

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

Los Angeles/Orange County Center of Excellence, March 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 related to five middle-skill occupations: Manufacturing Production Technicians (17-3029.09), Quality Control Analysts (19-4099.01), Medical and Clinical Laboratory Technicians (29-2012), 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.<sup>1</sup> 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 biomanufacturing technician occupations in the region. **Therefore, the COE endorses this proposed program.** Reasons include:

### **Demand:**

- Over the next five years, there is projected to be **4,446 jobs available annually** in the region due to new job growth and replacements, which is **more than the 233 awards conferred annually** by educational institutions in the region.
  - However, four of the five SOC codes within the report include a variety of occupations not solely related to biomanufacturing. Since these SOC codes do not solely represent biomanufacturing, **the number of annual job openings is likely overstated.**
- Over the past 12 months, there were **3,691 online job postings related to these program occupations.** The highest number of job postings were for manufacturing technician, equipment technician, biomedical technician, quality assurance specialist, and quality assurance technician.
- The national-level educational attainment data indicates between 35.6% and 53.1% of workers in the field have completed some college or an associate degree.
- Typical **entry-level hourly wages** for technician occupations related to biomanufacturing throughout the region are between \$14.56 and \$24.57.

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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.

- **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)<sup>2</sup>.
- **Entry-level wages for Life, Physical, and Social Science Technicians, All Other** are higher than the living wage in Los Angeles County, but **lower than the living wage in Orange County**.
- **Entry-level wages for the three remaining biomanufacturing technician occupations** (Engineering Technicians, Except Drafters, All Other; Clinical Laboratory Technologists and Technicians; and Medical Equipment Repairers) **exceed the California Family Needs Calculator hourly wage for one adult in the region**.
- **Experienced workers** can expect to earn between \$26.18 and \$41.60, which is **higher than the California Family Needs Calculator wage estimates for both counties**.

**Supply:**

- There are **14 community colleges** in the region that have biotechnology and biomedical technology, laboratory science technology, and/or manufacturing and industrial technology programs, conferring an average of **172 awards annually** between 2016 and 2019.
- Between 2013 and 2016, there were an average of **61 awards conferred annually** in one related training program by a non-community college institution.

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<sup>2</sup> Living wage data was pulled from California Family Needs Calculator on 3/2/20. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

## Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for five biomanufacturing technician-related occupations. In Los Angeles/Orange County, the number of jobs related to these occupations is projected to decrease by 2% through 2023. However, there will be more than 4,400 job openings per year through 2023 due to retirements and workers leaving the field.

Occupational demand for biomanufacturing technicians may be inflated for the following reasons:

- Engineering Technicians, Except Drafters, All Other (17-3029) SOC code includes a variety of related emerging occupations such as Manufacturing Production Technicians (17-3029.09); however, all of the included emerging occupations are not solely related to biomanufacturing technology. Therefore, the data in Exhibit 1 is likely overstated for biomanufacturing technician occupations.
- Life, Physical, and Social Science Technicians, all other (19-4099) SOC code includes a variety of related emerging occupations such as Quality Control Analysts (19-4099.01); however, all of the included emerging occupations are not solely related to biological technology. Therefore, the data in Exhibit 1 is likely overstated for life, physical, and social science technician occupations.
- Emsi uses a single aggregate code that combines Medical and Clinical Laboratory Technologists (29-2011), which is an above middle-skill occupation, and Medical and Clinical Laboratory Technicians (29-2012). Since these two occupations are combined within the dataset, it is likely that the demand and wage data for Medical and Clinical Laboratory Technicians is overstated.
- Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061) work in many different manufacturing sub-industries, not only biological technology. Therefore, the data for this occupation is likely overstated, as it includes Inspectors, Testers, Sorters, Samplers, and Weighers across all industries.

**Exhibit 1: 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	30,097	29,149	(948)	(3%)	3,031
Orange	13,355	13,323	(32)	(0%)	1,415
<b>Total</b>	<b>43,452</b>	<b>42,472</b>	<b>(980)</b>	<b>(2%)</b>	<b>4,446</b>

**Wages** — Typical entry-level hourly wages for biomanufacturing technician occupations throughout the region are between \$14.56 and \$24.57.<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

<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.

County)<sup>5</sup>. Entry-level wages for Life, Physical, and Social Science Technicians, All Other are higher than the living wage in Los Angeles County, but lower than the living wage in Orange County. Entry-level wages for the three remaining biomanufacturing technician occupations (Engineering Technicians, Except Drafters, All Other; Clinical Laboratory Technologists and Technicians; and Medical Equipment Repairers) exceed the California Family Needs Calculator hourly wage for one adult in the region. Experienced workers can expect to earn between \$26.18 and \$41.60, which is higher than the California Family Needs Calculator wage estimates for both counties. Regional average wages are below the average statewide wage of \$25.83 for these occupations. Wage information, by county, is included in Appendix A.

**Job Postings** — There were 3,691 online job postings related biomanufacturing technician occupations listed in the past 12 months. The highest number of job postings were for manufacturing technician, equipment technician, biomedical technician, quality assurance specialist, and quality assurance technician. The top skills were: quality assurance and control, repair, chemistry, good manufacturing practices (GMP), and electronics industry knowledge. The top three employers, by number of job postings, in the region were: Sodexo, B Braun Medical, and Applied Medical. Of the 3,691 online job postings, 64% list a minimum education requirement.

**Educational Attainment** — The Bureau of Labor Statistics (BLS) lists an associate degree as the typical entry-level education for the following four occupations: Engineering Technicians, Except Drafters, All Other; Life, Physical and Social Science Technicians, All Other; Clinical Laboratory Technologist and Technicians; and Medical Equipment Repairers. Inspectors, Testers, Sorters, Samplers, and Weighers typically require a high school diploma. The national-level educational attainment data indicates between 35.6% and 53.1% of workers in the field have completed some college or an associate degree. Of the 64% of biomanufacturing technician job postings listing a minimum education requirement in Los Angeles/Orange County, 82% (1,674) requested a high school diploma and 18% (375) 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 the related TOP codes: Biotechnology and Biomedical Technology (0430.00), Laboratory Science Technology (0955.00), and Manufacturing and Industrial Technology (0956.00). The colleges with the most completions in the region are Santiago Canyon, Irvine, Citrus and Pasadena. During 2019, there were five other related program recommendation requests from regional community colleges.

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<sup>5</sup> Living wage data was pulled from California Family Needs Calculator on 3/2/20. For more information, visit the California Family Needs Calculator website: <https://insightcced.org/2018-family-needs-calculator/>.

**Exhibit 2: Regional community college awards (certificates and degrees), 2016-2019**

<b>TOP Code</b>	<b>Program</b>	<b>College</b>	<b>2016-2017 Awards</b>	<b>2017-2018 Awards</b>	<b>2018-2019 Awards</b>	<b>3-Year Award Average</b>
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
		<b>LA Subtotal</b>	<b>37</b>	<b>54</b>	<b>60</b>	<b>50</b>
		Fullerton	4	3	18	8
		Irvine	8	13	25	15
		Santa Ana	13	13	11	12
		Santiago Canyon	-	-	11	4
		<b>OC Subtotal</b>	<b>25</b>	<b>29</b>	<b>65</b>	<b>40</b>
<b>Supply Subtotal/Average</b>			<b>62</b>	<b>83</b>	<b>125</b>	<b>90</b>
0955.00	Laboratory Science Technology	LA Trade-Tech	21	14	-	12
		Mt San Antonio	2	2	2	2
		<b>LA Subtotal</b>	<b>23</b>	<b>16</b>	<b>2</b>	<b>14</b>
<b>Supply Subtotal/Average</b>			<b>23</b>	<b>16</b>	<b>2</b>	<b>14</b>
0956.00	Manufacturing and Industrial Technology	Cerritos	3	6	2	4
		Compton	-	2	-	1
		El Camino	3	3	2	3
		LA Trade-Tech	-	-	5	2
		LA Valley	4	2	3	3
		Mt San Antonio	19	9	13	14
		<b>LA Subtotal</b>	<b>29</b>	<b>22</b>	<b>25</b>	<b>25</b>
		Fullerton	3	11	9	8
		Irvine	7	1	3	4
		Saddleback	5	9	11	8
		Santa Ana	-	1	-	0
		Santiago Canyon	-	27	41	23
		<b>OC Subtotal</b>	<b>15</b>	<b>49</b>	<b>64</b>	<b>43</b>
<b>Supply Subtotal/Average</b>			<b>44</b>	<b>71</b>	<b>89</b>	<b>68</b>
<b>Supply Total/Average</b>			<b>129</b>	<b>170</b>	<b>216</b>	<b>172</b>

**Non-Community College Supply** — It is important to consider the supply from non-community colleges in the region that provide training programs for biological technology occupations. Exhibit 3 shows the annual and three-year average number of awards conferred by one institution in the related Classification of Instructional Programs (CIP) Code: Biomedical Technology/Technician (15.0401). Due to different data collection periods, the most recent three-year period of available data is from 2013 to 2016. Between 2013 and 2016, four-year colleges in the region conferred an average of 61 awards annually in related training programs.

**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)
Engineering Technicians, Except Drafters, All Other (17-3029)	1,912	1,889	(23)	(1%)	164	\$24.57	\$32.10	\$41.62
Life, Physical, and Social Science Technicians, All Other (19-4099)	1,883	1,944	61	3%	232	\$17.33	\$23.30	\$29.33
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
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	16,613	15,147	(1,466)	(9%)	1,903	\$14.48	\$19.07	\$26.04
<b>Total</b>	<b>30,097</b>	<b>29,149</b>	<b>(948)</b>	<b>(3%)</b>	<b>3,031</b>			

**Exhibit 5. Orange County**

<b>Occupation (SOC)</b>	<b>2018 Jobs</b>	<b>2023 Jobs</b>	<b>5-Yr Change</b>	<b>5-Yr % Change</b>	<b>Annual Openings</b>	<b>Entry-Level Hourly Earnings (25th Percentile)</b>	<b>Median Hourly Earnings</b>	<b>Experienced Hourly Earnings (75th Percentile)</b>
Engineering Technicians, Except Drafters, All Other (17-3029)	995	1,033	38	4%	94	\$24.56	\$32.08	\$41.58
Life, Physical, and Social Science Technicians, All Other (19-4099)	758	811	53	7%	100	\$16.95	\$22.80	\$28.66
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
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	7,984	7,606	(378)	(5%)	927	\$14.74	\$19.40	\$26.47
<b>Total</b>	<b>13,355</b>	<b>13,323</b>	<b>(32)</b>	<b>(0%)</b>	<b>1,415</b>			

**Exhibit 6. Los Angeles and Orange Counties**

<b>Occupation (SOC)</b>	<b>2018 Jobs</b>	<b>2023 Jobs</b>	<b>5-Yr Change</b>	<b>5-Yr % Change</b>	<b>Annual Openings</b>	<b>Entry-Level Hourly Earnings (25<sup>th</sup> Percentile)</b>	<b>Median Hourly Earnings</b>	<b>Experienced Hourly Earnings (75<sup>th</sup> Percentile)</b>
Engineering Technicians, Except Drafters, All Other (17-3029)	2,908	2,922	14	0%	258	\$24.57	\$32.09	\$41.60
Life, Physical, and Social Science Technicians, All Other (19-4099)	2,642	2,755	113	4%	332	\$17.24	\$23.15	\$29.13
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
Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	24,597	22,753	(1,844)	(7%)	2,830	\$14.56	\$19.17	\$26.18
<b>Total</b>	<b>43,452</b>	<b>42,472</b>	<b>(980)</b>	<b>(2%)</b>	<b>4,446</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 (MIS)
- California Family Needs Calculator, Insight Center for Community Economic Development
- Chancellor's Office Curriculum Inventory (COCI 2.0)

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