

Program Endorsement Brief: 0430.00/Biotechnology and Biomedical Technology

Biotechnology (Associate of Arts)

Biotechnology: Basic Wet Lab Skills (Certificate)

Biotechnology: Biomanufacturing (Certificate)

Los Angeles/Orange County Center of Excellence, January 2022

Summary

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 checked="" type="checkbox"/>	No <input type="checkbox"/>	

The Los Angeles/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 five middle-skill occupations: *biological technicians* (19-4021), *chemical technicians* (19-4031), *quality control analysts* (19-4099.01), *medical and clinical laboratory technicians* (29-2012), 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 two occupations in this report 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. While entry-level wages are lower than the self-sufficiency standard wage in both Los Angeles and Orange counties, more than one-third of current workers in the field have completed some college or an associate degree as their highest level of education. **Therefore, due to some of the criteria being met, the COE endorses this proposed program.** Detailed reasons include:

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.

Demand:

- **Supply Gap Criteria** – Over the next five years, there is projected to be **4,073 jobs available annually** in the region due to retirements and workers leaving the field, **which is more than the 295 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 emerging occupations, including *quality control analysts* (19-4099.01). Since the SOC code does not solely represent *quality control analysts*, **the number of annual job openings is likely overstated.**
 - Over the past 12 months, there were **15,718 online job postings related to the biotechnology occupations** in this report. The highest number of job postings were for laboratory technicians, laboratory assistants, quality/quality control inspectors, quality assurance technicians, and quality assurance specialists.
- **Living Wage Criteria** – Within Los Angeles County, the majority (69%) of annual job openings for these biotechnology occupations have entry-level wages **below** the self-sufficiency standard hourly wage (\$18.10/hour).²
- **Educational Criteria** – Within the LA/OC region, **58% of the annual job openings** for these occupations related to biotechnology **typically require a high school diploma.**
 - However, the national-level educational attainment data indicates **between 34% and 40% of workers in the field have completed some college or an associate degree.**

Supply:

- There are **16 community colleges** in the LA/OC region that issue awards related to biotechnology, conferring an average of **214 awards annually** between 2017 and 2020.
- Between 2016 and 2019, there was an average of **81 awards conferred annually** in related training programs by non-community college institutions throughout the region.

Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for these biotechnology occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to decrease by 4% through 2025. However, there will be more than 4,000 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 code includes various emerging occupations and not solely *quality control analysts* (19-4099.01). Therefore, the data in Exhibit 1 is likely overstated for *quality control analysts*.

This report includes employment projection data by Emsi which uses EDD information. Emsi's projections are modeled on recorded (historical) employment figures and incorporate several underlying assumptions, including the assumption that the economy, during the projection period, will be at approximately full employment. To the extent that a recession or labor shock, such as the

Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California on 1/19/2022. For more information, visit: <http://selfsufficiencystandard.org/california>.

economic effects of COVID-19, can cause long-term structural change, it may impact the projections. At this time, it is not possible to quantify the full impact of COVID-19 on projections of industry and occupational employment. Therefore, the projections included in this report do not take the full impacts of COVID-19 into account.

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	29,752	28,082	(1,670)	(6%)	2,756
Orange	13,182	12,966	(217)	(2%)	1,317
Total	42,934	41,048	(1,887)	(4%)	4,073

Wages

The labor market endorsement in this report considers the entry-level hourly wages for these biotechnology occupations in Los Angeles County as they relate to the county’s self-sufficiency standard wage. Orange 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.

Los Angeles County— The majority (69%) of annual openings for the biotechnology occupations in this report have entry-level wages **below** the self-sufficiency standard wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between \$15.26 and \$20.64. Two occupations have entry-level wages that exceed the self-sufficiency standard wage: *clinical laboratory technologists and technicians* (\$20.64) and *life, physical, and social science technicians, all other* (\$19.88). Experienced workers can expect to earn wages between \$26.80 and \$41.37, which are higher than the self-sufficiency standard.

Orange County—The majority (81%) of annual openings for the biotechnology occupations in this report have entry-level wages **below** the self-sufficiency standard wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages are in a range between \$15.50 and \$21.82. The only occupation in this report with entry-level wages that exceed the self-sufficiency standard is *clinical laboratory technologists and technicians* (\$21.82) Experienced workers can expect to earn wages between \$27.16 and \$43.75, which are higher than the self-sufficiency standard.

Job Postings

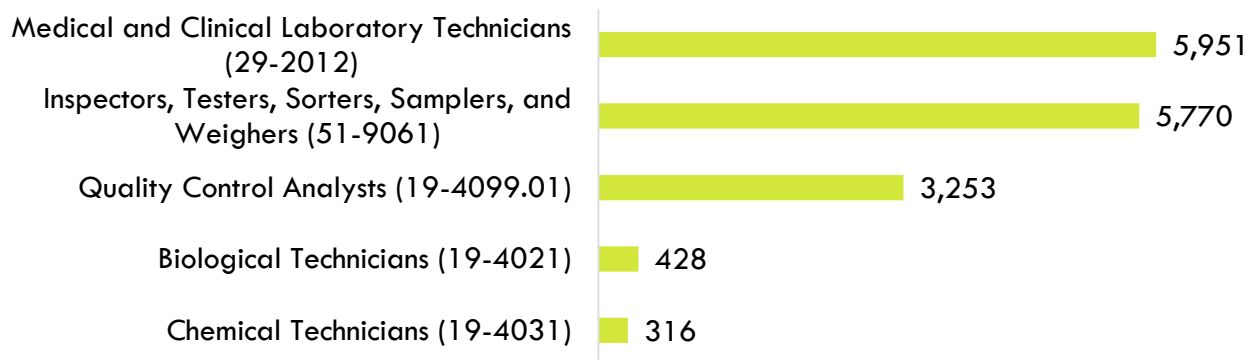
There were 15,718 online job postings related to biotechnology listed in the past 12 months. Exhibit 2 displays the number of job postings by occupation. The majority of job postings were for *medical and clinical laboratory technicians* (38%) and *inspectors, testers, sorters, samplers, and weighers* (37%), followed by *quality control analysts* (21%). The highest number of job postings were for laboratory technicians, laboratory assistants, quality/quality control inspectors, quality assurance technicians, and quality assurance specialists. The top skills were quality assurance and control, quality management, data entry, chemistry, and good manufacturing practices (GMP).

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.

The top three employers, by number of job postings, in the region were: University of California, Anthem Blue Cross, and Actalent.

It is important to note that the job postings data included in this section reflects online job postings listed in the past 12 months and does not yet demonstrate the full impact of COVID-19. While employers have generally posted fewer online job postings since the beginning of the pandemic, the long-term effects are currently unknown.

Exhibit 2: Job postings by occupation (last 12 months)



Educational Attainment

The Bureau of Labor Statistics (BLS) lists the following entry-level education levels for the occupations in this report:

- **Bachelor's degree:** *Biological technicians (19-4021); Clinical laboratory technologists and technicians (29-2018)*
- **Associate degree:** *Chemical technicians (19-4031); Life, physical, and social science technicians, all other (19-4099)*
- **High School diploma:** *Inspectors, testers, sorters, samplers, and weighers (51-9061)*

In the LA/OC region, the majority of annual job openings (58%) typically require a high school diploma. However, the national-level educational attainment data indicates between 34% and 40% of workers in the field have completed some college or an associate degree. Of the 69% of biotechnology job postings listing a minimum education requirement in Los Angeles/Orange County, 60% (6,530) requested high school or vocational training, 8% (882) requested an associate degree, and 32% (3,508) requested a bachelor's degree.

Educational Supply

Community College Supply—Exhibit 3 shows the three-year average number of awards conferred by community colleges in programs that have historically trained for the occupations of interest. The colleges with the most completions in the region are: Santiago Canyon, Fullerton, and Irvine.

Exhibit 3: Regional community college awards (certificates and degrees), 2017-2020

TOP Code	Program	College	2017-18 Awards	2018-19 Awards	2019-20 Awards	3-Year Average
0430.00	Biotechnology and Biomedical Technology	Citrus	16	19	8	14
		East LA	-	-	5	2
		LA Mission	14	21	37	24
		LA Trade-Tech	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
0954.00	Chemical Technology	East LA	-	-	2	1
		LA Trade-Tech	-	8	2	3
		LA Subtotal	-	8	4	4
Supply Subtotal/Average			-	8	4	4
0955.00	Laboratory Science Technology	LA Trade-Tech	14	-	-	5
		Mt San Antonio	2	2	1	2
		LA Subtotal	16	2	1	6
Supply Subtotal/Average			16	2	1	6
0956.00	Manufacturing and Industrial Technology	Cerritos	6	2	-	3
		Compton	2	-	-	1
		El Camino	3	2	-	2
		Glendale	-	-	2	1
		LA Trade-Tech	-	5	9	5
		LA Valley	2	3	9	5
		Mt San Antonio	9	13	14	12
		LA Subtotal	22	25	34	27
		Fullerton	11	9	38	19
		Irvine	1	3	-	1
		Saddleback	9	11	7	9
		Santa Ana	1	-	3	1
		Santiago Canyon	27	41	10	26
		OC Subtotal	49	64	58	57

TOP Code	Program	College	2017-18 Awards	2018-19 Awards	2019-20 Awards	3-Year Average
Supply Subtotal/Average			71	89	92	84
0956.80	Industrial Quality Control	Santiago Canyon	-	2	-	1
		OC Subtotal	-	2	-	1
Supply Subtotal/Average			-	2	-	1
Supply Total/Average			92	95	120	102

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 the biotechnology occupations in this report. Exhibit 4 shows the annual and three-year average number of awards conferred by these institutions in programs crosswalked to the community college programs listed in Exhibit 3. 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 81 awards annually in related training programs.

Exhibit 4: Regional non-community college awards, 2016-2019

CIP Code	Program	Institution	2016-17 Awards	2017-18 Awards	2018-19 Awards	3-Year Average
15.0401	Biomedical Technology/ Technician	DeVry University-CA	19	9	5	11
		Southern California Institute of Technology	68	62	63	64
15.0613	Manufacturing Engineering Technology/ Technician	CSU-Long Beach	2	-	-	1
15.0702	Quality Control Technology/ Technician	CSU-Dominguez Hills	5	5	3	4
		CSU-Northridge	-	-	1	0
Supply Total/Average			94	76	72	81

Appendix A: Occupational demand and wage data by county

Exhibit 5. Los Angeles County

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)
Biological Technicians (19-4021)	1,785	1,820	35	2%	187	\$17.51	\$22.20	\$28.17
Chemical Technicians (19-4031)	1,513	1,490	(23)	(2%)	133	\$17.01	\$21.94	\$31.22
Life, Physical, and Social Science Technicians, All Other (19-4099)	2,726	2,735	9	0%	305	\$19.88	\$26.89	\$35.04
Clinical Laboratory Technologists and Technicians (29-2018)	8,218	8,618	399	5%	555	\$20.64	\$27.94	\$41.37
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	15,510	13,420	(2,091)	(13%)	1,576	\$15.26	\$19.42	\$26.80
Total	29,752	28,082	(1,670)	(6%)	2,756	-	-	-

Exhibit 6. Orange 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)	607	625	18	3%	65	\$18.16	\$23.02	\$29.21
Chemical Technicians (19-4031)	692	712	20	3%	66	\$16.98	\$21.91	\$31.17
Life, Physical, and Social Science Technicians, All Other (19-4099)	1,077	1,141	64	6%	134	\$19.18	\$25.93	\$33.77
Clinical Laboratory Technologists and Technicians (29-2018)	3,161	3,499	337	11%	256	\$21.82	\$29.53	\$43.75
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	7,645	6,989	(656)	(9%)	796	\$15.50	\$19.70	\$27.16
Total	13,182	12,966	(217)	(2%)	1,317	-	-	-

Exhibit 7. Los Angeles and Orange Counties

Occupation (SOC)	2020 Jobs	2025 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Typical Entry-Level Education
Biological Technicians (19-4021)	2,392	2,445	54	2%	253	Bachelor's degree
Chemical Technicians (19-4031)	2,205	2,202	(3)	(0%)	198	Associate degree
Life, Physical, and Social Science Technicians, All Other (19-4099)	3,803	3,876	73	2%	440	Associate degree
Clinical Laboratory Technologists and Technicians (29-2018)	11,380	12,116	737	6%	811	Bachelor's degree
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	23,155	20,409	(2,746)	(12%)	2,371	HS diploma or equivalent
Total	42,934	41,048	(1,887)	(4%)	4,073	-

Appendix B: Sources

- O*NET Online
- Labor Insight/Jobs (Burning Glass)
- Economic Modeling Specialists, International (Emsi)
- Bureau of Labor Statistics (BLS)
- California Employment Development Department, Labor Market Information Division, OES
- California Community Colleges Chancellor's Office Management Information Systems (MIS)
- Self-Sufficiency Standard at the Center for Women's Welfare, University of Washington
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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