

**Program Endorsement Brief: 0430.00/Biotechnology and Biomedical Technology
Biotechnology A.S.; Biotechnology Lab Assistant**
Orange County Center of Excellence, October 2020

Summary Analysis

Program Endorsement:	Endorsed: All Criteria Met <input checked="" type="checkbox"/>	Endorsed: Some Criteria Met <input 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, 25th)	Yes <input checked="" type="checkbox"/>	No <input 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 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: *Agricultural and Food Science Technicians (19-4011)*, *Biological Technicians (19-4021)*, *Chemical Technicians (19-4031)*, *Forensic Science Technicians (19-4092)*, *Life, Physical, and Social Science Technicians, All Other (19-4099)*, and *Medical Equipment Repairers (49-9062)*. Middle-skill occupations typically require some postsecondary education, but less than a bachelor’s degree.¹ Although two of the occupations in this report typically require a bachelor’s degree (*Biological Technicians* and *Forensic Science Technicians*), 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 middle-skill biotechnology occupations in the region. Furthermore, the majority of annual openings for the occupations in this report typically require an associate degree, and have entry-level wages that exceed the living wage in Orange County. **Therefore, due to all 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 **1,034 jobs available annually** in the region due to new job growth and replacements, **which is**

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.

more than the 183 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. Since the SOC code does not solely represent biotechnology occupations, **the number of annual job openings is likely overstated.**
- Over the past 12 months, there were **4,151 online job postings related to these middle-skill biotechnology occupations.** The highest number of job postings were for quality assurance technicians, quality control technicians, test engineers, quality assurance specialists, and research associates.
- **Living Wage Criteria** – Within Orange County, **the majority (79%) of annual job openings** for these six occupations **have entry-level wages above the county’s living wage (\$17.36/hour).**²
- **Educational Criteria** – Within the LA/OC region, **72% of the annual job openings** for middle-skill occupations related to biotechnology **typically require an associate degree.**
 - Furthermore, the national-level educational attainment data indicates **between 35.2% and 47.5% of workers in the field have completed some college or an associate degree.**

Supply:

- There are **9 community colleges** in the LA/OC region that issue awards related to biotechnology and/or laboratory science, conferring an average of **104 awards annually** between 2016 and 2019.
- Between 2014 and 2017, there was an average of **79 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 middle-skill biotechnology occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to increase by 3% through 2024. There will be more than 1,300 job openings per year through 2024 due to job growth and replacements. However, it is important to note that the *Life, Physical, and Social Science Technicians All Other (19-4099)* SOC code includes a variety of emerging occupations and not solely biotechnology occupations. Therefore, the data in Exhibit 1 is likely overstated for middle-skill biotechnology occupations.

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 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 impact of COVID-19 on projections of industry and

² Living wage data was pulled from California Family Needs Calculator on 10/12/2020. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

occupational employment. Therefore, the projections included in this report do not take the impacts of COVID-19 into account.

Exhibit 1: Occupational demand in Los Angeles and Orange Counties³

Geography	2019 Jobs	2024 Jobs	2019-2024 Change	2019-2024 % Change	Annual Openings
Los Angeles	7,775	7,985	210	3%	917
Orange	3,191	3,337	146	5%	387
Total	10,966	11,322	356	3%	1,304

Wages

The labor market endorsement in this report considers the entry-level hourly wages for these middle-skill 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 (79%) of annual openings for these middle-skill biotechnology occupations have entry-level wages above the living wage for one adult (\$17.36 in Los Angeles County).⁴ Typical entry-level hourly wages are in a range between \$14.74 and \$33.72. Of these six occupations, the only two occupations with typical entry-level hourly wages below Orange County’s living wage are *Agricultural and Food Science Technicians* (19-4011) and *Biological Technicians* (19-4021), earning \$14.74 and \$17.25, respectively. Experienced workers can expect to earn wages between \$24.77 and \$55.84, which are higher than the living wage estimate. Orange County’s average wages are above the average statewide wage of \$27.59 for these occupations.

Los Angeles County—All of the annual openings for these middle-skill biotechnology occupations have entry-level wages above the living wage for one adult (\$15.04 in Los Angeles County).⁵ Typical entry-level hourly wages are in a range between \$15.15 and \$35.69. Experienced workers can expect to earn wages between \$25.38 and \$59.22, which are higher than the living wage estimate. Los Angeles County’s average wages are above the average statewide wage of \$27.59 for these occupations.

Job Postings

There were 4,151 online job postings related to these middle-skill biotechnology occupations listed in the past 12 months. Exhibit 2 displays the job postings by occupation. The majority of job postings (66%) were for *Quality Control Analysts* (19-4099.01), an emerging occupation, followed by *Medical Equipment Repairers* (49-9062), and *Biological Technicians* (19-4021). The job titles used most often in postings were: quality assurance technicians, quality control technicians, test engineers, quality assurance specialists, and research associates. The top skills

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.

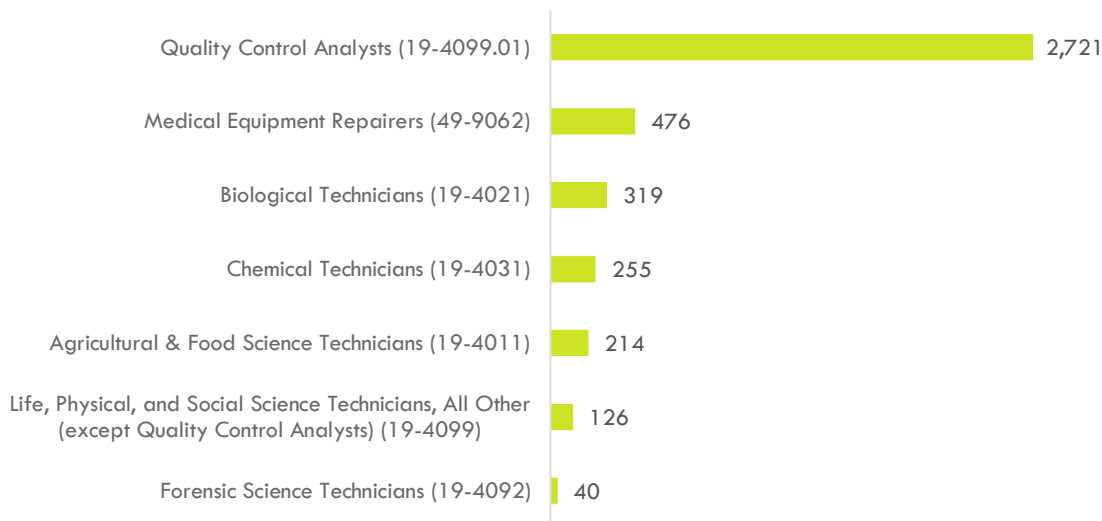
⁴ Living wage data was pulled from California Family Needs Calculator on 10/12/2020. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

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were: quality assurance and control, quality management, good manufacturing practices (GMP), chemistry, and repair. The top three employers, by number of job postings, in the region were Prime Healthcare Services, Anthem Blue Cross, and UCLA.

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 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 as typical entry-level education for these middle-skill biotechnology occupations:

- Bachelor’s degree: *Biological Technicians (19-4021); Forensic Science Technicians (19-4092)*
- Associate degree: *Agriculture and Food Science Technicians (19-4011); Chemical Technicians (19-4031); Life, Physical, and Social Science Technicians, All Other (19-4099); Medical Equipment Repairers (49-9062)*

In the LA/OC region, the majority of annual job openings (72%) typically require an associate degree. Furthermore, the national-level educational attainment data indicates between 35.2% and 47.5% of workers in the field have completed some college or an associate degree. Of the 72% of middle-skill biotechnology job postings listing a minimum education requirement in Los Angeles/Orange County, 55% (1,648) requested a bachelor’s degree, 35% (1,043) requested a high school diploma and 10% (312) requested an associate degree.

Educational Supply

Community College Supply—Exhibit 3 shows the three-year average number of awards conferred by community colleges in the related TOP codes: Biotechnology and Biomedical Technology (0430.00) and Laboratory Science Technology (0955.00). The colleges with the most completions in the region are: Citrus, Pasadena, Irvine, and LA Trade-Tech. Over the past 12

months, there were seven other related program recommendation requests from regional community colleges.

Exhibit 3: Regional community college awards (certificates and degrees), 2016-2019

TOP Code	Program	College	2016-2017 Awards	2017-2018 Awards	2018-2019 Awards	3-Year Award Average
0430.00	Biotechnology and Biomedical Technology	Citrus	18	16	19	18
		LA Mission	-	14	21	12
		LA Trade-Tech	3	5	2	3
		Pasadena	16	19	18	18
		LA Subtotal	37	54	60	50
		Fullerton	4	3	18	8
		Irvine	8	13	25	15
		Santa Ana	13	13	11	12
		Santiago Canyon	-	-	11	4
		OC Subtotal	25	29	65	40
Supply Subtotal/Average			62	83	125	90
0955.00	Laboratory Science Technology	LA Trade-Tech	21	14	-	12
		Mt San Antonio	2	2	2	2
		LA Subtotal	23	16	2	14
Supply Subtotal/Average			23	16	2	14
Supply Total/Average			85	99	127	104

Non-Community College Supply—Since some of these occupations typically require a bachelor’s degree, it is important to consider the supply from four-year institutions in the region that provide training programs for biotechnology. Exhibit 4 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), and Computational Biology (26.1104). Due to different data collection periods, the most recent three-year period of available data is from 2014 to 2017. Between 2014 and 2017, four-year colleges in the region conferred an average of 79 awards annually in related training programs.

Exhibit 4: Regional non-community college awards, 2014-2017

CIP Code	Program	College	2014-2015 Awards	2015-2016 Awards	2016-2017 Awards	3-Year Award Average
15.0401	Biomedical Technology/ Technician	DeVry University-California	17	8	19	15
		Southern California Institute of Technology	61	62	68	64
26.1104	Computational Biology	Pitzer College	1	-	-	0
Supply Total/Average			79	70	87	79

Appendix A: Occupational demand and wage data by county

Exhibit 5. Orange County

Occupation (SOC)	2019 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)
Agricultural and Food Science Technicians (19-4011)	179	183	4	2%	23	\$14.74	\$17.71	\$24.77
Biological Technicians (19-4021)	511	533	22	4%	59	\$17.25	\$22.19	\$28.42
Chemical Technicians (19-4031)	611	637	26	4%	67	\$17.60	\$23.29	\$32.06
Forensic Science Technicians (19-4092)	208	225	17	8%	29	\$33.72	\$43.27	\$55.84
Life, Physical, and Social Science Technicians, All Other (19-4099)	889	953	64	7%	122	\$17.96	\$24.41	\$30.63
Medical Equipment Repairers (49-9062)	793	806	13	2%	87	\$21.53	\$30.46	\$41.14
Total	3,191	3,337	146	5%	387			

Exhibit 6. Los Angeles County

Occupation (SOC)	2019 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)
Agricultural and Food Science Technicians (19-4011)	506	508	2	0%	63	\$15.15	\$18.19	\$25.38
Biological Technicians (19-4021)	1,424	1,461	37	3%	159	\$17.72	\$22.79	\$29.19
Chemical Technicians (19-4031)	1,337	1,338	1	0%	137	\$17.43	\$23.06	\$31.74
Forensic Science Technicians (19-4092)	816	879	63	8%	113	\$35.69	\$45.84	\$59.22
Life, Physical, and Social Science Technicians, All Other (19-4099)	2,144	2,201	57	3%	269	\$18.82	\$25.60	\$32.13
Medical Equipment Repairers (49-9062)	1,548	1,598	50	3%	176	\$19.12	\$27.08	\$36.64
Total	7,775	7,985	210	3%	917			

Exhibit 7. Los Angeles and Orange Counties

Occupation (SOC)	2019 Jobs	2024 Jobs	5-Yr Change	5-Yr % Change	Annual Openings
Agricultural and Food Science Technicians (19-4011)	685	691	6	1%	85
Biological Technicians (19-4021)	1,936	1,994	58	3%	218
Chemical Technicians (19-4031)	1,948	1,975	27	1%	204
Forensic Science Technicians (19-4092)	1,024	1,104	80	8%	142
Life, Physical, and Social Science Technicians, All Other (19-4099)	3,033	3,154	121	4%	391
Medical Equipment Repairers (49-9062)	2,340	2,404	64	3%	263
Total	10,966	11,322	356	3%	1,304

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)

For more information, please contact:

Jesse Crete, Ed. D., Director
Center of Excellence, Orange County
crete_jesse@rscdd.edu

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