**Computational Biology Occupations**

**Labor Market Information Report**

**Las Positas** **College**

Prepared by the San Francisco Bay Center of Excellence

for Labor Market Research

November 2020

# Recommendation

Based on all available data, there appears to be an undersupply of Computational Biology workers compared to the demand for this cluster of occupations in the Bay region and in the East Bay sub-region (Alameda and Contra Costa Counties). There is a projected annual gap of about 3,071 students in the Bay region and 814 students in the East Bay Sub-Region.

**Introduction**

This report provides student outcomes data on employment and earnings for TOP 0430.00-Biotechnology and Biomedical Technology programs 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 Las Positas College and in the region.

This report profiles Computational Biology Occupations in the 12 county Bay region and in the East Bay sub-region for a proposed new program at Las Positas College.

|  |
| --- |
| * **Biological Technicians (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% |
|  |
| * **Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061):** Inspect, test, sort, sample, or weigh nonagricultural raw materials or processed, machined, fabricated, or assembled parts or products for defects, wear, and deviations from specifications. May use precision measuring instruments and complex test equipment.
 |
| Entry-Level Educational Requirement: High school diploma or equivalent |
| Training Requirement: Moderate-term on-the-job training |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 37% |
|  |
| * **Life, Physical, and Social Science Technicians, All Other (19-4099**): All life, physical, and social science technicians not listed separately.
 |
| Entry-Level Educational Requirement: Associate's degree |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 34% |
|  |
| * **Clinical Laboratory Technologists and Technicians (29-2018):** Perform routine medical laboratory tests for the diagnosis, treatment, and prevention of disease. May work under the supervision of a medical technologist.
 |
| Entry-Level Educational Requirement: Bachelor's degree |
| Training Requirement: None |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 0% |
|  |
| * **Medical Equipment Repairers (49-9062):** Test, adjust, or repair biomedical or electromedical equipment.
 |
| Entry-Level Educational Requirement: Associate's degree |
| Training Requirement: Moderate-term on-the-job training |
| Percentage of Community College Award Holders or Some Postsecondary Coursework: 49% |

**Occupational Demand**

**Table 1. Employment Outlook for Computational Biology Occupations in Bay Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Occupation**  | **2019 Jobs** | **2024 Jobs** | **5-Yr Change** | **5-Yr % Change** | **5-Yr Open-ings** | **Average Annual Open-ings** | **25% Hourly Wage** | **Median Hourly Wage** |
| Biological Technicians |  3,295  |  3,711  | 417 | 13% |  2,266  |  453  | $22.90 | $28.78 |
| Inspectors, Testers, Sorters, Samplers, and Weighers |  14,189  |  13,569  | -620 | -4% |  8,764  |  1,753  | $17.02 | $21.98 |
| Life, Physical, and Social Science Technicians, All Other |  2,780  |  2,982  | 202 | 7% |  1,921  |  384  | $21.85 | $28.17 |
| Clinical Laboratory Technologists and Technicians |  6,487  |  7,463  | 976 | 15% |  3,170  |  634  | $23.39 | $29.87 |
| Medical Equipment Repairers |  984  |  1,035  | 50 | 5% |  597  |  119  | $20.64 | $29.65 |
| **TOTAL** |  **27,735**  |  **28,759**  | **1,024** | **4%** |  **16,717**  |  **3,344**  | **$19.82** | **$25.52** |

*Source: EMSI 2020.3*

**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 Computational Biology Occupations in East Bay Sub-Region**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Occupation**  | **2019 Jobs** | **2024 Jobs** | **5-Yr Change** | **5-Yr % Change** | **5-Yr Open-ings** | **Average Annual Open-ings** | **25% Hourly Wage** | **Median Hourly Wage** |
| Biological Technicians |  622  |  733  | 111 | 18% |  468  |  94  | $20.14 | $25.28 |
| Inspectors, Testers, Sorters, Samplers, and Weighers |  3,956  |  3,856  | -101 | -3% |  2,450  |  490  | $16.26 | $20.76 |
| Life, Physical, and Social Science Technicians, All Other |  777  |  815  | 38 | 5% |  513  |  103  | $19.52 | $24.48 |
| Clinical Laboratory Technologists and Technicians |  2,231  |  2,422  | 192 | 9% |  924  |  185  | $21.89 | $27.91 |
| Medical Equipment Repairers |  238  |  254  | 16 | 7% |  146  |  29  | $21.30 | $28.33 |
| **TOTAL** |  **7,823**  |  **8,080**  | **256** | **3%** |  **4,501**  |  **900**  | **$18.65** | **$23.76** |

*Source: EMSI 2020.3*

**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 (October 2019 - September 2020)**

| **Occupation** | **Bay Region** | **East Bay** **Sub-Region** |
| --- | --- | --- |
| Inspectors, Testers, Sorters, Samplers, and Weighers | 4,651 | 1,676 |
| Medical and Clinical Laboratory Technicians | 4,266 | 1,285 |
| Quality Control Analysts | 2,704 | 832 |
| Biological Technicians | 1,506 | 312 |
| Medical Equipment Repairers | 399 | 148 |
| Life, Physical, and Social Science Technicians, All Other | 65 | 18 |
| Remote Sensing Technicians | 26 | 8 |
| Precision Agriculture Technicians | 10 | 2 |
|  **TOTAL** | **13,627** | **4,281** |

*Source: Burning Glass*

**Table 4a. Top Job Titles for Computational Biology Occupations for latest 12 months (October 2019 - September 2020) Bay Region**

|  |  |  |  |
| --- | --- | --- | --- |
| Common Title | Bay | Common Title | Bay |
| Laboratory Technician | 714 | Warehousing Sorter | 113 |
| Quality Inspector | 362 | Qc Technician | 109 |
| Research Associate | 257 | Qc Inspector | 102 |
| Quality Assurance Technician | 252 | Quality Assurance Inspector | 97 |
| Telemetry | 248 | Research Associate II | 93 |
| Quality Control Inspector | 248 | Sorter | 84 |
| Quality Assurance Specialist | 220 | Quality Analyst | 84 |
| Laboratory Assistant | 202 | Quality Systems Specialist | 67 |
| Test Engineer | 162 | Research Associate I | 66 |
| Crisis Rates Telemetry | 159 | Qc Analyst II | 56 |
| Warehousing Sorter Seasonal | 143 | Qc Analyst | 56 |
| Quality Control Technician | 143 | Quality Assurance/Qc Inspector | 53 |
| Product Tester Home - Req | 128 | Quality Specialist | 50 |
| Quality Technician | 114 | Laboratory Technician II | 48 |

**Table 4b. Top Job Titles for Computational Biology Occupations for latest 12 months (October 2019 - September 2020) East Bay Sub-Region**

|  |  |  |  |
| --- | --- | --- | --- |
| **Common Title** | **East Bay** | **Common Title** | **East Bay** |
| Laboratory Technician | 216 | Sorter | 42 |
| Quality Inspector | 152 | Product Tester Home - Req | 40 |
| Quality Control Inspector | 98 | Quality Technician | 35 |
| Quality Assurance Technician | 96 | Test Engineer | 31 |
| Telemetry | 81 | Quality Systems Specialist | 31 |
| Laboratory Assistant | 75 | Quality Assurance Inspector | 30 |
| Warehousing Sorter Seasonal | 72 | Quality Control | 26 |
| Qc Technician | 60 | Laboratory Assistant II | 24 |
| Quality Control Technician | 55 | Inspection Coordinator | 23 |
| Quality Assurance Specialist | 55 | Laboratory Technician II | 21 |
| Crisis Rates Telemetry | 54 | Laboratory Technician I | 21 |
| Research Associate | 50 | Qc Analyst | 20 |
| Warehousing Sorter | 47 | Research Associate II | 18 |
| Qc Inspector | 43 | Quality Inspector II | 16 |

*Source: Burning Glass*

# Industry Concentration

**Table 5. Industries hiring Computational Biology Workers in Bay Region**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Industry – 6 Digit NAICS (No. American Industry Classification) Codes** | **Jobs in Industry (2019)** | **Jobs in Industry (2024)** | **% Change (2019-24)** | **% Occupation Group in Industry (2019)** |
| Research and Development in the Physical, Engineering, and Life Sciences (except Nanotechnology and Biotechnology) | 2,386 |  2,657  | 11% | 9% |
| General Medical and Surgical Hospitals | 1,812 |  1,748  | -4% | 7% |
| Medical Laboratories | 1,394 |  1,785  | 28% | 5% |
| Research and Development in Biotechnology (except Nanobiotechnology) | 1,338 |  1,713  | 28% | 5% |
| Semiconductor and Related Device Manufacturing | 1,062 |  894  | -16% | 4% |
| Temporary Help Services | 1,027 |  983  | -4% | 4% |
| Pharmaceutical Preparation Manufacturing | 1,022 |  877  | -14% | 4% |
| Testing Laboratories | 761 |  723  | -5% | 3% |
| Electronic Computer Manufacturing | 724 |  707  | -2% | 3% |
| HMO Medical Centers | 636 |  811  | 28% | 2% |
| Hospitals (Local Government) | 611 |  669  | 9% | 2% |
| Colleges, Universities, and Professional Schools (State Government) | 598 |  593  | -1% | 2% |
| Colleges, Universities, and Professional Schools | 519 |  573  | 10% | 2% |
| Diagnostic Imaging Centers | 397 |  484  | 22% | 1% |
| Surgical and Medical Instrument Manufacturing | 365 |  382  | 5% | 1% |

*Source: EMSI 2020.3*

**Table 6. Top Employers Posting Computational Biology Occupations in Bay Region and East Bay Sub-Region (October 2019 - September 2020)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Employer** | **Bay** | **Employer** | **Bay** | **Employer** | **East** Bay |
| Amazon | 329 | Bio-Rad Laboratories | 44 | Amazon | 120 |
| Healthcare Travelers | 123 | Stanford University | 42 | UC Berkeley | 73 |
| American Consumer Panels | 103 | Metabyte Incorporated | 40 | Healthcare Travelers | 44 |
| Kelly | 100 | Fountain Group | 40 | Kelly | 43 |
| Stanford Health Care | 95 | Apidel Technologies | 40 | Bio-Rad Laboratories | 41 |
| Sutter Health | 91 | Fusion Technical Solutions | 37 | American Consumer Panels | 41 |
| University California | 80 | Day & Zimmermann Incorporated | 37 | Kaiser Permanente | 40 |
| Kaiser Permanente | 79 | Boehringer Ingelheim | 37 | Sutter Health | 34 |
| Ascent Technology Services | 76 | Pacific Gas and Electric Co | 36 | Boehringer Ingelheim | 34 |
| UC Berkeley | 75 | Abbott Laboratories | 36 | Eurofins Scientific | 28 |
| Dignity Health | 63 | Sanmina Corporation | 33 | Alta Bates Summit | 28 |
| Eurofins Scientific | 58 | Laboratory Corporation of America | 33 | Lawrence Livermore National Laboratory | 27 |
| Sutter Health Sacramento Sierra Region | 56 | Indotronix International Corp | 33 | Tesla | 26 |
| Sutter Medical Center | 55 | Zolon Tech Solutions Inc | 32 | Jabil Circuit | 24 |
| Tesla | 53 | Pact Pharma | 30 | Sutter Health Sacramento Sierra Region | 20 |
| University Of California San Francisco | 49 | Jabil Circuit | 30 | Pacific Gas and Electric Company | 20 |
| Integrated Resources Incorporated | 47 | Genentech | 30 | Bayer Corporation | 20 |

*Source: Burning Glass*

# Educational Supply

There are nine (9) community colleges in the Bay Region issuing 177 awards on average annually (last 3 years ending 2018-19) on TOP 0430.00-Biotechnology and Biomedical Technology. There are five (5) colleges in the East Bay Sub-Region issuing 85 awards on average annually (last 3 years) on this TOP code.

There are three (3) other institutions in the Bay Region issuing 96 Bachelor’s Degrees on TOP 0430.00-Biotechnology and Biomedical Technology. There is one (1) other institution in the East Bay Sub-Region issuing one (1) Bachelor’s Degree on this TOP code.

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

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| College | Sub-Region | Associates | Bachelors | Certificate Low Unit | Total |
| Berkeley City | East Bay | 4 |  | 4 | 8 |
| Contra Costa | East Bay | 2 |  | 5 | 7 |
| Laney | East Bay | 9 |  | 29 | 38 |
| Merritt | East Bay |  |  | 7 | 7 |
| Ohlone | East Bay | 7 |  | 18 | 25 |
| San Francisco | Mid-Peninsula | 4 |  | 33 | 37 |
| San Mateo | Mid-Peninsula | 2 |  | 8 | 10 |
| Skyline | Mid-Peninsula | 1 |  | 1 | 2 |
| Solano | North Bay | 22 | 4 | 17 | 43 |
| **Total Bay Region** | **51** | **4** | **122** | **177** |
| **Total East Bay Sub-Region** | **22** | **0** | **63** | **85** |

# Source: Data Mart

Note: The annual average for awards is 2016-17 to 2018-19.

**Table 7b. Bachelor’s Degree Awards on TOP 0430.00-Biotechnology and Biomedical Technology in Bay Region**

|  |  |  |
| --- | --- | --- |
| **College** | **Sub-Region** | **Bachelor’s Degree** |
| Pacific Union College | North Bay | 1 |
| Saint Mary's College of California | East Bay | 1 |
| University of California-Santa Cruz | SC - Monterey | 94 |
| **Total Bay Region** | **96** |
| **Total East** **Bay Sub-Region** | **1** |

# Source: Data Mart

Note: The annual average for awards is 2014-15 to 2016-17.

# Gap Analysis

Based on the data included in this report, there is a large labor market gap in the Bay region with 3,344 annual openings for the Computational Biology occupational cluster and 273 annual (3-year average) awards for an annual undersupply of 3,071 students. In the East Bay Sub-Region, there is also a gap with 900 annual openings and 86 annual (3-year average) awards for an annual undersupply of 814 students.

# Student Outcomes

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

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **2017-18** | **Bay** All CTE Programs | **Las Positas** **College** All CTE Programs | **State** 0430.00 | **Bay** 0430.00 | **East** **Bay** 0430.00 | **Las Positas** **College** 0430.00 |
| % Employed Four Quarters After Exit | 74% | 70% | 67% | 73% | 72% | n/a |
| Median Quarterly Earnings Two Quarters After Exit | $10,550 | $11,069 | $10,334 | $11,454 | n/a | n/a |
| Median % Change in Earnings | 46% | 30% | 36% | 40% | 35% | n/a |
| % of Students Earning a Living Wage | 63% | 52% | 56% | 53% | 56% | n/a |

*Source: Launchboard Pipeline (version available on (10/22/20)*

# Skills, Certifications and Education

**Table 9. Top Skills for Computational** **Biology Occupations in Bay Region (October 2019 - September 2020)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Skill** | **Postings** | **Skill** | **Postings** | **Skill** | **Postings** |
| Quality Assurance and Control | 5,312 | Repair | 905 | Oncology | 566 |
| Quality Management | 1,717 | Current Good Manufacturing Practices (CGMP) | 882 | Good Laboratory Practices (GLP) | 564 |
| Good Manufacturing Practices  | 1,547 | Laboratory Equipment | 803 | Cell Biology | 548 |
| Chemistry | 1,490 | Cell Culturing | 761 | Flow Cytometry | 544 |
| Biology | 1,309 | Microbiology | 740 | Laboratory Testing | 522 |
| Molecular Biology | 1,233 | Record Keeping | 716 | Telemetry | 521 |
| Experiments | 1,201 | DNA | 713 | Acute Care | 516 |
| Scheduling | 1,193 | Packaging | 697 | Biochemical and Cell-Based Assays | 507 |
| Data Entry | 1,139 | Micrometers | 659 | Lifting Ability | 501 |
| Biochemistry | 1,129 | Data Analysis | 654 | Advanced Cardiac Life Support (ACLS) | 496 |
| Biotechnology | 1,128 | Calipers | 652 | Manufacturing Processes | 489 |
| Calibration | 953 | Customer Service | 623 | Patient Care | 482 |
| Microscope | 930 | Sorting | 573 | Catheterization Laboratory (CATH LAB) | 481 |

*Source: Burning Glass*

**Table 10. Certifications for Computational Biology Occupations in Bay Region (October 2019 - September 2020)**

Note: 79% of records have been excluded because they do not include a certification. As a result, the chart below may not be representative of the full sample.

|  |  |  |  |
| --- | --- | --- | --- |
| **Certification** | **Postings** | **Certification** | **Postings** |
| Driver's License | 800 | Basic Cardiac Life Support Certification | 80 |
| Advanced Cardiac Life Support (ACLS)  | 497 | Certified Quality Engineer (CQE) | 69 |
| Critical Care Registered Nurse (CCRN) | 402 | American Registry of Radiologic Technologists (ARRT) Certification | 53 |
| Phlebotomy Certification | 271 | Clinical Laboratory Scientist (ClS) | 52 |
| Basic Life Saving (BLS) | 178 | Certified Meeting Planner | 39 |
| American Society For Quality (ASQ) Certification | 137 | American Society For Clinical Pathology (ASCP) Certification | 37 |
| IPC Certification | 135 | Project Management Certification | 35 |
| First Aid Cpr Aed | 123 | Certified Outpatient Coding (COC) | 35 |
| Security Clearance | 121 | Certified Welding Inspector (CWI) | 33 |
| American Heart Association Certification | 96 | Certified Veterinary Technician | 30 |
| Certified Quality Auditor (CQA) | 90 | Registered Nurse | 28 |
| Certified Medical Laboratory Technician | 87 | Certified Quality Technician (CQT) | 26 |

*Source: Burning Glass*

**Table 11. Education Requirements for Computational Biology Occupations in Bay Region**

|  |  |  |
| --- | --- | --- |
| **Education (minimum advertised)** | **Latest 12 Mos. Postings** | **Percent 12 Mos. Postings** |
| High school or vocational training | 3,640 | 40% |
| Associate Degree | 866 | 10% |
| Bachelor’s Degree or Higher | 4,273 | 50% |

*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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