** Biological Technicians**

**Labor Market Information Report**

**Merritt College**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

May 2019

# Recommendation

Based on all available data, there appears to be an undersupply of Biological Technicianscompared to the demand for this occupation in the Bay region and in the East Bay sub-region (Alameda and Contra Costa Counties.) There is a projected annual gap of about 301 students in the Bay region and 102 students in the East Bay Sub-Region.

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 these 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 Merritt College and in the region.

# Introduction

This report profiles Biological Techniciansin the 12 county Bay region and in the East Bay sub-region for two proposed new programs at Merritt College: Fluorescence Bioscience Microscopy and Optical Microscopy. *(Note: This labor market report can be used for both programs, when each is submitted to the BACCC, since the SOC code and TOP code are the same for both programs).*

|  |
| --- |
| * **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 | Average Annual Open-ings | 10% Hourly Wage | Median Hourly Wage |
| Biological Technicians | 4,496 | 4,959 | 463  | 10% | 2,716 | 543 | $16.69  | $25.60  |

*Source: EMSI 2019.2*

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

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

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Occupation  | 2017 Jobs | 2022 Jobs | 5-Yr Change | 5-Yr % Change | 5-Yr Open-ings | Average Annual Open-ings | 10% Hourly Wage | Median Hourly Wage |
| Biological Technicians | 1,777 | 1,917 | 141  | 8% | 1,025 | 208 | $16.20  | $23.99  |

*Source: EMSI 2019.2*

**East Bay Sub-Region** includes Alameda and Contra Costa Counties

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

**Table 3. Number of Job Postings by Occupation for latest 12 months (May 2018 - April 2019)**

| Occupation | Bay Region | East Bay |
| --- | --- | --- |
|  Biological Technicians | 1,399 | 369 |

*Source: Burning Glass*

**Table 4a. Top Job Titles for Biological Technicians for latest 12 months (May 2018 - April 2019) - Bay Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Bay | Common Title | Bay |
| Research Associate | 554 | Research Associate, Genome, Engineering | 8 |
| Development Associate | 103 | Research Associate, Flow Cytometry | 8 |
| Staff Research Associate | 64 | Research Associate, Drug Discovery | 8 |
| Research Technician | 57 | Medical Device Specialist, Microbiology | 8 |
| Senior Associate Research Associate, Research | 35 | Senior Research Associate, Virology | 7 |
| Research Associate, Laboratory | 33 | Research Associate, Production | 7 |
| Biological Science Technician | 30 | Research Associate, Pharmacology | 7 |
| Senior Research Associate | 27 | Research Associate, Oncology, Validation, Retail Industry | 7 |
| Staff Research Associate, C++ | 21 | Research Associate, Immunology | 7 |
| Research Associate, Engineering | 18 | Laboratory Technician | 7 |
| Research Associate, Information And Technology Industry | 12 | Senior Associate Research Associate, Research, Oncology | 6 |
| Senior Research Associate, Oncology | 10 | Science Research Associate | 6 |
| Research Associate, Cell Culturing | 10 | Biological Technician | 6 |
| Research Associate, Oncology | 9 | Associate Scientist, Research | 6 |

**Table 4.b Top Job Titles for Biological Technicians for latest 12 months (May 2018 - April 2019) - East Bay Sub-Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | East Bay | Common Title | East Bay |
| Research Associate | 140 | Research Associate, Product, Integration | 3 |
| Development Associate | 23 | Research Associate, Engineering | 3 |
| Staff Research Associate | 22 | Research Associate, Banking | 3 |
| Staff Research Associate, C++ | 21 | Medical Device Specialist, Microbiology | 3 |
| Research Technician | 20 | Laboratory Technician | 3 |
| Senior Associate Research Assc Research | 11 | Biomanufacturing Technician | 3 |
| Biological Science Technician | 7 | Associate Research Scientist, Oncology | 3 |
| Engineering Research Associate | 5 | Technical Leader, Microbiology,Solutions | 2 |
| Stem Cell Research Associate | 4 | Senior Associate Research Associate, Research, Biomarker | 2 |
| Research Associate, Genome, Engineering | 4 | Research Associate, Science, Immunology | 2 |
| Research Associate, Flow Cytometry | 4 | Research Associate, Library | 2 |
| Research Associate, Cell Culturing | 4 | Research Associate, High Throughput Screening ( Hts ) | 2 |
| Biological Technician | 4 | Research Associate, Engineering, Immunology | 2 |
| Senior Associate Engineering Research Associate, Research | 3 | Production Research Associate | 2 |

*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 (2018) | Jobs in Industry (2022) | % Change (2018-22) | % in Industry (2018) |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) (541715) | 1,595 | 1,541 |  (3.4%) | 34.2% |
| Research and Development in Biotechnology (except Nanobiotechnology) (541714) | 850 | 1,149 | 35.2% | 18.2% |
| Colleges, Universities, and Professional Schools (State Government) (902612) | 353 | 338 |  (4.2%) | 7.6% |
| Colleges, Universities, and Professional Schools (611310) | 325 | 343 | 5.5% | 7.0% |
| Pharmaceutical Preparation Manufacturing (325412) | 304 | 314 | 3.3% | 6.5% |
| Federal Government, Civilian, Excluding Postal Service (901199) | 164 | 160 |  (2.4%) | 3.5% |
| General Medical and Surgical Hospitals (622110) | 138 | 131 |  (5.1%) | 3.0% |
| Testing Laboratories (541380) | 131 | 130 |  (0.8%) | 2.8% |
| Medicinal and Botanical Manufacturing (325411) | 115 | 147 | 27.8% | 2.5% |
| State Government, Excluding Education and Hospitals (902999) | 67 | 70 | 4.5% | 1.4% |
| Colleges, Universities, and Professional Schools (Local Government) (903612) | 63 | 67 | 6.3% | 1.3% |
| Local Government, Excluding Education and Hospitals (903999) | 57 | 59 | 3.5% | 1.2% |
| In-Vitro Diagnostic Substance Manufacturing (325413) | 54 | 68 | 25.9% | 1.2% |
| Research and Development in Nanotechnology (541713) | 51 | 51 | 0.0% | 1.1% |

*Source: EMSI 2019.2*

**Table 6. Top Employers Posting Jobs for Biological Technicians in Bay Region and East Bay Sub-Region (May 2018 - April 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Employer | Bay | Employer | Bay | Employer | East Bay |
| Gladstone Institutes | 35 | Rd Partners | 10 | UC San Diego | 28 |
| Bristol-Myers Squibb | 34 | Orchard Therapeutics | 10 | University Of California Berkeley | 23 |
| Ngm Biopharmaceuticals | 29 | Fluidigm Corporation | 10 | Zymergen | 17 |
| University California | 28 | Ascent | 10 | University California | 14 |
| UC San Diego | 28 | Synthego | 9 | University Of California | 8 |
| Prime Therapeutics | 27 | Chan Zuckerberg Biohub | 9 | 10X Genomics | 8 |
| University Of Calif Berkeley | 23 | 10X Genomics | 9 | Gilead Sciences | 7 |
| Zymergen | 21 | Wild Type | 8 | Pivot Bio | 6 |
| Biomarin Pharmaceutical Incorporated | 21 | University Of California | 8 | Caribou Biosciences, Inc | 6 |
| Biophase Solutions Incorporated | 18 | UC San Francisco | 8 | Sangamo Therapeutics | 5 |
| Bepc | 16 | Twist Bioscience | 8 | Kite Pharma | 5 |
| Gilead Sciences | 15 | Bsi | 8 | US Government | 4 |
| University Of California San Francisco | 13 | Vir Biotechnology, Inc | 7 | Revance Therapeutics, Inc | 4 |
| Buck Institute | 13 | Pivot Bio | 7 | Quintara Discovery, Inc Qdi | 4 |
| US Government | 12 | Adicet Bio | 7 | Intellia Therapeutics | 4 |
| Department Interior | 11 | Zolon Tech Solutions Inc | 6 | Caribou Biosciences | 4 |
| Audentes Therapeutics | 11 | Stanford University | 6 | Bio-Rad Laboratories | 4 |

*Source: Burning Glass*

# Educational Supply

There are nine community colleges in the Bay Region issuing 242 awards on average annually (last 3 years) on TOP 0430.00 - Biotechnology and Biomedical Technology. There are five colleges in the East Bay Sub-Region issuing 106 awards on average annually (last 3 years) on this TOP code.

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| College | Sub-Region | Headcount | Associates | Certificates | Total |
| **Berkeley City** | East Bay | 57 | 4 | 4 | 8 |
| **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 | n/a | 1 | 5 | 6 |
| **Skyline** | Mid-Peninsula | 52 | 4 | 0 | 4 |
| **Solano** | North Bay | 88 | 27 | 38 | 65 |
| **Total Bay Region** |  **939**  |  **56**  |  **186**  |  **242**  |
| **Total East Bay Sub-Region** |  **498**  |  **19**  |  **87**  |  **106**  |

# *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 543 annual openings for Biological Technicians and 242 annual (3-year average) awards for an annual undersupply of 301 students. In the East Bay Sub-Region, there is also a gap with 208 annual openings and 106 annual (3-year average) awards for an annual undersupply of 102 students.

# 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) | Merritt College (All CTE Programs) | State (0430.00) | Bay (0430.00) | East Bay (0430.00) | Merritt College (0430.00) |
| % Employed Four Quarters After Exit | 74% | 71% | 72% | 73% | 66% | 67% |
| Median Quarterly Earnings Two Quarters After Exit | $10,550 | $9,306 | $9,134 | $9,871 | $9,228 | n/a |
| Median % Change in Earnings | 46% | 43% | 82% | 107% | 44% | n/a |
| % of Students Earning a Living Wage | 63% | 60% | 54% | 57% | 60% | n/a |

*Source: Launchboard Pipeline (version available on 5/16/19)*

# Skills and Education

**Table 9. Top Skills for Biological Technicians in Bay Region (May 2018 - April 2019)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Skill | Postings | Skill | Postings | Skill | Postings |
| Molecular Biology | 840 | qPCR | 241 | CRISPR | 120 |
| Experiments | 638 | Tissue Culture | 191 | Drug Discovery | 115 |
| Biology | 614 | Assay Development | 178 | Quality Assurance and Control | 114 |
| Cell Culturing | 570 | Fluorescence-activated cell sorting (FACS) | 173 | Protein Expression | 111 |
| Biochemistry | 526 | Chemistry | 171 | Prepare Compounds and Reagents | 111 |
| Cell Biology | 505 | Microscope | 167 | Molecular Cloning | 105 |
| Biochemical and Cell-Based Assays | 401 | Next Generation Sequencing (NGS) | 151 | Fluorescence | 99 |
| Flow Cytometry | 387 | Microbiology | 144 | Genetics | 97 |
| Biotechnology | 375 | Transfection | 139 | Protein Purification | 95 |
| DNA | 369 | Proteins | 137 | DNA Analysis | 89 |
| Immunology | 326 | Oncology | 136 | Sterile Procedures / Techniques | 88 |
| Enzyme-Linked Immunosorbent Assay (ELISA) | 311 | Cancer knowledge | 136 | Experimental Design | 87 |
| Data Analysis | 296 | Genome | 132 | Laboratory Equipment | 84 |
| Mammalian Cell Culture | 280 | Electrophoresis | 131 | Sodium Dodecyl Sulfate Polyacrylamide Gel Electrophoresis | 81 |
| Western Blot | 256 | Record Keeping | 124 | Good Laboratory Practices (GLP) | 81 |

*Source: Burning Glass*

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

Note: 12% 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 | Percent 12 Mos. Postings |
| High school or vocational training | 14 | 1% |
| Associate Degree | 158 | 13% |
| Bachelor’s Degree or Higher | 1,014 | 86% |

*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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