

## Program Endorsement Brief: 0430.00/Biotechnology and Biomedical Technology *Biotechnology*

Los Angeles/Orange County Center of Excellence, January 2020

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### Summary Analysis

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 for five occupations related to biotechnology. Some biotechnology occupations typically require workers to obtain a bachelor's degree or higher. To illuminate which occupations are immediately accessible to community college graduates, the biotechnology occupations in this report have been separated into middle-skill and above middle-skill occupations. Middle-skill occupations typically require some postsecondary education, but less than a bachelor's degree.<sup>1</sup>

The occupations included in the **middle-skill** biotechnology occupation group are: Clinical Laboratory Technologists and Technicians (29-2018), Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061), and Medical Equipment Repairers (49-9062). The occupations in the **above middle-skill** group are: Biomedical Engineers (17-2031) and Biological Technicians (19-4021). 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 biotechnology occupations in the region. **Therefore, the COE endorses this proposed program.** Reasons include:

### Demand:

- Over the next five years, there is projected to be **3,856 middle-skill jobs available annually** in the region due to retirements and workers leaving the field, **which is more than the 123 awards conferred annually** by educational institutions in the region.
- National-level educational attainment data for the three middle-skill occupations indicates that between 38% and 48% of workers in the field have completed some college or an associate degree.
  - Typical **entry-level hourly wages** for middle-skill biotechnology occupations throughout the region are between **\$14.56 and \$20.40**. Entry-level wages for inspectors, testers, sorters, samplers, and weighers is lower than the California Family Needs Calculator hourly wage for one adult in the region (\$15.04 in Los Angeles County and \$17.36 in Orange County)<sup>2</sup>.
  - Median wages for middle-skill biotechnology occupations are between \$19.17 and \$28.01, which are higher than the California Family Needs Calculator hourly wage estimate for both counties.

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<sup>1</sup> 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.

<sup>2</sup> Living wage data was pulled from California Family Needs Calculator on 1/02/20. For more information, visit the California Family Needs Calculator website: <https://insightccd.org/2018-family-needs-calculator/>.

### Supply:

- **Eight community colleges** in the region have biotechnology programs, conferring an average of **62 awards annually** between 2015 and 2018.
- Between 2013 and 2016, an average of **61 awards were conferred** in related training programs by non-community college institutions.

### Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for **middle-skill** biotechnology jobs. In Los Angeles/Orange County, the number of middle-skill biotechnology jobs is projected to decrease by 3%, or 1,108 jobs, through 2023. Despite this, there will be over 3,850 job openings per year through 2023 due to retirements and workers leaving the field.

**Exhibit 1: Middle-skill occupational demand in Los Angeles and Orange Counties** <sup>3</sup>

Geography	2018 Jobs	2023 Jobs	2018-2023 Change	2018-2023 % Change	Annual Openings
Los Angeles	26,302	25,316	(986)	(4%)	2,635
Orange	11,601	11,479	(122)	(1%)	1,221
<b>Total</b>	<b>37,903</b>	<b>36,795</b>	<b>(1,108)</b>	<b>(3%)</b>	<b>3,856</b>

**Wages** — Typical entry-level wages for the middle-skill biotechnology occupational group throughout the region are between \$14.56 and \$20.40.<sup>4</sup> Entry-level wages for inspectors, testers, sorters, samplers, and weighers are lower than the California Family Needs Calculator hourly wage for one adult in the region (\$15.04 in Los Angeles County and \$17.36 in Orange County). Median wages for middle-skill biotechnology occupations are between \$19.17 and \$28.01, which is higher than the California Family Needs Calculator wage estimates for both counties. Wage information, by county, is included in Appendix A.

**Job Postings** — There were 8,580 online job postings related to the middle-skill group of occupations listed in the region over the past 12 months. The highest number of job postings were for laboratory technician, quality inspector, laboratory assistant, and quality assurance specialist. The top specialized skills were: quality assurance and control, micrometers, data entry, and chemistry. The top employers, by number of job postings, in the region were: Quest Diagnostics, Inc., UCLA Health, and University of Southern California. Of the 8,580 online job postings, 53% listed a minimum education requirement.

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

<sup>4</sup> Entry-level wage is defined as the twenty-fifth percentile hourly wage. Wages for experienced workers are defined as the seventy-fifth percentile hourly wage.

During the same time period, there were 132 online job postings for the above middle-skill group of occupations listed in the region. The highest number of job postings were for staff research associate, imaging service engineer, microbiology technician, and microbiology technologist. The top specialized skills were microbiology, experiments, laboratory equipment, and molecular biology. The top employers were University of California, Los Angeles (UCLA), North American Science Associates, and University of California, Irvine (UCI). Of the 132 online job postings, 23% listed a minimum education requirement.

**Educational Attainment** — The Bureau of Labor Statistics (BLS) lists a high school diploma or equivalent as the typical entry-level education for inspectors, testers, sorters, samplers, and weighers; and an associate degree as the typical entry-level education for Clinical Laboratory Technologists and Technicians, and Medical Equipment Repairers. The national-level educational attainment data indicates between 38% and 48% of workers in the middle-skill group of occupations have completed some college or an associate degree as their highest level of education. Of the 53% of middle-skill job postings listing a minimum education requirement in Los Angeles/Orange County, 87% (3,931) requested a high school diploma or vocational training, and 13% (590) requested an associate degree.

The Bureau of Labor Statistics (BLS) lists a bachelor’s degree as the typical entry-level education for Biological Technicians, and Biomedical Engineers. Between 17% and 35% of workers in the above middle-skill group of occupations have completed some college or an associate degree as their highest level of education. Of the 23% of online job postings listing a minimum education requirement in Los Angeles/Orange County, 6% (24) requested a high school diploma or vocational training and 2% (6) requested an associate degree.

**Supply**

**Community College Supply** — Exhibit 2 shows the annual and three-year average number of awards conferred by community colleges in Biotechnology (0430.00). Cumulatively, the eight community colleges in the region with biotechnology programs have conferred an average of 62 awards over the past three years. The colleges with the most completions were Pasadena and Citrus. 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), 2015-2018**

TOP Code	Program	College	2015-2016 Awards	2016-2017 Awards	2017-2018 Awards	3-Year Award Average
0430.00	Biotechnology	Citrus	10	18	16	15
		LA Mission	-	-	14	5
		LA Trade	3	3	5	4
		Pasadena	14	16	19	16
		<b>LA Subtotal</b>	<b>27</b>	<b>37</b>	<b>54</b>	<b>40</b>

TOP Code	Program	College	2015-2016 Awards	2016-2017 Awards	2017-2018 Awards	3-Year Award Average
		Fullerton	4	4	3	4
		Irvine	1	8	13	7
		Santa Ana	3	13	13	10
		Santiago Canyon	5	-	-	2
		<b>OC Subtotal</b>	<b>13</b>	<b>25</b>	<b>29</b>	<b>22</b>
		<b>Supply Total/Average</b>	<b>40</b>	<b>62</b>	<b>83</b>	<b>62</b>

**Non-Community College Supply** — It is important to consider the supply from other higher education institutions in the region that provide training programs for biotechnology occupations. Exhibit 3 shows the annual and three-year average number of awards conferred by non-community college institutions in Biomedical Technology/Technician (15.0401). Due to different data collection periods, the most recent three-year period of available data is 2013 to 2016. Between 2013 and 2016, one private institution conferred an average of 61 awards in the related training program.

**Exhibit 3: Regional Non-Community College awards, 2013-2016**

CIP Code	Program	College	2013-2014 Awards	2014-2015 Awards	2015-2016 Awards	3-Year Award Average
15.0401	Biomedical Technology/Technician	Southern California Institute of Technology	59	61	62	61
		<b>Supply Total/Average</b>	<b>59</b>	<b>61</b>	<b>62</b>	<b>61</b>

Appendix A: Occupational demand and wage data by county

Exhibit 4. Los Angeles County

Occupation (SOC)	2018 Jobs	2023 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	16,613	15,147	(1,466)	(9%)	1,903	\$14.48	\$19.07	\$26.04
Clinical Laboratory Technologists and Technicians (29-2018)	8,354	8,777	423	5%	604	\$17.78	\$24.47	\$37.44
Medical Equipment Repairers (49-9062)	1,334	1,391	57	4%	128	\$19.58	\$26.92	\$37.98
<b>Middle-Skill Subtotal</b>	<b>26,302</b>	<b>25,316</b>	<b>(986)</b>	<b>(4%)</b>	<b>2,635</b>			
Biological Technicians (19-4021)	2,164	2,251	87	4%	225	\$19.10	\$24.27	\$31.14
Biomedical Engineers (17-2031)	584	577	(7)	(1%)	38	\$29.76	\$45.10	\$59.34
<b>Above Middle-Skill Subtotal</b>	<b>2,748</b>	<b>2,828</b>	<b>80</b>	<b>3%</b>	<b>263</b>			
<b>Total</b>	<b>29,049</b>	<b>28,143</b>	<b>(906)</b>	<b>(3%)</b>	<b>2,898</b>			

Exhibit 5. Orange County

Occupation (SOC)	2018 Jobs	2023 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	7,984	7,606	(378)	(5%)	927	\$14.74	\$19.40	\$26.47
Clinical Laboratory Technologists and Technicians (29-2018)	2,954	3,198	244	8%	235	\$18.66	\$25.69	\$39.30
Medical Equipment Repairers (49-9062)	664	675	11	2%	60	\$22.05	\$30.30	\$42.70
<b>Middle-Skill Subtotal</b>	<b>11,601</b>	<b>11,479</b>	<b>(122)</b>	<b>(1%)</b>	<b>1,221</b>			
Biological Technicians (19-4021)	685	696	11	2%	67	\$18.67	\$23.73	\$30.44
Biomedical Engineers (17-2031)	446	467	21	5%	34	\$30.78	\$46.64	\$61.37
<b>Above Middle-Skill Subtotal</b>	<b>1,130</b>	<b>1,164</b>	<b>34</b>	<b>3%</b>	<b>101</b>			
<b>Total</b>	<b>12,732</b>	<b>12,642</b>	<b>(90)</b>	<b>(1%)</b>	<b>1,322</b>			

### Exhibit 6. Los Angeles and Orange Counties

Occupation (SOC)	2018 Jobs	2023 Jobs	5-Yr Change	5-Yr % Change	Annual Openings	Entry-Level Hourly Earnings (25 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	24,597	22,753	(1,844)	(7%)	2,830	\$14.56	\$19.17	\$26.18
Clinical Laboratory Technologists and Technicians (29-2018)	11,308	11,975	667	6%	838	\$18.00	\$24.80	\$37.90
Medical Equipment Repairers (49-9062)	1,998	2,067	69	3%	187	\$20.40	\$28.01	\$39.35
<b>Middle-Skill Subtotal</b>	<b>37,903</b>	<b>36,795</b>	<b>(1,108)</b>	<b>(3%)</b>	<b>3,856</b>			
Biological Technicians (19-4021)	2,848	2,947	99	3%	292	\$19.00	\$24.14	\$30.97
Biomedical Engineers (17-2031)	1,030	1,044	14	1%	72	\$30.20	\$45.74	\$60.22
<b>Above Middle-Skill Subtotal</b>	<b>3,878</b>	<b>3,991</b>	<b>113</b>	<b>3%</b>	<b>364</b>			
<b>Total</b>	<b>41,781</b>	<b>40,786</b>	<b>(995)</b>	<b>(2%)</b>	<b>4,220</b>			

#### 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
- Employment Development Department, Unemployment Insurance Dataset
- Living Insight Center for Community Economic Development
- California Community Colleges Chancellor's Office Management Information Systems
- California Family Needs Calculator, Insight Center for Community Economic Development
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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