










Biotechnology Occupations

Labor Market Analysis: San Diego County

November 2024

Summary

NEW PROGRAM RECOMMENDATION?	EVIDENCE OF A SUPPLY GAP?	AT OR ABOVE THE LIVING WAGE?	EXPECTED LEVEL(S) OF EDUCATION
 Proceed with Caution	 	 	<input type="checkbox"/> Doctorate Degree <input type="checkbox"/> Master's Degree <input checked="" type="checkbox"/> Bachelor's Degree <input checked="" type="checkbox"/> Associate Degree <input type="checkbox"/> Some College or Certificate <input checked="" type="checkbox"/> HS Diploma or Equivalent <input type="checkbox"/> Less Than a HS Diploma <input type="checkbox"/> Apprenticeship
SUPPORT FOR PROGRAM MODIFICATION?	NUMBER OF INSTITUTIONS THAT PROVIDE TRAINING	NUMBER OF ANNUAL JOB OPENINGS	
 	<div style="background-color: #0056b3; color: white; padding: 2px; text-align: center; font-weight: bold;">HIGH</div> 	<div style="background-color: #0056b3; color: white; padding: 2px; text-align: center; font-weight: bold;">HIGH</div> 	

The San Diego & Imperial Center of Excellence (COE) developed this brief to assist the region’s community colleges with program development. *Biotechnology Occupations* include “Biological Technicians,” “Clinical Laboratory Technologists and Technicians,” “Inspectors, Testers, Sorters, Samplers, and Weighers,” and “Life, Physical, and Social Science Technicians, All Other.” According to available data, *Biotechnology Occupations* in San Diego County have a labor market demand of 1,585 annual job openings (while average demand for a single occupation in San Diego County is 289 annual job openings), and 10 institutions supply 290 awards for these occupations, suggesting that there is a supply gap in the labor market. Data from the California Employment Development Department (EDD) and U.S. Bureau of Labor Statistics (BLS) show that entry-level earnings for *Biotechnology Occupations* average \$22.94 per hour—below San Diego County’s living wage of \$26.01 per hour. However, in online job postings, the median advertised wage rose from \$21 per hour in 2021 to \$28 per hour in 2023. This trend suggests that employers may be raising wages, a shift not fully captured in historical data. This brief recommends proceeding with caution when developing a new program but supports a program modification because these occupations’ average entry-level wages appear below the living wage, however there is a supply gap in the region, and a high number of annual openings exist for these occupations.

Introduction

This report provides labor market information in San Diego County for the following occupational code in the Standard Occupational Classification (SOC)¹ system:

- **Biological Technicians** (SOC 19-4021): Assist biological and medical scientists. Set up, operate, and maintain laboratory instruments and equipment, monitor experiments, collect data and samples, make observations, and calculate and record results. May analyze organic substances, such as blood, food, and drugs.
- **Clinical Laboratory Technologists and Technicians** (SOC 29-2018): Perform routine and complex medical laboratory tests for diagnosis, treatment, and prevention of disease. May train or supervise staff.
- **Inspectors, Testers, Sorters, Samplers, and Weighers** (SOC 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.
- **Life, Physical, and Social Science Technicians, All Other** (SOC 19-4099): All life, physical, and social science technicians not listed separately.

For the purpose of this report, these occupations are referred to as *Biotechnology Occupations*.

¹ The Standard Occupational Classification (SOC) system is used by federal statistical agencies to classify workers into occupational categories for the purpose of collecting, calculating or disseminating data. [bls.gov/soc/](https://www.bls.gov/soc/).

Projected Occupational Demand

Between 2023 and 2028, employers in San Diego County will need to hire 1,585 workers annually to fill new jobs and backfill jobs in *Biotechnology Occupations* due to attrition caused by turnover and retirement, for example (Exhibit 1). “Inspectors, Testers, Sorters, Samplers, and Weighers” are projected to have the most labor market demand between 2023 and 2028, with 669 annual job openings.

Exhibit 1: Number of Jobs for *Biotechnology Occupations* (2023-2028)²

Occupational Title	2023 Jobs	2028 Jobs	2023 - 2028 Net Jobs Change	2023 - 2028 % Net Jobs Change	Annual Job Openings (Demand)
Inspectors, Testers, Sorters, Samplers, and Weighers	5,609	5,719	110	2%	669
Biological Technicians	2,741	2,933	192	7%	385
Life, Physical, and Social Science Technicians, All Other	1,986	2,138	152	8%	280
Clinical Laboratory Technologists and Technicians	2,995	3,265	270	9%	251
Total	13,331	14,055	724	5%	1,585

Earnings

According to traditional³ labor market information (LMI), entry-level hourly earnings for *Biotechnology Occupations* range from \$20.83 to \$24.67 (Exhibit 2).

Exhibit 2: Hourly Earnings for *Biotechnology Occupations* in San Diego County⁴

Occupational Title	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Life, Physical, and Social Science Technicians, All Other	\$24.67	\$32.29	\$39.28
Clinical Laboratory Technologists and Technicians	\$23.18	\$30.76	\$37.83
Biological Technicians	\$23.09	\$28.45	\$35.31
Inspectors, Testers, Sorters, Samplers, and Weighers	\$20.83	\$25.02	\$31.67

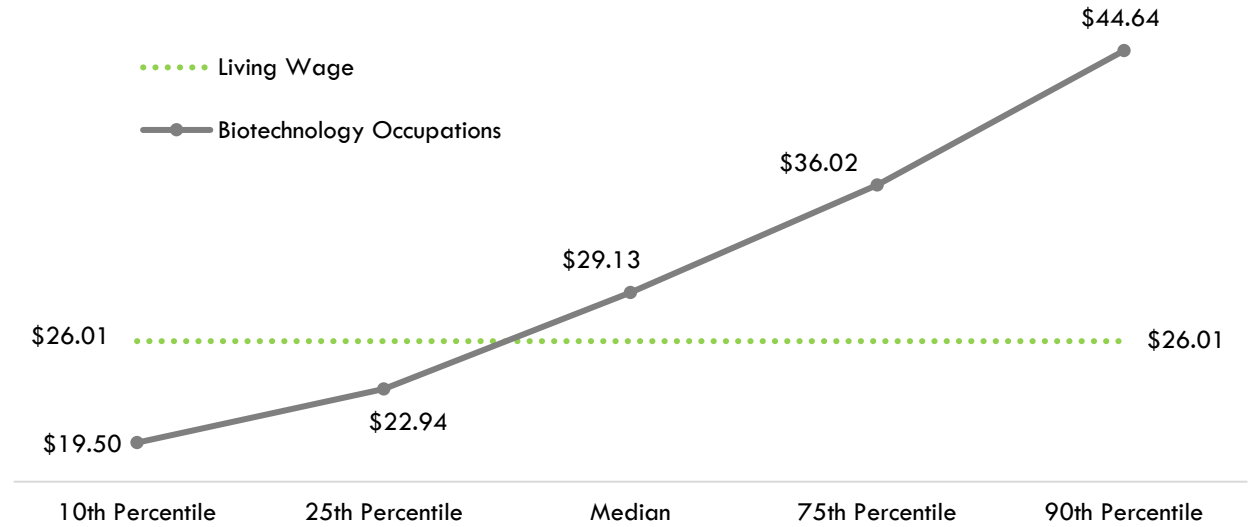
² Lightcast 2024.03; QCEW, Non-QCEW, Self-Employed.

³ Traditional LMI is generally historical data captured by the U.S. Bureau of Labor Statistics (BLS) or the California Employment Development Department (EDD). It does not account for recent technological, economic, or legislative changes that may affect labor market demand and wages.

⁴ Lightcast 2024.03; QCEW, Non-QCEW, Self-Employed.

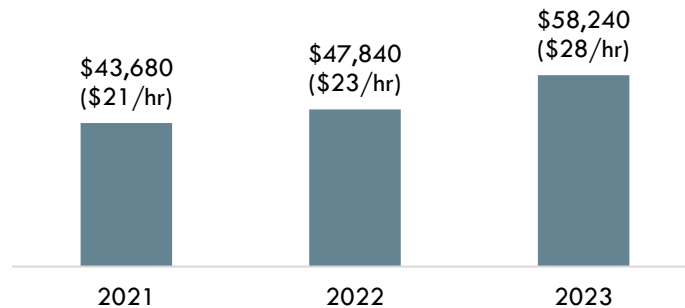
On average, the entry-level hourly earnings are \$22.94—or \$47,715.20 annual salary⁵; this is less than the living wage for a single adult in San Diego County, which is \$26.01 per hour (Exhibit 3).⁶

Exhibit 3: Hourly Earnings⁷ for Biotechnology Occupations in San Diego County⁸



In 2021, the median advertised wage was \$21 per hour in online job postings for *Biotechnology Occupations* in San Diego County (Exhibit 4).⁹ In 2023, the median advertised salary increased to \$28 per hour.

Exhibit 4: Median Advertised Salaries in Online Job Postings for *Biotechnology Occupations* in San Diego County (2021-2023)*



*Hourly wages are rounded to the nearest dollar amount.

⁵ Annualized salaries assume a full-time position with 2,080 hours. Multiplying the hourly wage with 2,080 yields the annual salary.

⁶ Center for Women's Welfare, University of Washington. (2024). The self-sufficiency standard for California 2024. selfsufficiencystandard.org/California.

⁷ 10th and 25th percentiles could be considered entry-level wages, and 75th and 90th percentiles could be considered experienced wages for individuals who may have been in the occupation longer, received more training than others, etc.

⁸ Lightcast 2024.03; QCEW, Non-QCEW, Self-Employed.

⁹ Lightcast 2024.03; "Job Posting Analytics." 2021-2023.

Expected Level of Education

According to traditional LMI, *Biotechnology Occupations* have a national educational attainment ranging from [high school diploma or equivalent](#) to a [bachelor's degree](#)¹⁰ (Exhibit 5).

Exhibit 5: National Educational Attainment for *Biotechnology Occupations*¹¹

Occupational Title	Typical Entry-Level Education
Clinical Laboratory Technologists and Technicians	Bachelor's degree
Biological Technicians	Bachelor's degree
Life, Physical, and Social Science Technicians, All Other	Associate degree
Inspectors, Testers, Sorters, Samplers, and Weighers	High school diploma or equivalent

Similarly, online job postings between January 1, 2021 and December 31, 2023 in San Diego County had a [high school diploma or equivalent](#) as the most requested educational requirement for *Biotechnology Occupations*; however, employers also expected the following certifications (Exhibit 6).¹²

Exhibit 6: Top Certifications for *Biotechnology Occupations* in San Diego County in Online Job Postings (2021-2023)¹³

1. American Society for Clinical Pathology (ASCP) Certification
2. Basic Life Support (BLS) Certification
3. American Medical Technologists (AMT) Certification
4. Clinical Laboratory Scientist License (CLS)
5. Certified Phlebotomy Technician
6. Security Clearance
7. Basic Cardiac Life Support
8. Certified Lodging Security Supervisor
9. Advanced Cardiovascular Life Support (ACLS) Certification
10. American Society for Quality (ASQ) Certified
11. Phlebotomy Certification
12. Neonatal Resuscitation Program Certification (NRP)
13. Certified Histotechnician (HT-ASCP)
14. Cardiopulmonary Resuscitation (CPR) Certification
15. Functional Skills Qualification

¹⁰ Lightcast 2024.03; QCEW, Non-QCEW, Self-Employed.

¹¹ Lightcast 2024.03; QCEW, Non-QCEW, Self-Employed.

¹² Lightcast 2024.03; "Job Posting Analytics." 2021-2023.

¹³ Lightcast 2024.03; "Job Posting Analytics." 2021-2023.

Educational Supply

Educational supply for an occupation can be estimated by analyzing the number of awards in related Taxonomy of Programs (TOP) or Classification of Instructional Programs (CIP) codes. There are **five** TOP codes and **seven** CIP codes related to *Biotechnology Occupations* (Exhibit 7).

Exhibit 7: Related TOP and CIP Codes for *Biotechnology Occupations*¹⁴

TOP or CIP Code	TOP or CIP Program Title
TOP 0403.00	MicroBiology
TOP 0430.00	Biotechnology and Biomedical Technology
TOP 0955.00	Laboratory Science Technology
TOP 0956.80	Industrial Quality Control
TOP 1205.00	Medical Laboratory Technology
CIP 15.0702	Quality Control Technology/Technician
CIP 26.0502	Microbiology, General
CIP 26.1104	Computational Biology
CIP 41.0101	Biology/Biotechnology Technology/Technician
CIP 41.9999	Science Technologies/Technicians, Other
CIP 51.1004	Clinical/Medical Laboratory Technician
CIP 51.1099	Clinical/Medical Laboratory Science and Allied Professions, Other

According to TOP data, **eight** community colleges supply the region with awards for these occupations: *Cuyamaca College, Grossmont College, MiraCosta College, Palomar College, San Diego City, San Diego Mesa College, San Diego Miramar and Southwestern College*. According to CIP data, **two** non-community-college institutions supply the region with awards: *San Diego State University and University of California-San Diego* (Exhibit 8).

¹⁴ This brief uses a conservative estimate of program supply and only calculates awards from the TOP code listed in Exhibit 7.

**Exhibit 8: Number of Awards (Certificates and Degrees) Conferred by Postsecondary Institutions
(Program Year 2019-20 Through Program Year 2022-23 Average)**

TOP6 or CIP Code	TOP6 or CIP Program Title	3-Yr Annual Average CC Awards (PY20-21 to PY22-23)	Other Educational Institutions 3-Yr Annual Average Awards (PY19-20 to PY21-22)	Total Average Supply (PY19-20 to PY22-23)
0430.00	Biotechnology and Biomedical Technology	184	0	184
	MiraCosta	89	0	
	• Bachelor's Degree	12	0	
	• Associate Degree	22	0	
	• Certificate 30 < 60 units	23	0	
	• Certificate 8 < 16 units	21	0	
	• Certificate 6 < 18 units	11	0	
	San Diego City	0	0	
	• Associate Degree	0	0	
	San Diego Mesa	0	0	
	• Associate Degree	0	0	
	San Diego Miramar	95	0	
	• Associate Degree	71	0	
	• Certificate 6 < 18 units	24	0	
	Southwestern	0	0	
• Associate Degree	0	0		
1205.00	Medical Laboratory Technology	29	0	29
	San Diego Miramar	20	0	
	• Associate Degree	13	0	
	• Certificate 16 < 30 units	7	0	
	Southwestern	9	0	
	• Associate Degree	9	0	
26.0502	Microbiology, General	0	77	77
	San Diego State University	0	28	
	• Bachelor's degree	0	27	
	• Master's degree	0	1	

TOP6 or CIP Code	TOP6 or CIP Program Title	3-Yr Annual Average CC Awards (PY20-21 to PY22-23)	Other Educational Institutions 3-Yr Annual Average Awards (PY19-20 to PY21-22)	Total Average Supply (PY19-20 to PY22-23)
	University of California-San Diego	0	49	
	• Bachelor's degree	0	49	
			Total	290

Demand vs. Supply

Comparing labor demand (annual openings) with labor supply¹⁵ suggests that there is a supply gap for these occupations in San Diego County, with 1,585 annual openings and 290 awards. Comparatively, there are 13,383 annual openings in California and 1,100 awards, suggesting that there is a supply gap across the state¹⁶ (Exhibit 9).

Exhibit 9: Labor Demand (Annual Openings) Compared with Labor Supply (Average Annual Awards)

	Demand (Annual Openings)	Supply (Annual Awards)	Supply Gap or Oversupply
San Diego	1,585	290	1,295
California	13,383	1,100	12,283

Please note: This is a basic analysis of supply and demand of labor. The data does not include workers currently in the labor force who could fill these positions or workers who are not captured by publicly available data. This data should be used to discuss the potential gaps or oversupply of workers; however, it should not be the only basis for determining whether or not a program should be developed.

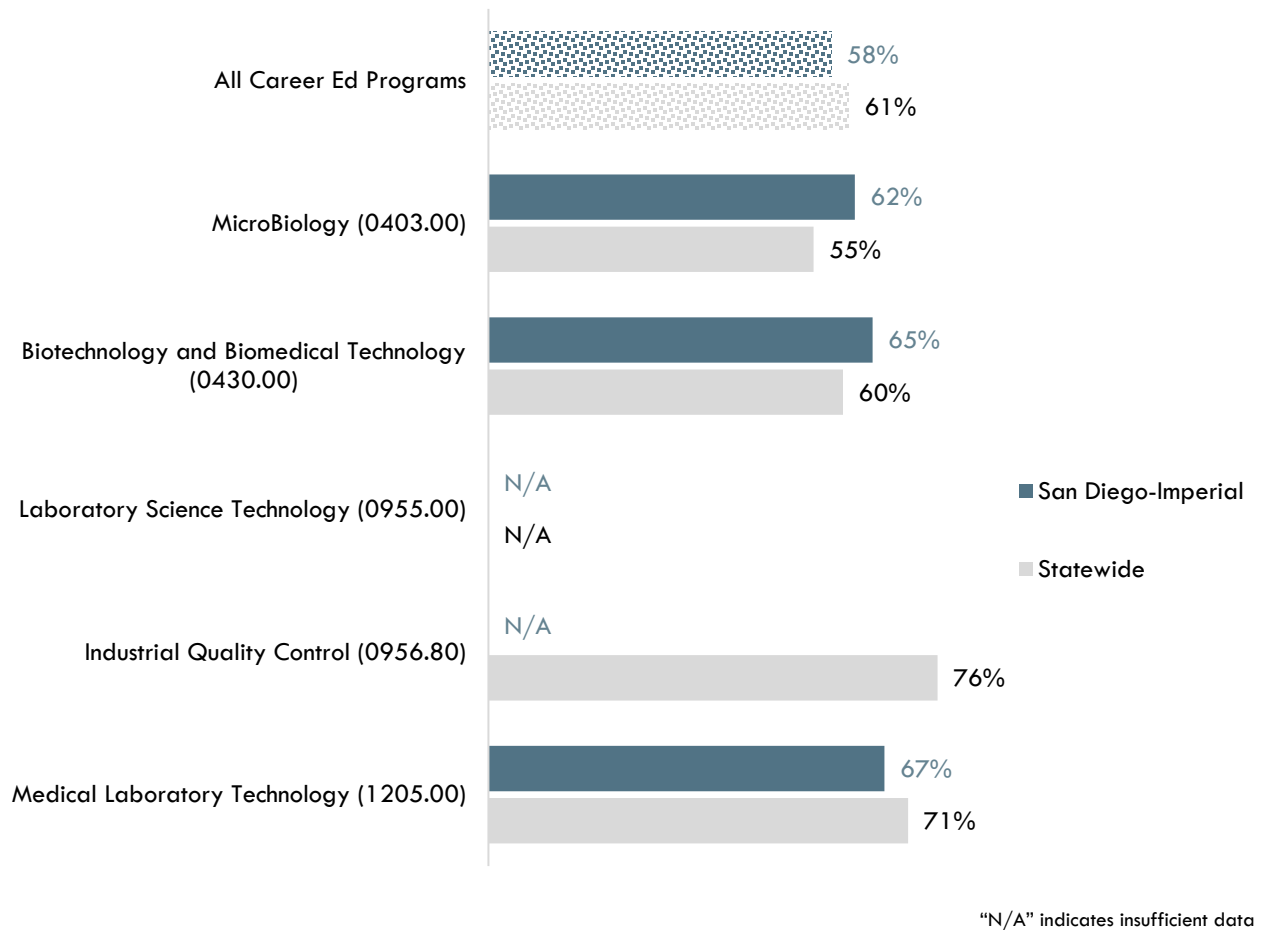
¹⁵ Labor supply can be found from two different sources: Lightcast or the California Community Colleges Chancellor's Office MIS Data Mart. Lightcast uses CIP codes while MIS uses TOP codes. Different coding systems result in differences in the supply numbers.

¹⁶ "Supply and Demand," Centers of Excellence Student Outcomes, coecc.net/our-resources.

Student Outcomes and Regional Comparisons

According to the California Community Colleges DataVista, 62 to 67 percent of students in the San Diego-Imperial region earned a living wage after completing a program related to *Biotechnology Occupations*, compared 55 to 76 percent statewide and 61 percent of students in Career Education programs in general across the state (Exhibit 10).¹⁷

Exhibit 10: Percentage of Students Who Earned a Living Wage by Program, PY2021-22¹⁸

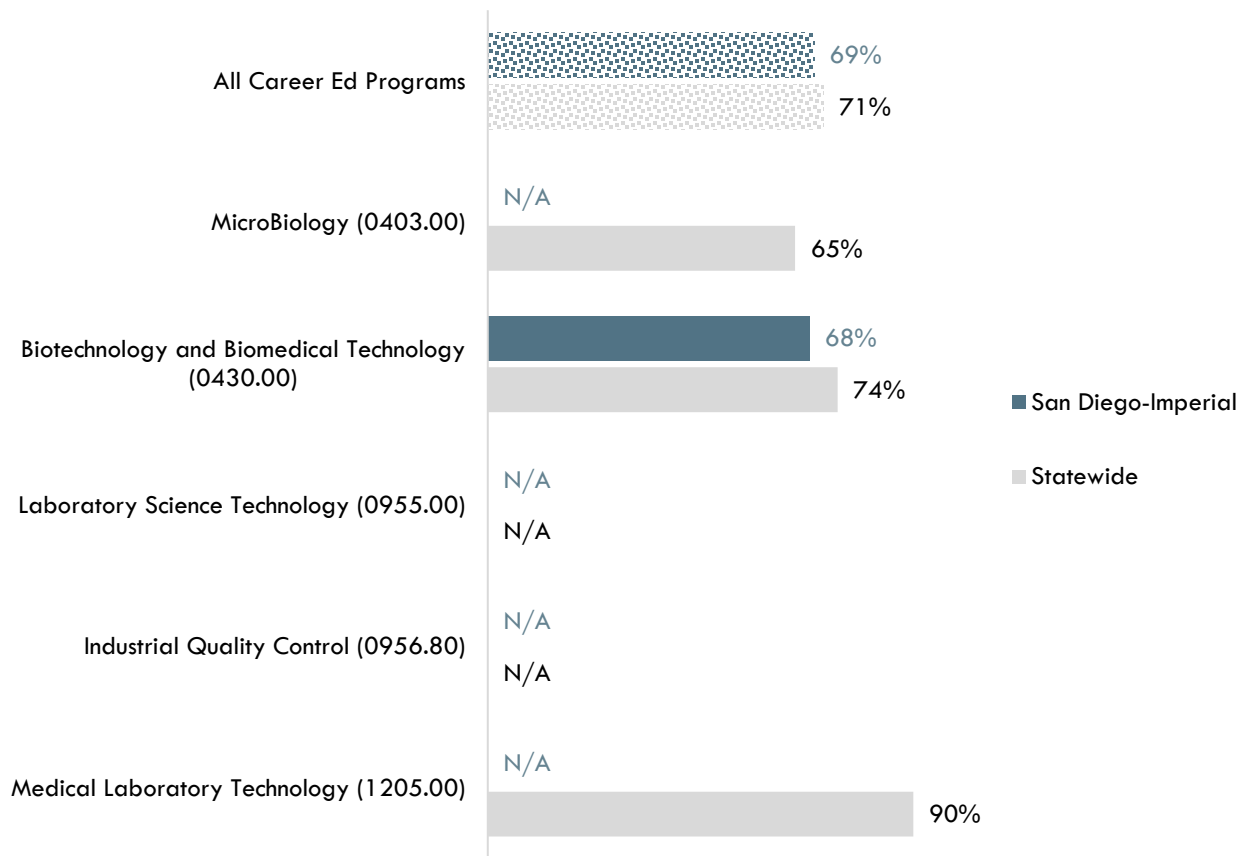


¹⁷ DataVista, California Community Colleges, datavista.cccco.edu/.

¹⁸ Most recent year with available data is Program Year 2020-21. Among completers and skills builders who exited, the percentage of students who attained a living wage.

According to the California Community Colleges DataVista, 68 percent of students in the San Diego-Imperial region obtained a job closely related to their field of study after completing a program related to *Biotechnology Occupations*, compared to 65 to 74 percent statewide and 71 percent of students in Career Education programs in general across the state (Exhibit 11).¹⁹

Exhibit 11: Percentage of Students in a Job Closely Related to Field of Study by Program, PY2020-21²⁰



"N/A" indicates insufficient data

¹⁹ DataVista, California Community Colleges, datavista.cccco.edu/.

²⁰ Most recent year with available data is Program Year 2019-20. Percentage of Students in a Job Closely Related to Field of Study: Among students who responded to the CTEOS, the percentage reporting employment in the same or similar field as their program of study.

Employers

Between January 1, 2021 and December 31, 2023, the top five employers in San Diego County for *Biotechnology Occupations* were University of California San Diego, Aerotek, Kelly Services, Labcorp, and Thermo Fisher Scientific based on online job postings (Exhibit 12).

Exhibit 12: Top Employers for *Biotechnology Occupations* in San Diego County²¹

Top Employers	
<ul style="list-style-type: none"> University of California San Diego Aerotek Kelly Services Labcorp Thermo Fisher Scientific 	<ul style="list-style-type: none"> Randstad Scripps Health Sharp Healthcare Rady Children's Hospital Healthcare Employment Network

Skills

Exhibit 13 lists the top specialized, soft, and software skills that appeared in online job postings between January 1, 2021 and December 31, 2023.

Exhibit 13: Top Skills for *Biotechnology Occupations* in San Diego County²²

Specialized Skills	Soft Skills	Software Skills
<ul style="list-style-type: none"> Biology Good Manufacturing Practices Auditing Chemistry Standard Operating Procedure Laboratory Equipment Medical Laboratory Quality Management Systems Laboratory Experience Data Entry Corrective & Preventive Action Microbiology Pharmaceuticals Biotechnology Biochemical Assays 	<ul style="list-style-type: none"> Communication Quality Control Detail Oriented Quality Assurance Management Operations Troubleshooting Problem Solving Safety Assurance Research Writing Organizational Skills Verbal Communication Skills Computer Literacy Investigation 	<ul style="list-style-type: none"> Microsoft Excel Microsoft Office

²¹ Lightcast 2024.03; "Job Posting Analytics." 2021-2023.

²² Lightcast 2024.03; "Job Posting Analytics." 2021-2023.

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Important Disclaimers

All representations included in this report have been produced from primary research and/or secondary review of publicly and/or privately available data and/or research reports. This study examines the most recent data available at the time of the analysis; however, data sets are updated regularly and may not be consistent with previous reports. Efforts have been made to qualify and validate the accuracy of the data and the report findings; however, neither the Centers of Excellence for Labor Market Research (COE), COE host district, nor California Community Colleges Chancellor's Office are responsible for the applications or decisions made by individuals and/or organizations based on this study or its recommendations.