

## Program Endorsement Brief: 0430.00 – Biotechnology and Biomedical Technology Biomanufacturing (Bachelor's Degree)

Los Angeles/Orange County Center of Excellence, January 2022

### Summary Analysis

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

- *Quality control systems managers* (11-3051.01), classified under *industrial production managers* (11-3051)
- *Biological technicians* (19-4021)

Middle-skill occupations are those that typically require some postsecondary education, but less than a bachelor's degree.<sup>1</sup> However, since this program recommendation is for a bachelor's level program, two above middle-skill occupations were studied in this report. 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 or other local educational institutions that align with the relevant occupations.

Based on the available data, there appears to be a regional supply gap for the two occupations in this report. In addition to the majority of job openings having entry-level wages above the self-sufficiency standard wage in both Los Angeles and Orange counties, nearly one-third or more of incumbent workers have completed at least some college or an associate degree. **Therefore, due to the criteria being met, the COE endorses this proposed program.** Detailed reasons include:

<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.

**Demand:**

- **Supply Gap Criteria** – Over the next five years, there is projected to be **701 jobs available annually** in the region due to replacements, **which is more than the 16 awards conferred annually** by educational institutions in the region.
- **Living Wage Criteria** – In Los Angeles County, the majority (62%) of annual job openings for the two occupations in this report have entry-level wages **above** the self-sufficiency standard wage (\$18.10/hour).<sup>2</sup>
- **Educational Criteria** – Within the LA/OC region, **all of the annual job openings** for the two occupations of interest **typically require a bachelor's degree**.
  - National-level educational attainment data indicates between **29% and 37% of workers in the field have completed some college or an associate degree**.

**Supply:**

- Between 2016 and 2019, there was an average of **16 awards conferred annually** in related training programs by non-community college institutions.

---

Self-Sufficiency Standard wage data was pulled from The Self-Sufficiency Standard Tool for California on 1/5/2022. For more information, visit: <http://selfsufficiencystandard.org/california>.

## Occupational Demand

Exhibit 1 shows the five-year occupational demand projections for the two occupations in this report. In Los Angeles/Orange County, the number of jobs related to this occupation is projected to decrease by 4% through 2025. However, there will be 701 job openings per year through 2025 due to retirements and workers leaving the field.

*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 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 Counties<sup>3</sup>**

Geography	2020 Jobs	2025 Jobs	2020-2025 Change	2020-2025 % Change	Annual Openings
Los Angeles	6,969	6,618	(351)	(5%)	494
Orange	2,941	2,890	(51)	(2%)	206
<b>Total</b>	<b>9,910</b>	<b>9,508</b>	<b>(402)</b>	<b>(4%)</b>	<b>701</b>

## Wages

The labor market endorsement in this report considers the hourly wages for the two occupations in this report 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 (62%) of annual openings for these occupations have entry-level wages **above** the living wage for one adult (\$18.10 in Los Angeles County). Typical entry-level hourly wages are in a range between \$17.51 and \$38.44. Experienced workers can expect to earn wages between \$28.17 and \$69.00, which are above the self-sufficiency standard wage estimate.

**Orange County** — The majority (68%) of annual openings for these occupations have entry-level wages **above** the living wage for one adult (\$20.63 in Orange County). Typical entry-level hourly wages are in a range between \$18.16 and \$40.48. Experienced workers can expect to earn wages between \$29.21 and \$72.02, which are above the self-sufficiency standard wage estimate.

---

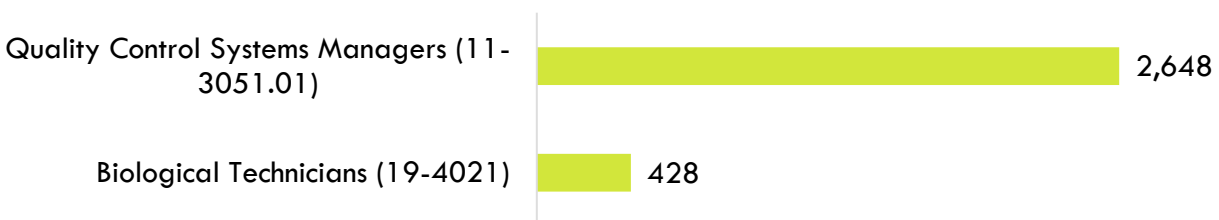
<sup>3</sup> Five-year change represents new job additions to the workforce. Annual openings include new jobs and replacement jobs that result from retirements and separations.

## Job Postings

Over the past 12 months, there have been 3,076 online job postings related to the two occupations of interest. Exhibit 2 displays the number of job postings by occupation. The majority of job postings (86%) were for *quality control systems managers*. The highest number of job postings were for quality assurance managers, quality managers, quality assurance supervisors, quality control managers, and research associates. The top skills were quality assurance and control, quality management, good manufacturing practices (GMP), project management, and chemistry. The top employers, by number of job postings, in the region were Gilead Sciences, Thermo Fisher Scientific, Inc., Danaher Corporation, Grifols, and Takeda Pharmaceutical Company.

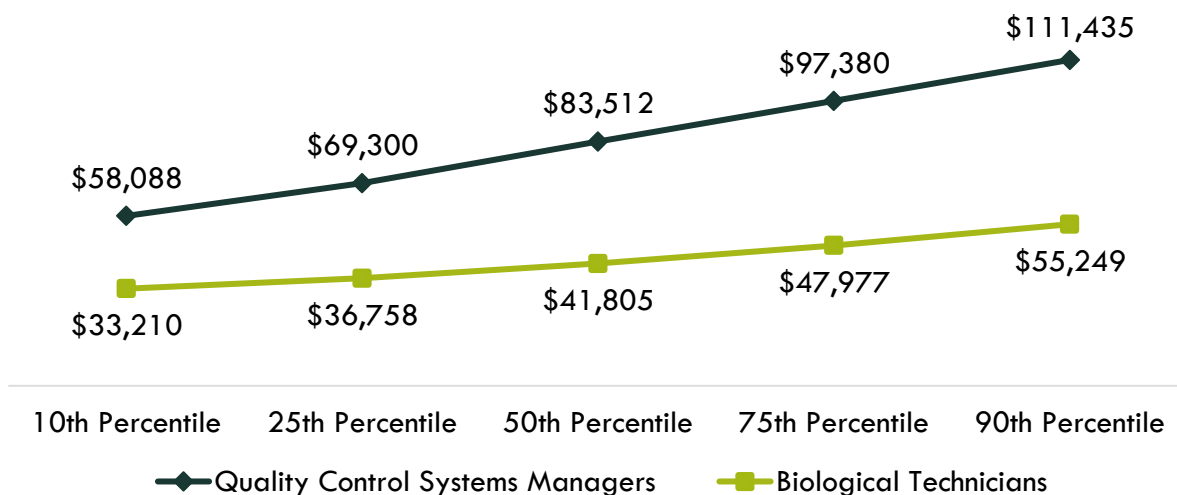
*It is important to note that the job postings data included in this section reflects online job postings listed in the past 12 months and does not yet demonstrate the full impact of COVID-19. While employers have generally posted fewer online job postings since the beginning of the pandemic, the long-term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

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



**Wages by Occupation** — The median salary for the occupations in this report are in a range between \$41,805 and \$83,512. Exhibit 3 displays the market salary percentiles from Burning Glass.

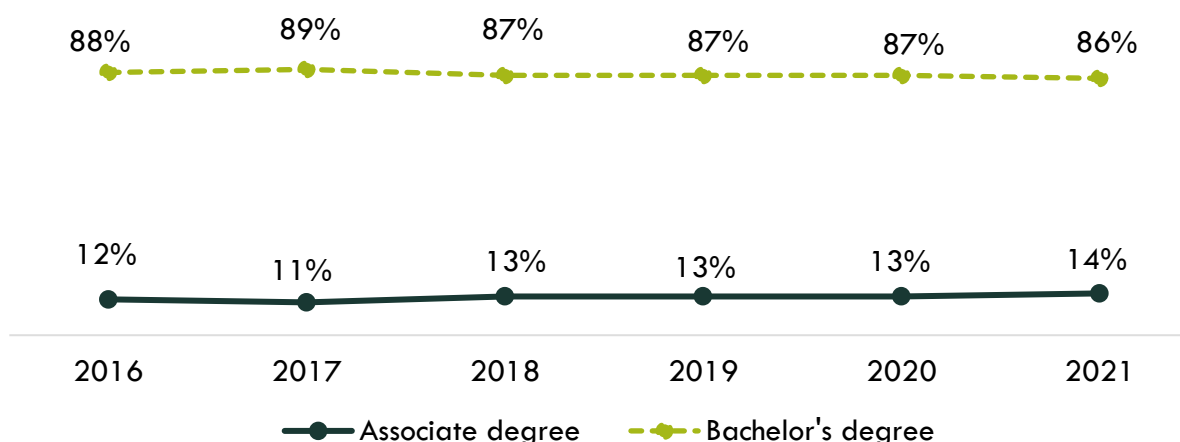
**Exhibit 3: Market salary percentiles by occupation**



## Educational Attainment

The Bureau of Labor Statistics (BLS) lists a bachelor's degree as the typical entry-level education for *industrial production managers* (11-3051) and *biological technicians* (19-4021). In the LA/OC region, all of annual job openings (100%) typically require a bachelor's degree. National-level educational attainment data indicates between 29% and 37% of workers in the two occupations in this report have completed some college or an associate degree. Employers posting job ads for the two occupations of interest show a consistent preference for candidates with a bachelor's degree. In 2021, 86% of the job postings for these positions requested candidates with a bachelor's degree.

**Exhibit 3: Minimum education requirements from job postings**



## Educational Supply

**Non-Community College Supply** — For a comprehensive regional supply analysis, it is important to consider the supply from non-community college institutions in the region that may provide training programs for the two occupations of interest. Exhibit 4 shows the annual and three-year average number of bachelor's-level awards conferred by these institutions across two programs. Between 2016 and 2019, non-community college institutions in the region conferred an average of 16 awards.

**Exhibit 4: Regional non-community college bachelor's 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
15.0702	Quality Control Technology/Technician	CSU-Dominguez Hills	5	5	3	4
		CSU-Northridge	-	-	1	0
Supply Total/Average			24	14	9	16

## 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 <sup>th</sup> Percentile)	Median Hourly Earnings	Experienced Hourly Earnings (75 <sup>th</sup> Percentile)
Industrial Production Managers (11-3051)	5,184	4,798	(386)	(7%)	307	\$38.44	\$50.64	\$69.00
Biological Technicians (19-4021)	1,785	1,820	35	2%	187	\$17.51	\$22.20	\$28.17
<b>Total</b>	<b>6,969</b>	<b>6,618</b>	<b>(351)</b>	<b>(5%)</b>	<b>494</b>	<b>-</b>	<b>-</b>	<b>-</b>

### Exhibit 6. Orange County

Occupation (SOC)	2020 Jobs	2025 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)
Industrial Production Managers (11-3051)	2,335	2,264	(71)	(3%)	141	\$40.48	\$52.98	\$72.02
Biological Technicians (19-4021)	607	625	18	3%	65	\$18.16	\$23.02	\$29.21
<b>Total</b>	<b>2,941</b>	<b>2,890</b>	<b>(51)</b>	<b>(2%)</b>	<b>206</b>	<b>-</b>	<b>-</b>	<b>-</b>

### 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
Industrial Production Managers (11-3051)	7,518	7,063	(455)	(6%)	448	Bachelors' degree
Biological Technicians (19-4021)	2,392	2,445	53	2%	253	Bachelors' degree
<b>Total</b>	<b>9,910</b>	<b>9,508</b>	<b>(402)</b>	<b>(4%)</b>	<b>701</b>	

## **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)

## **Appendix C: Additional Job Postings related to Biotechnology within the Manufacturing industry**

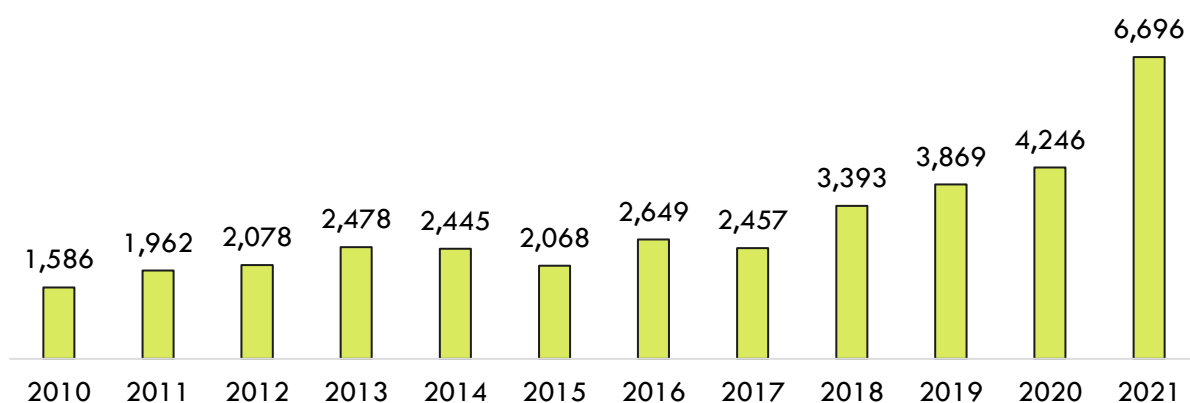
In addition to the job posting section related to the two occupations of interest on pages four and five of this report, an additional query of regional job posting data specific to biomanufacturing was conducted using the following criteria:

1. Job postings limited to Los Angeles County
2. Job postings limited to Biotech jobs within the Manufacturing industry
3. Job postings from the 12-month timeframe – Feb. 1, 2021 to Jan. 31, 2022.

The results of this specialized query yielded 7,327 job postings. While each individual job posting might not be precisely relevant to the proposed program, the overall findings from this biomanufacturing job posting search are undoubtedly important to the field as a whole and can be used to tailor the proposed program to the specific needs of regional employers.

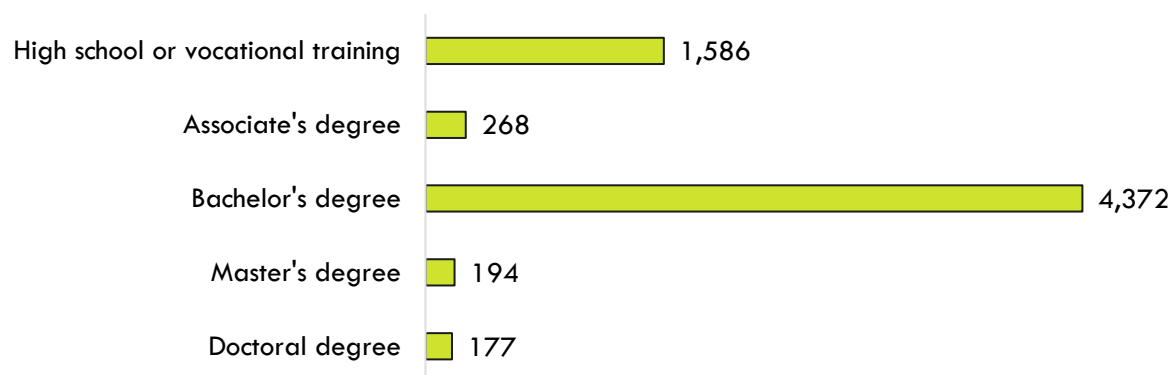
In order to put this query in perspective, it is useful to view historical job posting data first. Online job postings may provide additional insights about recent changes in the labor that are not yet captured by traditional LMI. Between 2010 and 2021, there was an average of 2,994 online job postings in Los Angeles County related to biomanufacturing. From 2020 to 2021 alone, biomanufacturing job postings increased by 58%, much faster than the overall job posting rate increase of 25% during this same timeframe. Exhibit 8 contains the number of job postings from each year, but please note that online job postings are not equal to labor market demand because employers may post a position multiple times and for various reasons. Thus, online job postings are used as a proxy for demand, and should be considered supplemental to traditional labor market information.

**Exhibit 8: Biomanufacturing job postings in LA County, 2010-2021**



As mentioned previously, the 7,327 job postings from the period of Feb. 1, 2021 to Jan. 31, 2022 are the subject each subsequent analysis. Overall, employers postings these job ads show a strong preference for candidates with a bachelor's degree, accounting for two-thirds of all postings. Exhibit 9 displays the minimum advertised education from these postings.

**Exhibit 9: Minimum advertised education requirement for biomanufacturing job postings**



The job postings are seeking a diverse set of roles for this industry. The table below displays the number of job postings by the twenty occupations with the most job ads. The occupations most relevant to the proposed program are highlighted in yellow, and are further analyzed in terms of minimum education requirements below.



<b>O*NET Code</b>	<b>Occupation</b>	<b>Job Postings</b>
15-1132.00	Software Developers, Applications	288
19-4099.01	Quality Control Analysts	263
11-9199.00	Managers, All Other	231
19-2031.00	Chemists	213
41-4012.00	Sales Representatives, Wholesale and Manufacturing, Except Technical and Scientific Products	200
15-1199.02	Computer Systems Engineers/Architects	193
11-2021.00	Marketing Managers	170
51-9061.00	Inspectors, Testers, Sorters, Samplers, and Weighers	166
51-9199.00	Production Workers, All Other	162
29-2012.00	Medical and Clinical Laboratory Technicians	162
17-3029.09	Manufacturing Production Technicians	159
11-2022.00	Sales Managers	153
11-3051.01	Quality Control Systems Managers	143
15-2031.00	Operations Research Analysts	130
19-1042.00	Medical Scientists, Except Epidemiologists	122

The occupations most relevant to the proposed program appear below, along with the portion of job ads requesting candidates with a bachelor's degree. As you can see, the two occupations from this report (Quality control systems managers (11-3051.01) and Biological technicians (19-4021)) are appear below and indicate a strong preference for candidates with a bachelor's degree at 90% and 85% of postings, respectively.

<b>O*NET Code</b>	<b>Occupation</b>	<b>% of Job Postings Requiring Bachelor's Degree</b>
19-4099.01	Quality Control Analysts	78%
51-9061.00	Inspectors, Testers, Sorters, Samplers, and Weighers	72%
17-3029.09	Manufacturing Production Technicians	50%
11-3051.01	Quality Control Systems Managers	90%
19-4021.00	Biological Technicians	85%

For more information, please contact:

Luke Meyer, Director  
Los Angeles/Orange County Center of Excellence  
[lmeyer7@mtsac.edu](mailto:lmeyer7@mtsac.edu)

