



Biotechnology Research Lab Technician

November 2017

Prepared by the Los Angeles/Orange County Center of Excellence for Labor Market Research

Program Recommendation

This report was compiled by the Los Angeles/Orange County Center of Excellence to provide regional labor market data for the program recommendation of biotechnology research lab technicians. This report can help determine whether there is demand in the local labor market that is not being met by the supply from programs of study (CCC and non-CCC) that align with this occupation group.

Based on the data, the COE has determined there is an unmet need for the biotechnology research lab technician program in the Los Angeles County region. Reasons include:

- Occupations related to biotechnology are forecasted to increase by 7% over the next five years, resulting in over 900 annual jobs
- On average, only 23 awards (associate degrees and certificates) are completed each year for the biotechnology and biomedical technology program in Los Angeles County
- For three of the four biotechnology-related occupations, at least one third of the workforce has completed postsecondary courses, demonstrating relevance for community college students

Occupation Codes and Descriptions

Currently, there are four occupations in the standard occupational classification (SOC) system related to the study of biotechnology and biomedical technology, and two emerging occupations in the O*NET¹ database of occupational information. The occupation titles and descriptions, as well as reported job titles are included in Exhibit 1.

Exhibit 1 – Occupations, descriptions and sample job titles

SOC Code	Title	Description	Sample of Reported Job Titles
19-4021.00	Biological Technicians	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.	Biological Science Laboratory Technician, Biological Science Technician, Biological Technician, Laboratory Technician, Marine Fisheries Technician, Research Assistant, Research Associate, Research Specialist, Research Technician, Wildlife Biology Technician

¹ New and emerging occupations (N&E) are incorporated into the O*NET-SOC classification system based on the evolving nature of workforce requirements stemming from changes in technology, society, law, and business practices. Incorporating N&E occupations into the O*NET system makes O*NET information more beneficial and responsive. <https://www.onetcenter.org/reports/NewEmerging.html>

49-9062.00	Medical Equipment Repairers	Test, adjust, or repair biomedical or electro-medical equipment.	Bio Medical Technician, Biomedical Electronics Technician, Biomedical Engineering Technician (BMET), Biomedical Equipment Technician (BMET), Dental Equipment Technician, Electronic Technician, Repair Technician, Service Technician, X-ray Service Engineer
29-2012.00	Medical and Clinical Laboratory Technicians	Perform routine medical laboratory tests for the diagnosis, treatment, and prevention of disease. May work under the supervision of a medical technologist.	Certified Clinical Laboratory Technician, Clinical Laboratory Scientist, Clinical Laboratory Technician, Laboratory Assistant (Lab Assistant), Laboratory Supervisor, Laboratory Technician, Medical Laboratory Technician (MLT), Medical Technician
19-4011.00	Agricultural and Food Science Technicians	Work with agricultural and food scientists in food, fiber, and animal research, production, and processing; and assist with animal breeding and nutrition. Includes technicians who assist food scientists or technologists in the research and development of production technology, quality control, packaging, processing, and use of foods.	See reported job titles for Agricultural Technicians and Food Science Technicians
19-4011.01	Agricultural Technicians	Set up or maintain laboratory equipment and collect samples from crops or animals. Prepare specimens or record data to assist scientists in biology or related life science experiments.	Agricultural Research Technician, Agricultural Research Technologist, Agricultural Technician, Laboratory Technician (Lab Tech), Research Assistant, Research Associate, Research Specialist, Research Technician, Seed Analyst, Senior Agricultural Assistant
19-4011.02	Food Science Technicians	Perform standardized qualitative and quantitative tests to determine physical or chemical properties of food or beverage products.	Central Lab Technician (CLT), Food Science Technician, Laboratory Technician, Laboratory Assistant, Operations Technician, Quality Analyst, Quality Assurance Analyst (QA Analyst), Quality Control Technician (QC Technician), Quality Technician, Technical Services Analyst

Source: O*NET Online

Current and Future Employment

In Los Angeles County, the number of jobs related to biotechnology is expected to increase by 7% over the next five years. More than 900 job opportunities will be available annually for these occupations through 2021 due to new job growth and replacement need (e.g., retirements). Exhibit 2 contains detailed employment projections data for these occupations.

Exhibit 2 – Five-year projections for biotechnology-related occupations in Los Angeles County

SOC	Occupation	2016 Jobs	2021 Jobs	2016 - 2021 Change	2016 - 2021 % Change	Annual Openings
29-2012	Medical and Clinical Laboratory Technicians	5,872	6,397	525	9%	423
19-4021	Biological Technicians	2,694	2,798	104	4%	336
49-9062	Medical Equipment Repairers	973	1,033	60	6%	105
19-4011	Agricultural and Food Science Technicians	391	400	9	2%	42
		9,930	10,628	698	7%	906

Source: Economic Modeling Specialists International (EMSI)

Earnings

In Los Angeles County, the entry-level average wage for biotechnology-related occupations ranges from \$12.84 to \$16.78 per hour – two of the four occupations are below the MIT Living Wage² estimate of \$13.08 per hour for a single adult. The average annual earnings for this occupation group in the region range from \$41,558 to \$55,865 per year, assuming full-time employment.

Exhibit 3 contains hourly wages and annual average earnings for these occupations. Entry-level hourly earnings is represented by the 10th percentile of wages, median hourly earnings is represented by the 50th percentile of wages, and experienced hourly earnings is represented by the 90th percentile of wages, demonstrating various levels of employment.

² MIT Living Wage Calculator. <http://livingwage.mit.edu/>

Exhibit 3 – Earnings for biotechnology-related occupations in Los Angeles County, 2016-2021

SOC	Occupation	Entry-Level Hourly Earnings	Median Hourly Earnings	Experienced Hourly Earnings	Average Annual Earnings
49-9062	Medical Equipment Repairers	\$16.78	\$25.69	\$43.57	\$55,865
19-4021	Biological Technicians	\$14.35	\$24.10	\$38.83	\$53,560
19-4011	Agricultural and Food Science Technicians	\$13.05	\$18.92	\$25.62	\$41,558
29-2012	Medical and Clinical Laboratory Technicians	\$12.84	\$19.13	\$34.77	\$45,240

Source: Economic Modeling Specialists International (EMSI)

Employer Job Postings

In this research brief, real-time labor market information is used to provide a more nuanced view of the current job market, as it captures job advertisements for occupations relevant to the field of study. Employer job postings are consulted to understand who is employing biotechnology workers, and what they are looking for in potential candidates. To identify job postings related to biotechnology, the following standard occupational classifications were used: medical and clinical laboratory technicians (29-2012.00), medical equipment repairers (49-9062.00), biological technicians (19-4021.00), food science technicians (19-4011.02), and agricultural technicians (19-4011.01).

Top Occupations

In 2016, there were 1,935 employer postings for biotechnology-related jobs. The majority of the postings (84%) were for medical and clinical laboratory technicians (1,631 job postings). There were 1,850 job postings for the same cluster of occupations in 2015, and 1,151 job postings in 2014.

Exhibit 4 – Top occupations in job postings (n=1,935)

SOC Code	Occupation	Job Postings, Full Year 2016
29-2012.00	Medical and Clinical Laboratory Technicians	1,631
49-9062.00	Medical Equipment Repairers	176
19-4021.00	Biological Technicians	66
19-4011.02	Food Science Technicians	38
19-4011.01	Agricultural Technicians	24

Source: Labor Insight/Jobs (Burning Glass)

Top Titles

The top job titles for employers posting ads for biotechnology-related jobs are listed in Exhibit 5. Laboratory technician is mentioned as the job title in 29% of all relevant job postings (559 postings).

Exhibit 5 –Job titles (n=1,935)

Title	Job Postings, Full Year 2016
Laboratory Technician	559
Laboratory Assistant	418
Patient Care Technician	196
Equipment Technician	67
Medical Laboratory Technician	62
Medical Technician	49
Specimen Technician	41
Biomedical Technician	32
Specimen Accessioner	32
Clinical Technician	27

Source: Labor Insight/Jobs (Burning Glass)

Top Employers

Exhibit 6 lists the major employers hiring professionals in the biotechnology field. Top employers postings job ads included DaVita Incorporated, USC, Providence Health & Services, UCLA Health System, and Cedars-Sinai. The top worksite cities in the region for these occupations were Los Angeles, Valencia, Torrance, Santa Monica, and Pasadena.

Exhibit 6 – Top employers (n=1,935)

Employer	Job Postings, Full Year 2016
DaVita Incorporated	173
University of Southern California	89
Providence Health & Services	64
UCLA Health System	61
Cedars-Sinai	48

Source: Labor Insight/Jobs (Burning Glass)

Certifications and Skills

Phlebotomy is the most sought after certification for this occupation group, and it was included on 53% of the postings that specified a certification. Other certifications that were largely present on postings were first AID CPR AED, certified medical assistant, and EMT. Job-specific skills desired by employers include phlebotomy, chemistry, patient care, and Microsoft Excel.

Exhibit 7 –Job certifications (n=610) and job skills (n=1,662)

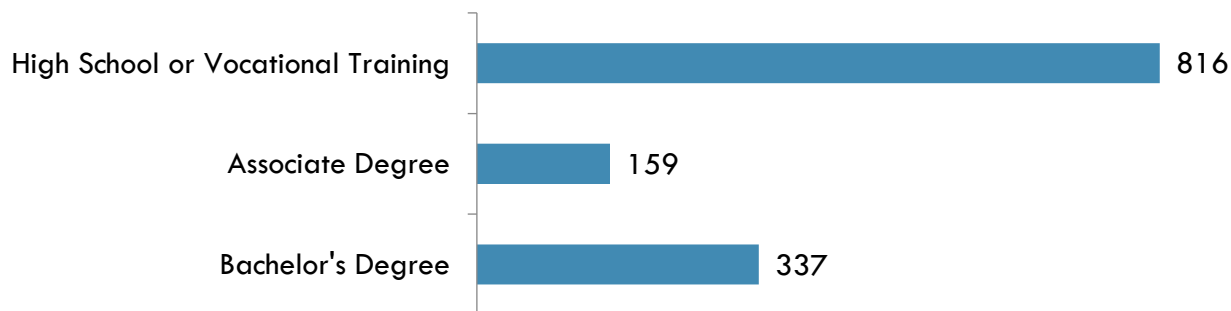
Certification	Job Postings, Full Year 2016	Skills	Job Postings, Full Year 2016
Phlebotomy Certification	322	Phlebotomy	378
First AID CPR AED	183	Chemistry	287
Certified Medical Assistant	148	Patient Care	278
Emergency Medical Technician (EMT)	113	Microsoft Excel	276

Source: Labor Insight/Jobs (Burning Glass)

Advertised Education Levels

Exhibit 8 displays the education level requested by employers in online job ads. The majority of employers were looking for a candidate with high school or vocational training. Approximately 32% of job postings did not specify a level of education.

Exhibit 8 – Minimum advertised education requirements for biotechnology-related jobs (n=1,312)



Source: Labor Insight/Jobs (Burning Glass)

Industry Concentration

Biotechnology-related jobs in Los Angeles County are most often found in the general medical and surgical hospitals industry (23% of total jobs in the industry). Exhibit 9 shows the industries that are the largest employers of biotechnology workers in region.

Exhibit 9 – Industries employing the most biotechnology workers, 2016

NAICS (6-Digit)	Industry	Occupation Group Jobs in Industry	% of Occupation Group in Industry
622110	General Medical and Surgical Hospitals	2,304	23%
541712	Research and Development in the Physical, Engineering, and Life Sciences (except Biotechnology)	902	9%
621511	Medical Laboratories	887	9%
621111	Offices of Physicians (except Mental Health Specialists)	598	6%
621491	HMO Medical Centers	579	6%

Education and Training

Exhibit 10 shows the typical entry-level education requirement for the occupations of interest, along with the typical on-the-job training, and percentage of workers in the field who hold a community college award or have completed some postsecondary courses. Biological technicians typically require a bachelor's degree, and 30% of the workforce in this occupation have completed some postsecondary coursework. For the other three occupations, an associate degree is typically required – over one third of the workforce has completed some postsecondary coursework, signaling relevance for community college students.

Exhibit 10 – Education and training requirements

SOC	Occupation	Typical entry-level education	Typical on-the-job training	% of Community College Award Holders or Some Postsecondary Coursework
19-4011	Agricultural and Food Science Technicians	Associate Degree	Moderate	36%
19-4021	Biological Technicians	Bachelor's Degree	None	30%
29-2012	Medical and Clinical Laboratory Technicians	Associate Degree	None	36%
49-9062	Medical Equipment Repairers	Associate Degree	Moderate	54%

Source: Economic Modeling Specialists International, Bureau of Labor Statistics Employment Projections (Educational Attainment)

Currently, there are four community colleges in Los Angeles County that train students in programs related to the field of biotechnology. Exhibit 11 displays the headcount and annual average community college awards for each of the colleges training in this field. Headcount is the actual number of students enrolled, regardless of credit hours. It is also important to note that an award is not equivalent to a single person in search of a job opening, since a student may earn more than one award (e.g. an associate degree and a certificate).

Between 2012-2015, the total annual average community college awards conferred was 23 (1 associate degree and 22 certificates) across one program: Biotechnology and Biomedical Technology (TOP Code: 0430.00)

Exhibit 11 – CCC Student Awards (by TOP and College)

TOP Code	Program	College	2012 – 2015 Annual Average			
			CCC Headcount	CCC Associate Degrees	CCC Certificates	Total Average CC Awards
0430.00	Biotechnology and Biomedical Technology	LA Trade	15	N/A	N/A	N/A
		LA Valley	19	N/A	N/A	N/A
		Mt San Antonio	64	N/A	N/A	N/A
		Pasadena	43	1	22	23
			141	1	22	23

Source: California Community Colleges Chancellor’s Office MIS Data Mart

Student Outcomes

The CTE LaunchBoard provides student outcome data on the effectiveness of CTE programs. The following student outcome information was collected from exiters of the biotechnology and biomedical technology program (TOP Code: 0430.00) in Los Angeles County for the 2014-15 academic year.

- The median annual wage after program completion is \$33,952
- 45% of students are earning a living wage
- 73% of students are employed within six months after completing a program

Source: CTE LaunchBoard

Sources

O*Net Online, Labor Insight/Jobs (Burning Glass), Economic Modeling Specialists International (EMSI), MIT Living Wage Calculator, Bureau of Labor Statistics (BLS) Education Attainment, California Community Colleges Chancellor’s Office Management Information Systems (MIS) Data Mart, CTE LaunchBoard, Statewide CTE Outcomes Survey, Employment Development Department Unemployment Insurance Dataset

Notes

Data included in this analysis represents the labor market demand for positions most closely related to biotechnology research lab technicians. Standard occupational classification (SOC) codes were chosen based on the national education level required for employment (associate degree and postsecondary certificate) as well as the proportion of current workers who hold a community college award or have had some community college training. This selection process narrows the labor market analysis to the most relevant employment opportunities for students with community college education and/or training.

Traditional labor market information was used to show current and projected employment based on data trends, as well as annual average awards granted by regional community colleges. Real-time labor market information captures job post advertisements for occupations relevant to the field of study and should not be used to establish current job openings, because the numbers may include duplicate job postings or postings intended to gather a pool of applicants. Real-time labor market information can signal demand and show what employers are looking for in potential employees, but is not a perfect measure of the quantity of open positions.