |
| Medicinal and Botanical Manufacturing (325411) | 30 | 52 | 73% | 1.1% |

*Source: EMSI 2018.3*

**Table 6. Top Employers Posting Jobs for Biological Technicians in Bay Region and North Bay Sub-Region (Sept 2017 - Aug 2018)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employer | Bay | Employer | Bay | Employer | North Bay |
| UC San Diego | 32 | Department Interior | 11 | Biomarin Pharmaceutical Incorporated | 10 |
| University California | 24 | Zymergen | 11 | Buck Institute | 9 |
| Prime Therapeutics | 23 | Ascent | 9 | Department Interior | 6 |
| Gladstone Institutes | 21 | Fluidigm Corporation | 9 | US Government | 4 |
| Biophase Solutions Incorporated | 17 | US Government | 9 | Ascent | 2 |
| University Of California Berkeley | 17 | 10X Genomics | 8 | National Audubon Society | 2 |
| Bristol-Myers Squibb | 16 | Biomarin Pharmaceutical Incorporated | 10 | Ultragenyx Pharmaceutical | 2 |
| Ngm Biopharmaceuticals | 16 | Intrexon Corporation | 8 | Ascentiant International | 1 |
| Rd Partners | 13 | Aduro Biotech, Inc | 7 |  |  |
| Gilead Sciences | 12 | Bepc | 7 |  |  |

*Source: Burning Glass*

# Educational Supply

There are nine colleges in the Bay Region issuing 243 awards annually on TOP 0430.00 - Biotechnology and Biomedical Technology. Solano Community College is the only college in the North Bay sub-region with a program under this TOP Code, issuing 65 awards annually on average.

**Table 7. Awards on TOP 0430.00 - Biotechnology and Biomedical Technology in the Bay Area**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| College | Sub-Region | Headcount | Associates | Certificates | Total |
| Berkeley City | East Bay | 57 | 4 | 5 | 9 |
| Contra Costa | East Bay | 28 | 2 | 6 | 8 |
| Laney | East Bay | 96 | 9 | 41 | 50 |
| Merritt | East Bay | 177 |  | 3 | 3 |
| Ohlone | East Bay | 140 | 4 | 33 | 37 |
| San Francisco | Mid-Peninsula | 301 | 5 | 55 | 60 |
| San Mateo | Mid-Peninsula |  | 1 | 5 | 6 |
| Skyline | Mid-Peninsula | 52 | 4 | 1 | 5 |
| Solano | North Bay | 88 | 27 | 38 | 65 |
| **Total Bay Region** | **939** | **56** | **188** | **243** |
| **Total North Bay Sub-Region** | **88** | **27** | **38** | **65** |

# *Source: IPEDS, Data Mart and Launchboard*

NOTE: Headcount of students who took one or more courses is for 2016-17. The annual average for awards is 2014-17 unless there are only awards in 2016-17. The annual average for other postsecondary is for 2013-16.

# Gap Analysis

Based on the data included in this report, there is a labor market gap in the Bay region with 551annual openings for Biological Technicians and 243 annual awards for an annual undersupply of 308. In the North Bay, there appears to be an oversupply with 34 annual openings and 65 annual awards for an annual oversupply of 31.

# Student Outcomes

**Table 8. Four Employment Outcomes Metrics for Students Who Took Courses on TOP 0430.00 - Biotechnology and Biomedical Technology**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 2015-16 | Bay (All CTE Programs) | Solano (All CTE Programs) | State (TOP 0430.00) | Bay (TOP 0430.00) | North Bay (TOP 0430.00) | Solano (TOP 0430.00) |
| % Employed Four Quarters After Exit | 74% | 71% | 72% | 73% | 84% | 84% |
| Median Quarterly Earnings Two Quarters After Exit | $10,310 | $7,909 | $9,095 | $10,028 | $10,825 | $10,825 |
| Median % Change in Earnings | 46% | 53% | 79% | 104% | 363%(n=17) | 363%(n=17) |
| % of Students Earning a Living Wage | 63% | 49% | 54% | 57% | 59% | 59% |

*Source: Launchboard Pipeline (version available on 9/27/18)*

# Skills and Education

**Table 9. Top Skills for Biological Technicians in Bay Region (Sept 2017 - Aug 2018)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Skill | Postings | Skill | Postings | Skill | Postings |
| Molecular Biology | 544 | qPCR | 147 | Genetics | 77 |
| Experiments | 431 | Tissue Culture | 132 | Proteins | 74 |
| Biology | 363 | Microscope | 115 | Laboratory Equipment | 71 |
| Biochemistry | 355 | Assay Development | 112 | Quality Assurance and Control | 70 |
| Cell Culturing | 338 | Chemistry | 108 | Molecular Cloning | 69 |
| Cell Biology | 302 | Electrophoresis | 106 | Good Laboratory Practices (GLP) | 62 |
| Biotechnology | 263 | Fluorescence-activated cell sorting (FACS) | 101 | Prepare Compounds and Reagents | 62 |
| DNA | 241 | Next Generation Sequencing (NGS) | 97 | Protein Expression | 62 |
| Flow Cytometry | 240 | Genome | 96 | Drug Discovery | 58 |
| Immunology | 235 | Transfection | 92 | Genomics | 58 |
| Biochemical and Cell-Based Assays | 233 | Cancer knowledge | 89 | Immunohistochemistry | 57 |
| Enzyme-Linked Immunosorbent Assay (ELISA) | 201 | Oncology | 85 | Sterile Procedures / Techniques | 57 |
| Data Analysis | 193 | Microbiology | 82 | Gel Electrophoresis | 55 |
| Mammalian Cell Culture | 162 | CRISPR | 81 | High-Performance Liquid Chromatography (HPLC) | 55 |
| Western Blot | 150 | Record Keeping | 78 | Laboratory Procedures | 55 |

*Source: Burning Glass*

**Table 10. Education Requirements for Biological Technicians in Bay Region**

Note: 87% of records have been excluded because they do not include a degree level. As a result, the chart below may not be representative of the full sample.

|  |  |
| --- | --- |
| Education (minimum advertised) | Latest 12 Mos. Postings |
| High school or vocational training | 2 (1%) |
| Associate Degree | 119 (15%) |
| Bachelor’s Degree or Higher | 664 (84%) |

*Source: Burning Glass*

# Methodology

Occupations for this report were identified by use of skills listed in O\*Net descriptions and job descriptions in Burning Glass. Labor demand data is sourced from Economic Modeling Specialists International (EMSI) occupation data and Burning Glass job postings data. Educational supply and student outcomes data is retrieved from multiple sources, including CTE Launchboard and CCCCO Data Mart.

# Sources

O\*Net Online

Labor Insight/Jobs (Burning Glass)

Economic Modeling Specialists International (EMSI)

CTE LaunchBoard [www.calpassplus.org/Launchboard/](http://www.calpassplus.org/Launchboard/)

Statewide CTE Outcomes Survey

Employment Development Department Unemployment Insurance Dataset

Living Insight Center for Community Economic Development

Chancellor’s Office MIS system

# Contacts

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