

Program Endorsement Brief: 0430.00/Biotechnology and Biomedical Technology Biotechnology/Biological Technician

Orange County Center of Excellence, April 2022

Summary Analysis

Program Endorsement:	Endorsed: All Criteria Met <input type="checkbox"/>	Endorsed: Some Criteria Met <input checked="" type="checkbox"/>	Not Endorsed <input type="checkbox"/>
Program Endorsement Criteria			
Supply Gap:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Living Wage: (Entry-Level, 25 th)	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Education:	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Emerging Occupation(s)			
Yes <input type="checkbox"/>		No <input checked="" type="checkbox"/>	

The Orange County Center of Excellence for Labor Market Research (COE) prepared this report to provide Los Angeles/Orange County regional labor market supply and demand data related to six middle-skill occupations: *biological technicians* (19-4021), *chemical technicians* (19-4031), *life, physical, and social science technicians, all other* (19-4099), *clinical laboratory technologists and technicians* (29-2018), *medical equipment repairers* (49-9062), and *inspectors, testers, sorters, samplers and weighers* (51-9061). Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.¹ Although *biological technicians* and *clinical laboratory technologists and technicians* typically require a bachelor's degree, they are considered middle-skill because approximately one-third of workers in the field have completed some college or an associate degree. This report is intended to help determine whether there is demand in the local labor market that is not being met by the supply from community college programs that align with the relevant occupations.

Based on the available data there appears to be a supply gap for these biotechnology occupations in the region. Furthermore, while the majority (52%) of annual openings for the occupations in this report typically require a high school diploma or equivalent, more than one-third of workers in the field have completed some college or an associate degree as their highest level of education. However, the majority of annual job openings have entry-level wages that are lower than the living wage in both Los Angeles and Orange counties. **Therefore, due to some of the criteria being met, the COE endorses this proposed program.** Detailed reasons include:

Demand:

- **Supply Gap Criteria** – Over the next five years, there is projected to be **4,976 jobs available annually** in the region due to retirements and workers leaving the field,

¹ The COE classifies middle-skill jobs as the following:

- All occupations that require an educational requirement of some college, associate degree or apprenticeship;
- All occupations that require a bachelor's degree, but also have more than one-third of their existing labor force with an educational attainment of some college or associate degree; or
- All occupations that require a high school diploma or equivalent or no formal education, but also require short- to long-term on-the-job training where multiple community colleges have existing programs.

which is more than the 256 awards conferred annually by educational institutions in the region.

- However, the life, physical, and social science technicians, all other (19-4099) SOC code includes a variety of technician job titles and does not solely represent life science technicians. Therefore, the ***number of annual job openings directly related to biotechnology is overstated for this occupation.***
- **Living Wage Criteria** –Within Orange County, the majority (73%) of annual job openings for these biotechnology occupations ***have entry-level wages below the county's living wage (\$20.63/hour).***²
- **Educational Criteria** –Within the LA/OC region, ***52% of the annual job openings*** for occupations related to biotechnology ***typically require a high school diploma or equivalent.***
 - However, the national-level educational attainment data indicates ***between 34.1% and 41.3% of workers in the field have completed some college or an associate degree*** as their highest level of education.

Supply:

- There are **12 community colleges** in the LA/OC region that issue awards related to biotechnology, conferring an average of **181 awards annually** between 2017 and 2020.
- Between 2016 and 2019, there was an average of **75 awards conferred annually** in related training programs by non-community college institutions, all of which were generated by **two individual non-community college institutions throughout** the region.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for these six biotechnology occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to decrease by 3% through 2025. However, there will be nearly 5,000 job openings per year through 2025 due to retirements and workers leaving the field.

It is important to note that the *life, physical, and social science technicians, all other* (19-4099) SOC codes includes a variety of job titles that are not directly related to biotechnology such as meteorological technician, paleontological helper, city planning aide. Since this SOC code does not solely represent life science technicians, number of annual job openings directly related to biotechnology is overstated for this occupation.

² Living wage data was pulled from California Family Needs Calculator on 4/18/2022. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/family-needs-calculator/>.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties³

Geography	2020 Jobs	2025 Jobs	2020-2025 Change	2020-2025 % Change	Annual Openings
Los Angeles	31,338	30,117	(1,221)	(4%)	3,344
Orange	14,031	14,070	39	0.28%	1,632
Total	45,369	44,187	(1,182)	(3%)	4,976

Wages

The labor market endorsement in this report considers the entry-level hourly wages for these biotechnology occupations in Orange County as they relate to the county's living wage. Los Angeles County wages are included below in order to provide a complete analysis of the LA/OC region. Detailed wage information, by county, is included in Appendix A.

Orange County: The majority (73%) of annual openings for these biotechnology occupations have entry-level wages below the living wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages are in a range between \$15.49 and \$23.13. Experienced workers can expect to earn wages between \$27.19 and \$43.69, which are higher than the living wage estimate. Orange County's average wages are below the average statewide wage of \$26.62 for these occupations.

Los Angeles County: The majority (65%) of annual openings for these biotechnology occupations have entry-level wages below the living wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between \$15.24 and \$20.87. Experienced workers can expect to earn wages between \$26.83 and \$41.60, which are higher than the living wage estimate. Los Angeles County's average wages are below the average statewide wage of \$26.62 for these occupations.

Job Postings

There were 19,147 online job postings related to biotechnology listed in the past 12 months. The highest number of job postings were for laboratory technicians, quality inspectors, quality control inspectors, laboratory assistants, and quality assurance technicians. The top skills were quality assurance and control, quality management, chemistry, data entry, and good manufacturing practices (GMP). The top three employers, by number of job postings, in the region were University of California, Actalent, and Anthem Blue Cross.

Educational Attainment

The Bureau of Labor Statistics (BLS) lists the following awards as the typical entry-level education for these Laboratory Science Technology occupations:

- High school diploma or equivalent: *inspectors, testers, sorters, samplers, and weighers*
- Associate degree: *chemical technicians; life, physical, and social science technicians, all other; and medical equipment repairers*

³ Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

- Bachelor's degree: *clinical laboratory technologists and technicians; and biological technicians*

In the LA/OC region, the majority of annual job openings (53%) typically require a high school diploma or equivalent. However, the national-level educational attainment data indicates between 34.1% and 40.3% of workers in the field have completed some college or an associate degree as their highest level of education. Of the 70% of Laboratory Science Technology job postings listing a minimum education requirement in Los Angeles/Orange County, 56.7% (7,571) requested a high school diploma or equivalent, 8.6% (1,154) requested an associate degree, and 34.7% (4,638) requested a bachelor's degree or higher.

Educational Supply

Community College Supply—Exhibit 2 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Biotechnology and Biomedical Technology (0430.00), Biomedical Instrumentation (0934.60), Chemical Technology (0954.00), Laboratory Science Technology (0955.00), and Medical Laboratory Technology (1205.00). The colleges with the most completions in the region are: Irvine, LA Mission, and Saddleback. Over the past 12 months, there were four other related program recommendation requests from regional community colleges.

Exhibit 2: Regional community college awards (certificates and degrees), 2017-2020

TOP Code	Program	College	2017- 2018 Awards	2018- 2019 Awards	2019- 2020 Awards	3-Year Award Average
0430.00	Biotechnology and Biomedical Technology	Citrus	16	19	8	14
		East LA	-	-	5	2
		LA Mission	14	21	37	24
		LA Trade	5	2	7	5
		Pasadena	19	18	24	20
		LA Subtotal	54	60	81	65
		Fullerton	3	18	18	13
		Irvine	13	25	33	24
		Santa Ana	13	11	10	11
		Santiago Canyon	-	11	8	6
		OC Subtotal	29	65	69	54
Supply Subtotal/Average			83	125	150	119
0934.60	Biomedical Instrumentation	LA Valley	13	17	7	12
		LA Subtotal	13	17	7	12
Supply Subtotal/Average			13	17	7	12
0954.00	Chemical Technology	East LA	-	-	2	1
		LA Trade	-	8	2	3
		LA Subtotal	0	8	4	4

TOP Code	Program	College	2017-2018 Awards	2018-2019 Awards	2019-2020 Awards	3-Year Award Average
Supply Subtotal/Average			0	8	4	4
0955.00	Laboratory Science Technology	LA Trade	14	-	-	5
		Mt San Antonio	2	2	1	2
		LA Subtotal	16	2	1	6
Supply Subtotal/Average			16	2	1	6
1205.00	Medical Laboratory Technology	Mt San Antonio	17	19	11	16
		LA Subtotal	17	19	11	16
		Saddleback	24	18	29	24
		OC Subtotal	24	18	29	24
Supply Subtotal/Average			41	37	40	39
Supply Total/Average			153	189	202	181

Non-Community College Supply—For a comprehensive regional supply analysis, it is also important to consider the supply from other institutions in the region that provide training programs for biotechnology. Exhibit 3 shows the annual and three-year average number of awards conferred by these institutions in the related Classification of Instructional Programs (CIP) Codes: Biomedical Technology/Technician (15.0401). Due to different data collection periods, the most recent three-year period of available data is from 2016 to 2019. Between 2016 and 2019, four-year colleges in the region conferred an average of 75 awards annually in related training programs.

Exhibit 3: Regional non-community college awards, 2016-2019

			2016-2017	2017-2018	2018-2019	3-Year
CIP Code	Program	College	Awards	Awards	Awards	Award Average
15.0401	Biomedical Technology/Technician	DeVry University-California	19	9	5	11
		Southern California Institute of Technology	68	62	63	64
Supply Total/Average			87	71	68	75

Appendix A: Occupational demand and wage data by county

Exhibit 4. Orange County

Occupation (SOC)	2020 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Biological Technicians (19-4021)	605	655	50	8%	89	\$18.02	\$22.83	\$28.94
Chemical Technicians (19-4031)	691	701	9	1%	77	\$16.96	\$21.87	\$31.12
Life, Physical, and Social Science Technicians, All Other (19-4099)	1,078	1,177	100	9%	156	\$19.12	\$25.86	\$33.66
Clinical Laboratory Technologists and Technicians (29-2018)	3,174	3,778	605	19%	351	\$21.79	\$29.51	\$43.69
Medical Equipment Repairers (49-9062)	824	841	16	2%	91	\$23.13	\$31.35	\$41.42
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	7,659	6,918	(740)	(10%)	868	\$15.49	\$19.70	\$27.19
Total	14,031	14,070	39	0%	1,632			

Exhibit 5. Los Angeles County

Occupation (SOC)	2020 Jobs	2025 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75th Percentile)
Biological Technicians (19-4021)	1,774	1,875	101	6%	247	\$17.78	\$22.52	\$28.55
Chemical Technicians (19-4031)	1,512	1,529	18	1%	169	\$17.03	\$21.97	\$31.26
Life, Physical, and Social Science Technicians, All Other (19-4099)	2,720	2,808	88	3%	353	\$20.09	\$27.19	\$35.42

Occupation (SOC)	2020 Jobs	2025 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 th Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 th Percentile)
Clinical Laboratory Technologists and Technicians (29-2018)	8,238	8,756	518	6%	665	\$20.74	\$28.09	\$41.60
Medical Equipment Repairers (49-9062)	1,549	1,536	(13)	(1%)	160	\$20.87	\$28.36	\$37.55
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	15,546	13,614	(1,932)	(12%)	1,750	\$15.24	\$19.42	\$26.83
Total	31,338	30,117	(1,221)	(4%)	3,344			

Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2020 Jobs	2025 Jobs	5-Yr Change	5-Yr % Change	Annual Openings
Biological Technicians (19-4021)	2,379	2,529	150	6%	336
Chemical Technicians (19-4031)	2,203	2,230	27	1%	246
Life, Physical, and Social Science Technicians, All Other (19-4099)	3,797	3,985	188	5%	509
Clinical Laboratory Technologists and Technicians (29-2018)	11,411	12,534	1,123	10%	1,016
Medical Equipment Repairers (49-9062)	2,373	2,376	3	0%	251
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	23,205	20,532	(2,673)	(12%)	2,618
Total	45,369	44,187	(1,182)	(3%)	4,976

Appendix B: Sources

- O*NET Online

- Labor Insight/Jobs (Burning Glass)
- Economic Modeling Specialists, International (Emsi)
- Bureau of Labor Statistics (BLS)
- Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- California Family Needs Calculator, Insight Center for Community Economic Development
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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