

2016 TALENT INTEGRATION

California Workforce Trends in the Life Science Industry

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2016 CALIFORNIA WORKFORCE TRENDS IN THE LIFE SCIENCE INDUSTRY

California's life science industry is a major driver of innovation, economic development and job creation, employing more than 281,000 individuals in the state in 2014ⁱ. As part of a dynamic industry characterized by disruptive discoveries, an ever-complex regulatory environment, and the globalization of health care, life science employers must secure the right talent for their organizations to survive and thrive.

In a second report since 2014ⁱⁱ, the Biocom Institute and the California Life Science Institute have collaborated to assess and forecast the most pressing talent needs of the state's life science industry. This report provides a snapshot of workforce trends in the dynamic California life science industry, including some of the key job opportunities and the corresponding educational backgrounds and skills that employers seekⁱⁱⁱ. It also provides a unique statewide perspective into the challenges and opportunities industry executives perceive in building the future workforce to drive the industry into the next decade.

BENEFICIARIES OF THE 2016 CALIFORNIA WORKFORCE TRENDS REPORT INCLUDE:

Company executives

who must build organizations, develop talent and allocate resources to address unmet medical and societal needs



Educators and trainers

who must prepare the next generation of industry professionals



Legislators

who must set policy and allocate resources based on industry and community needs



Recruiters

who must match available talent with evolving company needs



HR professionals

who must develop, engage and motivate staff



ⁱ 2016 California Life Sciences Industry Report, California Life Sciences Association

ⁱⁱ 2014 Talent Integration: California Workforce Trends in the Life Science Industry, BayBio Institute and Biocom Institute. The BayBio Institute became the California Life Sciences Institute in 2015.

ⁱⁱⁱ Interviews and job postings data for the 2016 California report are also included in a national report of the Coalition of State Bioscience Institutes (2016 CSBI National Workforce Trends Report), to which the Biocom Institute and the California Life Sciences Institute belong. As appropriate, some of the analyses, recommendations and quotes can be found in both reports.

2016 CALIFORNIA WORKFORCE TRENDS IN THE LIFE SCIENCE INDUSTRY (con't)

ABOUT THE STUDY

This report highlights current and anticipated skills needed for life science industry positions in California. The analysis is drawn from three quantitative and qualitative data sets:



Job Postings

Quantitative data from ~16,000 job postings for California life science technical jobs from representative industry NAICS codes, utilizing Burning Glass Technologies (Jan-Dec 2015). Non-technical positions in the industry, such as those in sales, accounting, purchasing, etc. are not included in this sample.



Survey Responses

Survey responses from human resource representatives in 248 California life science companies on actual (2014 - 2015) and expected (2016 - 2017) hires. The on-line surveys were completed during Q1 2016. They represent a 14% response rate from 1770 companies invited to participate. See Figure 1 below for a breakdown of the 248 companies by sector.



Interviews

Interviews with 34 California life science industry leaders (i.e., CEOs, research and business executives and human resource executives) in California during Q1 2016. Interviewees were asked a set of open-ended questions about industry trends, talent development and challenges. Selected excerpts are included in the report. See Figure 1 below for a breakdown of the 34 companies by sector.

The Institutes' survey and interview sample populations are derived from targeted outreach to member companies of the California life science trade associations to which the Institutes are affiliated: the California Life Sciences Association and Biocom. Figure 1 below compares the sample populations by sector to the universe of 8762 life science companies in California as defined by TEconomy/BIO^{iv}.

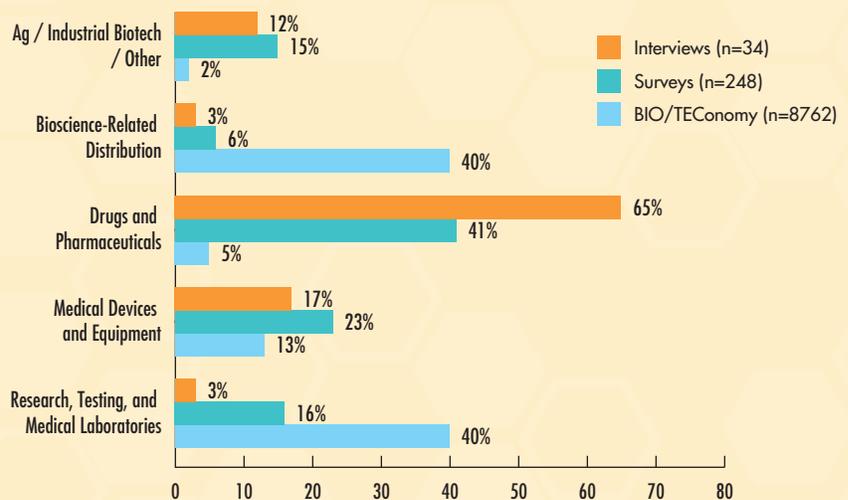


Figure 1 – California Life Science Company Sector Distribution compared with sector distribution of companies interviewed and surveyed in this study.

^{iv} TEconomy/BIO The Value of Bioscience Innovation in Growing Jobs and Improving Quality of Life 2016

AS COMPANIES EVOLVE, SO MUST THEIR TALENT

“We live in an industry that is impacted by continuous, incremental improvements in technologies. We constantly are incorporating these into the way we discover drugs. This is a complex, interdisciplinary process.”

“The opening of new markets creates new opportunities and provides access to new ideas and populations. It also creates new competitive pressures and requires us to think differently. When the Chinese government provides strong support and capital to establish local expertise throughout the life sciences R&D value chain, we have to take notice.”

The life science industry exists in a rapidly changing global environment. To remain competitive and relevant, the life science companies we interviewed described a landscape in which their organizations must continually evolve and respond to:

- new and unmet challenges in health, energy and environmental stewardship,
- technology and scientific breakthroughs,
- commercial and financial market dynamics,
- evolving regulatory and ethical environments, and
- a dynamic talent marketplace

It typically takes years for a life science company to move from concept to commercial product. A company may begin as a research-only organization. As it develops a product or service, it may grow in size and development and operational capabilities. Eventually it may grow into a commercial organization, adding more business and operational capabilities along the way.

As a company matures through these stages, its talent needs shift and the complex interplay between functions grow. A more mature organization may have many more specialists, but it also needs employees that can communicate across functional areas and drive informed decision-making while maintaining awareness of changes in the global, environmental and competitive landscape.



Industry executives are seeking employees who come to their organizations with an understanding of how the industry works: how to develop technology into innovative products/services, how the functional pieces fit together and how the external environment impacts internal decisions. Many employees thrive in such a dynamic environment, finding opportunities for learning, growth, creativity and advancement. These complex dynamics however can limit the opportunities for individual contributors who cannot think beyond their functional area, who lack strong communication and interpersonal skills and who are not adaptable.



“Linear, pre-defined career pathways of old no longer are the norm.”

“The days of lifetime employment in a single role in a single organization are generally gone. Organizations change and employees need to change with them. We also demand that activities move faster and more efficiently than ever before. Combined, these factors mean our employees need to be adaptive, flexible and agile.”

WHAT ARE COMPANIES LOOKING FOR?

Job and Functional Demand: An analysis of the approximately 16,000 statewide life science job postings for technical occupations from 2015 (Burning Glass Technologies) shows the highest demand for medical scientists - consistent with findings in the 2014 report - followed by various medical and clinical laboratory and scientific functions. Regulatory and quality occupations, when taken together, constitute the second highest area of job demand. Similarly, when looking at top skill sets, GMP and GCP together constitute the highest demand (Figures 2A and 2B).

Burning Glass Technologies (Burning Glass) employs an expanded definition for medical scientists beyond that used by the Bureau of Labor Statistics (BLS). In the BLS definition, the typical medical scientist employed by the life science industry is an individual with a PhD, usually in biology or a related life science, or an MD degree and conducting research aimed at understanding human diseases and improving overall human health. Included in the medical scientists' job category in Figure 2A, are job postings for candidates with bachelor's degrees as well, with a variety of job titles inclusive of Clinical Research Associates and Clinical Laboratory Scientists.

Top Occupations: California Life Science Job Postings

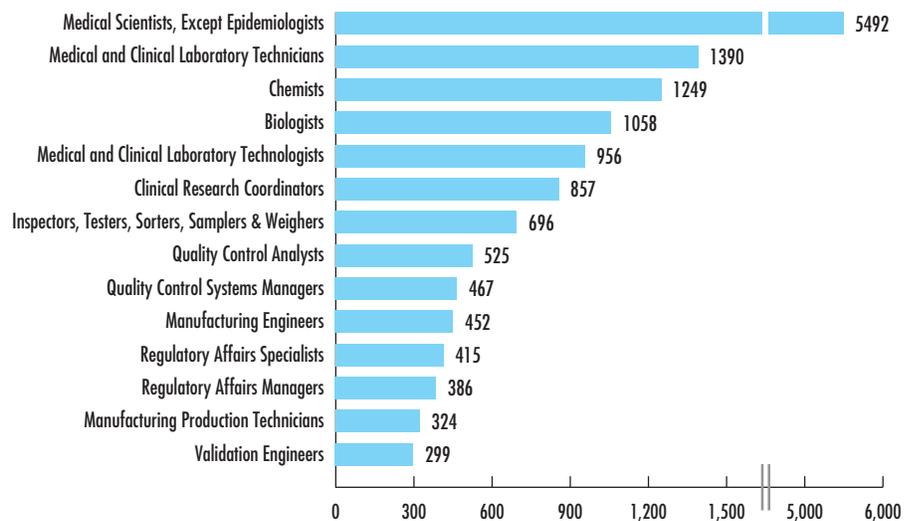


Figure 2A - Top 14 occupations in California based on approximately 16,000 online job posting in 2015 (Burning Glass Technologies)

Top Skills: California Life Science Job Postings

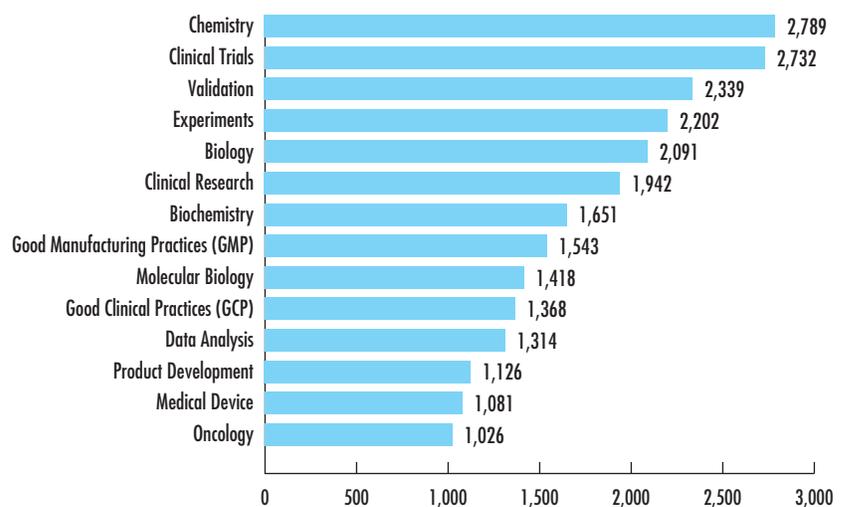


Figure 2B - California life science in-demand skills based on approximately 16,000 online job postings in 2015 (Burning Glass Technologies)

TRENDS IMPACTING TALENT NEEDS

In a dynamic life science industry, talent needs continue to evolve. New technologies, competition and other global developments create new talent demands. To complement the quantitative data, we interviewed 34 California life science industry executives, asking each a set of open-ended questions about key developments that are impacting their current and pipeline talent needs. Four key trends emerged from the interviews and are highlighted throughout the report.



FOUR KEY TRENDS

1. **Disruptive Advancements: Precision Medicine and Big Data**
2. **Value-Based Health Care**
3. **Depth and Breadth: An Emphasis on Soft Skills**
4. **Diversity**

TREND 1 - DISRUPTIVE ADVANCEMENTS: PRECISION MEDICINE AND BIG DATA

“The human genome project and its impact on proteomics, metabolism and big data have profound implications for the way we work and the skills we need to remain competitive. While we will not build expertise in all of these areas, we will need people who understand each of them and can work with partners who provide such technical expertise.”

“If the 1990s were the era of blockbuster drugs and the 2000s were the time of personalized medicine, we now are entering the age of massive amounts of data and truly individualized medicine. New skills will be needed in collecting, managing, analyzing and interpreting this research and real world clinical data for therapeutics and diagnostics applications.”

Technology advances, automation, advances in computing power and data storage capacity are allowing us to generate ever increasing amounts data. Today life science companies are using enormous datasets to advance precision medicine and genomics research, to understand newly emergent “modern-world” diseases, to meet the growing demands for energy, to protect the environment and to respond to increased regulatory demands. This and new developments in informatics, bioengineering, robotics, and artificial intelligence are requiring companies to hire staff with proficiency in data management, data storage, analytics, bioinformatics, biostatistics, and modeling.

Dramatic advancements in precision medicine and genomics have created a growing need for people who understand the complex interplay of genes in genomic systems and who can engineer whole pathways into organisms and not just single genes. It is also spiking demand for people who understand the full range of business implications for personalized medicine, including patient data protection and security.

“We need computational biologists who are able to incorporate more big data and analytics into life sciences R&D. This requires expertise in coding, mathematics and modeling - all areas where the pipeline of talent does not appear to be robust enough to meet the growing demand for talent.”

“Big data” involving sensitive patient information that might be shared across international jurisdictions creates enormous challenges that go well beyond current HIPAA concerns and challenges.”

DEGREE REQUIREMENTS

Approximately 12,000 of the 16,000 California job postings in 2015 listed degree requirements. An analysis of those postings shows that a majority of positions (70%) require a four-year college degree, up slightly from 2014 (Figure 3). This data is consistent with the findings from the interviews with 248 life science company HR professionals (data not shown).

“Community colleges represent potentially rich but underutilized target for talent pipeline partnership.”

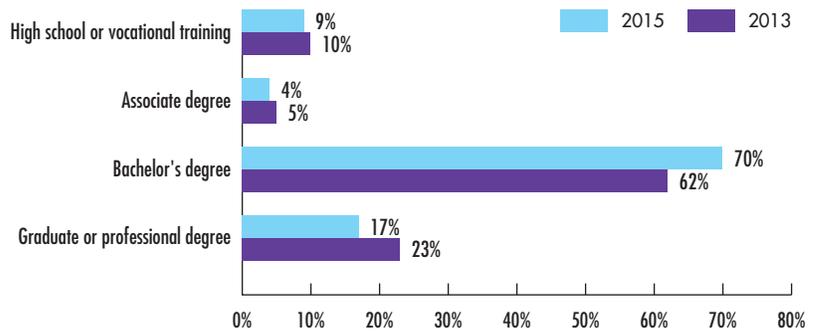


Figure 3 - Sample size is approximately 12,000 California online job postings, from the roughly 16,000 postings in 2015, and a comparable sample in 2013. The remaining jobs posted did not list degree requirements. (Burning Glass Technologies)

Survey respondents, when asked about degree requirements for projected hires over the next two years, indicated that over 25% of manufacturing, laboratory, IT and supply chain positions will require less than a four-year degree, whereas all projected engineering positions will require a four-year college degree or above. Research & Development (R&D) positions, more than any other function surveyed - at 25% - will require a PhD (Figure 4). Anecdotally, we know that some companies will consider work experience, including internships, in lieu of minimum degree requirements.

“We can help ourselves by helping the communities in which we work. One thing we should do is to reduce the strong bias around educational degrees. While degrees are important, there is a lot of untapped, local, raw talent and dedicated manpower. Many people lack the resources or opportunities to attend 4-year colleges. High tech has failed at engaging this talent, but the life science industry still has the opportunity.”

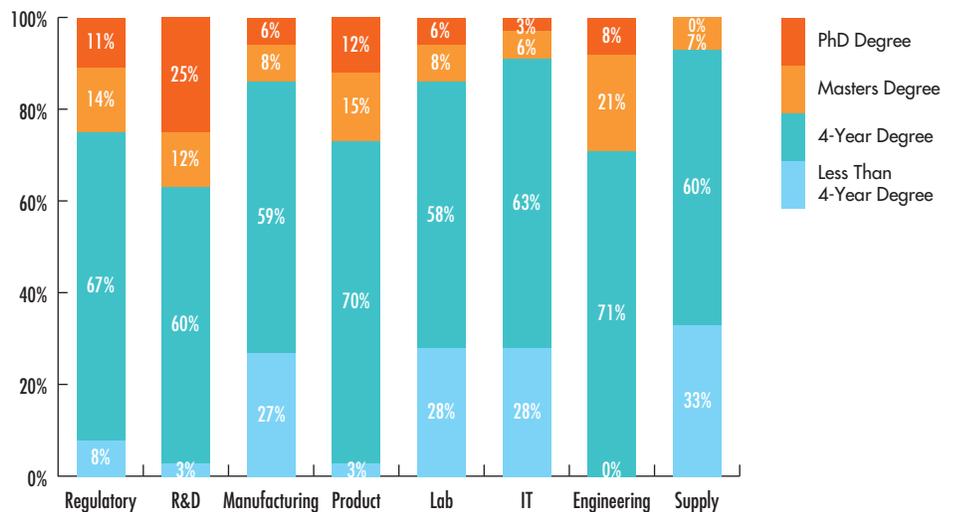


Figure 4 - Projected functional job openings and corresponding degree requirements over next two years, based on 248 survey respondents.

TREND 2 – VALUE-BASED HEALTH CARE

“...we will need talent across business functions that understand our science. We will have more people move from scientific roles into business roles. For example, our sales reps will need a new level of technical sophistication that enables them to educate physicians and other health care professionals”

A shift to value-based health care is creating the need for employees who understand how life science companies fit into the current health care system. Consumers are paying for more of their health care out of pocket and are more aware of health care costs. Health care providers are consequently demanding more from life science companies in terms of outcomes. The emphasis on value-based health care requires multiple new or expanded skill sets, including:

- Greater astuteness of the overall health care system
- Knowledge of developing risk-sharing programs and wrap-around programs
- An understanding of reimbursement
- Ability to work with hospitals and health care administrators
- Aptitude for structuring business partnerships and managing relationships
- Policy and regulatory expertise
- Negotiation and advanced sales capabilities (e.g., VPs and Sales Directors who are able to negotiate with C-Suite executives at health care systems versus a standard procurement approach)

Life science companies will need more employees who are technology or R&D experts, but who also understand and can align multiple stakeholders, and respond to external factors.

SURVEYED COMPANY PROFILES

A majority (69%) of the 248 survey respondents consisted of small companies, followed by medium (22%) and large (9%) companies, and were largely from the Drugs and Pharmaceuticals sector (41%) (Figure 5).

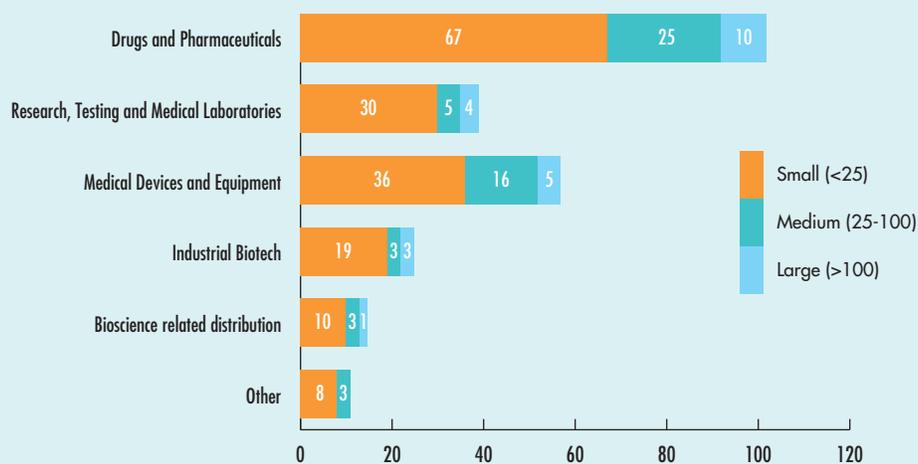


Figure 5 – Distribution by company size and sector of the 248 companies surveyed in this study.

DEMAND CONTINUES

Current & Projected Hires

The 248 life science human resource survey respondents projected a stable demand for new hires, indicating plans to hire approximately 4,700 employees over the next two years, a slight rise over total hires during the prior two years. Figure 6 shows this projected growth by company size, with over 50% of hires expected by companies with more than 100 employees[†] (Figure 6).

Number of Companies Surveyed / Average Number of Hires Per Company

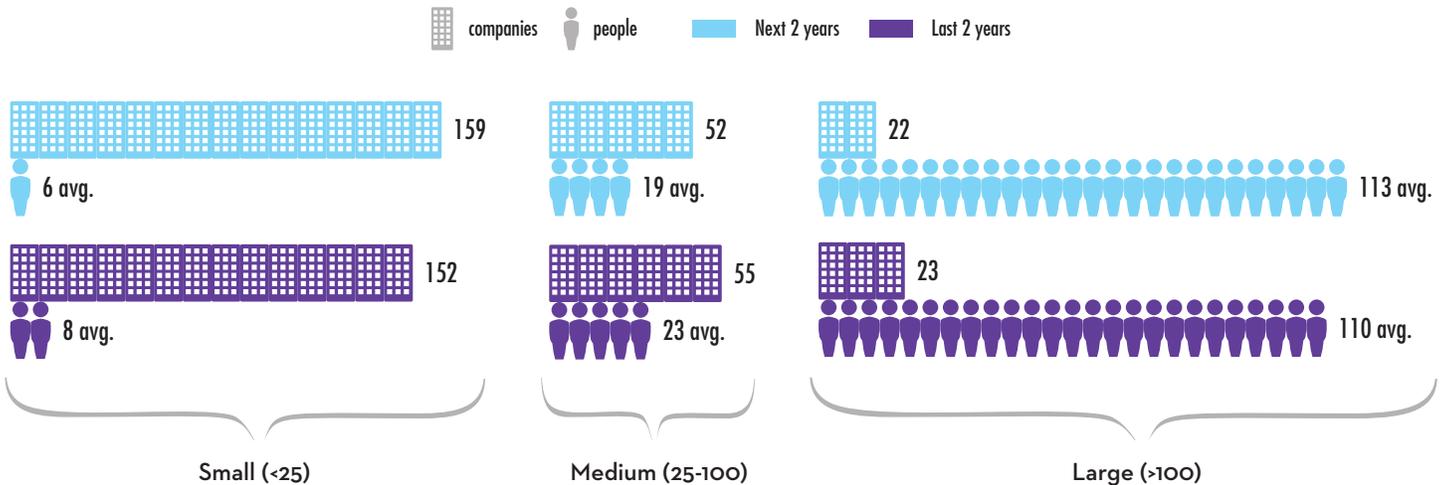


Figure 6

H1B VISAS

As some life science employers aren't always able to find the right talent in the U.S., they take advantage of the H1B visa program to meet their needs. Strategic collaborations can bolster the local and national talent pipeline to effectively meet skilled demand and reduce the reliance on recruiting talent from abroad.

SEARCH FOR TALENT

Data from survey of 248 HR Managers

- 67 of 248 (27%) companies surveyed employ H1B visa holders
- 3 very large companies (over 500 employees) employ on average 28 visa holders each
- 64 small, medium and large companies (26%) with fewer than 500 employees employ 1-6 visa holders each
- Six percent of respondents were "unsure"; the remaining 185 companies (67%) do not employ H1B visa holders
- The 67 H1B visa employers from the survey span all industry sectors with the exception of bioscience distribution



[†] The four company survey respondents with 500 or more employees are expected to add, on average, 414 employees over the next two years.

DEMAND CONTINUES (con't)

There is not significant variance from the prior two years in the rate of hiring across the six sectors among the surveyed companies (Figure 7). This is true of key functions as well, with the exception of R&D functions, which are expected to add an additional 445 employees over the next two years (Figure 8).

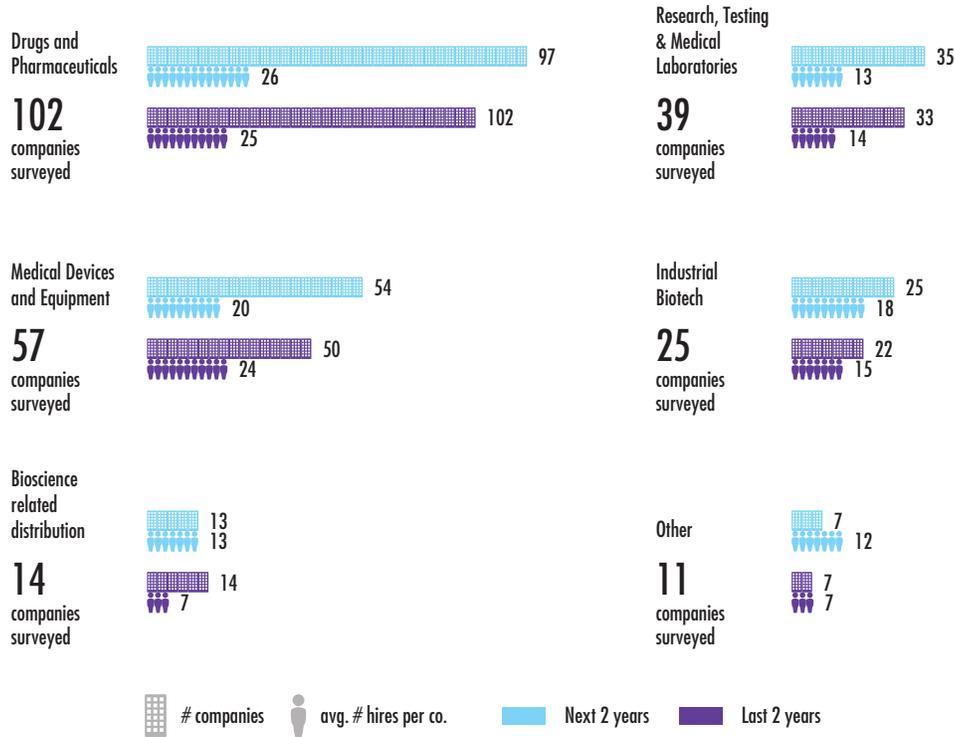


Figure 7 - Average actual and expected hires by sector. (quantitative survey of 248 life science companies in California)

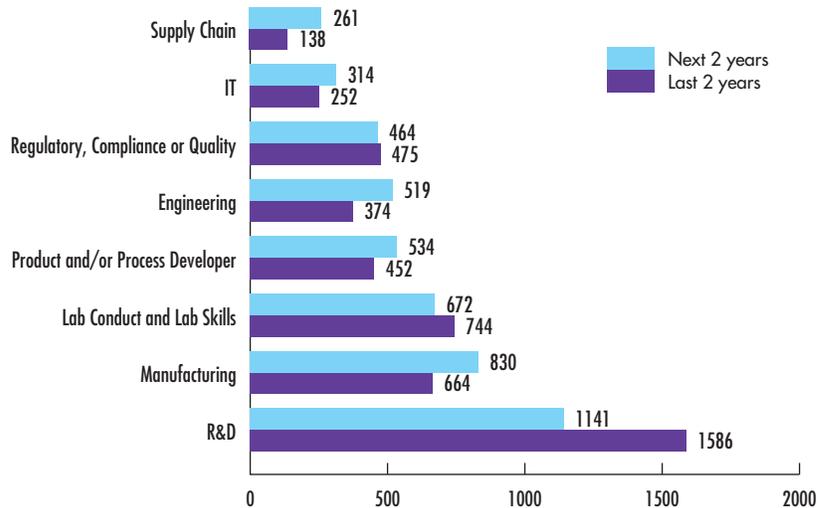


Figure 8 - Aggregate total actual and expected hires by functional area. (quantitative survey of 248 life science companies in California)

TREND 3 - DEPTH AND BREADTH: AN EMPHASIS ON SOFT SKILLS

“As businesses increasingly require employees to collaborate and work across functional areas, the search for or development of improved soft skills for employees in all functional areas is important. Finding the required technical skills in new talent is easier than finding candidates with strong soft skills (e.g., leadership, communication, self-awareness, team-building and empathy).”

“We employ a diverse set of professionals, each representing a different set of skills and functions. It is important that these individuals work collaboratively.”

Life science companies continue to seek talent with relevant training and practical experience in a broad range of technical disciplines. Technology advancements are creating demand for diverse new specializations such as biomarker discovery, precision medicine, innovative clinical study design/execution, data management and economic modeling.

Increasingly life science executives also believe that their companies' success is rooted in hiring and developing talent with “breadth”: people who can solve problems and communicate effectively; people who can collaborate with others and who are proficient at working on cross-functional teams with diverse members; people who can work in environments where there is frequent ambiguity.

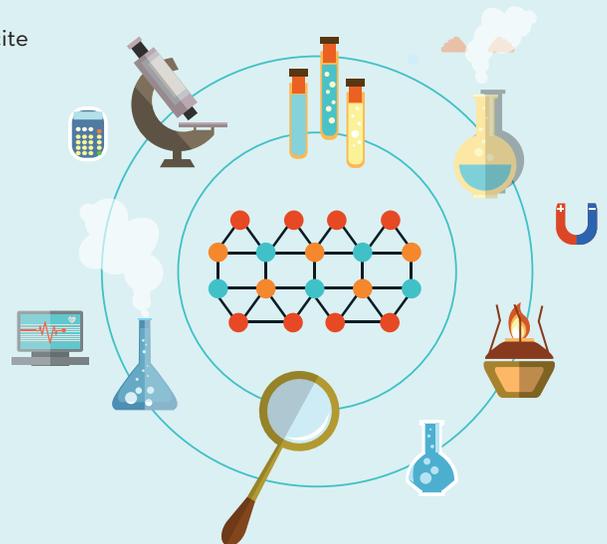
In an industry characterized by significant change and growth, successful employees are able to adapt as their companies and the industry mature and shift. Industry professionals tend to be more transient, and less frequently spend an entire career with a single employer or in a single role with a given employer. Companies put a high value on people who are nimble, flexible, who possess transferable skills and are eager to learn.



The Need for Talent Integration Continues

As with the 2014 California Workforce Trends report, executives continue to cite needs for individuals with cross-disciplinary skills:

“We need more talent that knows how to translate science into developing new drugs. Our challenge is the need for technically expert people in their field who are also able to integrate information from other fields - engineers need to understand biology. Trans-disciplinary training and working within teams of people with different disciplines is essential.”



TREND 4 - DIVERSITY

The diversity issue is complex. On one hand, companies recognize the strong value that employees with diverse backgrounds bring to the work place. Diversity is valued not only for fostering an array of perspectives and approaches that fuel a vibrant organization, but also because it is needed for communicating and partnering with an increasingly diverse and global market. On the other hand, an organization of diverse individuals can be more challenging to build, promote participation in, manage and maintain.

“We strongly believe that diversity brings vast ideas, different approaches and a vibrant culture to solve complex questions. We want our employees to bring their whole selves to the work place and throughout the organization. This allows our employees to perform at their best and gives us the best outcomes.”

“We believe strongly in the idea that diversity (e.g., culture, background, ethnicity, race, gender...) on teams creates the most robust solutions and best decisions. Diversity also is more difficult to manage, so it is important that our employees appreciate and can prosper in an environment of diversity.”

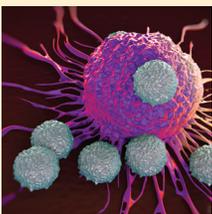
Life science industry executives in California lament the weak pipeline of future talent from groups that are already underrepresented (i.e., African American, Hispanic, and female) in STEM (science, technology, engineering and math) fields. Many recognize that career paths or pathway roadblocks are set at a very early age and that the industry needs to do more to engage these underrepresented populations as early as their elementary school years.

“Today we lose too many students from the STEM education/career pathways as early as elementary school and need to invest in elementary school education, particularly in underserved communities. This is one root cause for why we have lack of diversity in the qualified talent pool for good jobs.”

“As a minority myself, I know first-hand what a lonely path it can be pursuing a STEM career, without role models and a community of support. As an industry, we should make it easier for these students to get excited about math/science careers and maintain that excitement through support and engagement throughout their education.”

SUB-TRENDS

Interviewed executives provided insights into a couple of additional trends that have implications for evolving skill needs:



Immuno-oncology

“While this field has been around for the last 20 years, recent broad recognition of the potential of harnessing the power of the immune system to combat cancer is leading to an explosion of interest in this area.” Skill needs include technical training in both cancer and immune system function and experience in designing immuno-oncology studies.



Green Solutions

“The last decade has brought a trend toward more ‘green’ and sustainability solutions. In past years, green solutions were ‘nice to have’. More recently, customers are demanding green solutions. Multiple new technologies (e.g., CRISP-R, new materials, advances in agriculture and healthcare) are making more and more green solutions economically viable. These now are becoming ‘customer requirements’. As this trend continues, we likely will enter an era where sustainability becomes a regulatory requirement.”

ATTRACTING AND RETAINING TALENT

The life science industry is a strong economic driver and creator of well-paying jobs for many Californians. Despite these advantages, life science companies can struggle to find qualified employees and often note the lack of local candidates who possess the necessary technical or required work experience. Among the recruitment challenges cited is the competition with the tech industry for current and pipeline talent. Some attribute this to the long development timelines associated with the life sciences, which may motivate some job seekers to instead pursue more rapidly developing opportunities in the tech sector. Another challenge highlighted by several executives is the public perception around the industry's contribution to the rising cost of health care.

Life science employers agree that the industry needs to do more to communicate the exciting career pathways available in the sector. Greater efforts also need to be taken to demonstrate the industry's positive impact on human health and other global challenges, such as renewable energy production, environmental health, agricultural productivity and novel biomanufacturing applications.

"Better positioning of our industry is important for recruiting and retaining Millennial and Generation Z talent. These young people require their places of work to be forces of good. If we are viewed as an industry of greed, we lose access to this talent."

Many life science employers also recognize that the key to attracting and retaining the best talent is through developing and providing career growth opportunities for employees. Helping employees define career pathways, design and execute development plans and participate in resume-building activities are viewed as positive ways to increase productivity and reduce turnover by employers who compete for talent.

"I would like to see a coordinated marketing campaign promoting the overall life science industry: why this is such a 'cool industry' to work in and what employees can get out of it. The life science industry here is relatively young. Many people don't understand it. Many students find it daunting, a target they think is out of reach for them. We need to be more creative in our communication channels."

"The most effective thing for private industry to do is to take care of their people, as they are the best spokes[persons] for the company. By engaging our current talent and providing them rewarding career experiences, they build our reputation as an employer of choice."

"By being successful as an organization and developing our people, we not only set standards and role models for others to follow, but we also enable our people to succeed in future roles, whether at our company or elsewhere. It is important to give our employees the opportunities to grow and develop so that they build the skills they need and that we as an organization and industry will need in the future. This culture and approach to our people is a strong recruitment tool."

"As an industry we should do much better at communicating the positive impact we have on human health. The public dialog focuses so much on the cost of health care and less attention is paid to how the life science industry improves the quality of life and extends lives."



ADDRESSING THE TALENT GAP THROUGH INDUSTRY-ACADEMIC COLLABORATION

An ideal employee in a life science company is able to translate complex scientific concepts that are developed in fast-paced multicultural work environment to a wide audience: physicians, patients, policy makers, the general public and other stakeholders. Recent graduates, however, lack the experience of employees who have developed the necessary expertise and soft skills within a company over time. As a consequence, many employers are reluctant to hire individuals fresh out of school.

“We do not hire many entry-level employees, as most people need prior work experience to develop the required soft skills (e.g., team skills, collaboration skills). Recent graduates lack the life experiences to have developed those skills.”

“Even the best of academic candidates have a steep learning curve and take time to adjust to the very different environment of industry.”

A number of companies recognize the need to play a role in developing this industry-relevant knowledge through collaborations with academic institutions at the high school, community college, and university levels. Not only is this seen as important for encouraging more students – including females and underrepresented minorities – to pursue science careers, but students with prior exposure to the work place usually perform better on job interviews and are more successful in industry jobs because they better understand what to expect once they begin a new job. Industry-relevant work-based learning is also viewed by some human resource professionals as a way to leap-frog degree minimums associated with a number of entry-level positions.



Industry leaders commonly point to the potential for strong academic-industry partnerships to close the talent gap and make it easier for their companies to find and retain capable and motivated local employees. Current industry partnerships include participation in industry advisory committees to review curriculum, providing internships and job mentoring programs, offering externships for high school teachers and community college faculty, outsourcing company research projects to students, providing career lectures and company tours, judging and sponsoring local science fairs, to name a few.

A number of life science companies are collaborating with academic programs to prepare their own talent pipelines:



“At the college level we participate in college fairs, recruit graduating college engineering students, host up to five or six student summer internships. Interns work in engineering, marketing or clinical groups on key projects.”

“We want [to hire] people with more than academic lab work... so we host interns to give students experience. [This] also helps us see how well they transition. One-third of our hires come through internship programs with high school students, college students, MBA candidates and post-docs.”

ADDRESSING THE TALENT GAP THROUGH INDUSTRY-ACADEMIC COLLABORATION (con't)

WHAT CAN ACADEMIC INSTITUTIONS DO?

Industry executives often agree that academic institutions do a good job providing technical and functional subject-matter training, but that they could better prepare the talent pipeline in the following ways:

- Provide practical skill development and hands-on experimentation
- Provide students with opportunities to solve complex problems in cross-functional teams involving multiple disciplines
- Connect students to real-world research applications and work experiences, helping them to better understand how corporate organizations work. This could include internships, outsourced company research, and case studies that make the teaching more relevant to industry's needs
- Supplement technical training with training in soft skills: communication, collaboration, team-work and leadership
- Expose and prepare graduate students for high-demand opportunities outside of the lab: regulatory, business development and other commercial functions
- Develop students' understanding of the "business" side of the industry

"In school, a chemistry student might work on a team with a group of fellow chemistry students. That structure does not reflect the real world workplace where a team might have one functional representative from chemistry. The other team members represent diverse functions that may have conflicting objectives, goals and perspectives."

One challenge for school and industry partnerships is finding sustainable and mutually advantageous models for these very different types of organizations to collaborate. They differ greatly in terms of culture, goals, organizational structure, decision-making, communication and available resources. Classroom teachers, especially, are often preoccupied with meeting continuing and new instructional demands, and lack the time and capacity to develop and maintain partnerships with industry in spite of their strong classroom needs.

PHARMA'S NEW R&D: INDUSTRY COLLABORATIONS WITH ACADEMIC RESEARCH INSTITUTIONS

A number of factors have converged to spike industry-academic collaborations at the university level. Biopharmaceutical companies are increasingly looking to externalize research and development by tapping the new discoveries and scientific expertise coming out of academic research institutions. Academic institutions who have historically relied on shrinking government grants now have more incentive to partner with well-resourced and experienced industry partners.

The strong trends towards deepening industry-academic collaborations are not without challenges, including disputes over ownerships of new discoveries and fears of siphoning off best talent. Increasingly, however, partnerships are emerging that allow both organizations to understand their respective cultures and the opportunities available in both academia and industry, particularly since professionals are increasingly moving between these two environments. Collaborations may include collaborative research partnerships, technology licensing agreements, consulting agreements with academic thought leaders, internship programs, and the inclusion of academics on Scientific Advisory Boards to actively engage in scientific discussions and program planning.



ADDRESSING THE TALENT GAP THROUGH INDUSTRY-ACADEMIC COLLABORATION (con't)

WHAT CAN INDUSTRY ASSOCIATIONS DO?

As supporters of the life science industry, industry associations are well positioned to encourage these industry-academic collaborations in the following ways:

- Raise awareness among industry of the need and ROI for partnering with academic institutions at multiple levels
- Recognize quality high school, (community) college and university programs that are developing industry talent
- Share best practices and help match companies to quality academic programs
- Recognize companies that are engaged in innovative partnerships with academia to inspire and develop talent
- Help smaller under-resourced companies “piggy-back” on larger company collaborations with schools and (community) colleges

“Industry can raise awareness of what industry is about, helping students envision themselves as future employees”

“More HR professionals in particular need to be out in the community, at schools and at job fairs helping educate students and young adults on how to prepare for the job market.”



WHAT CAN INDUSTRY DO?

Industry partnerships with academia at all levels are vital for developing collaborative research and preparing and inspiring new generations of talent with industry-relevant knowledge.

THE INDUSTRY CAN:

Build enthusiasm for STEM among students by becoming actively engaged in collaborations with K-12 schools, (community) colleges and universities

- Reach out to peer companies and/or industry associations for help in developing meaningful and rewarding partnerships
- Define the process for building such academic partnerships, while taking time the time to listen and understand the academic partners’ needs, constraints and concerns
- Provide real-world, practical opportunities for students to develop industry-relevant knowledge: career talks, informational interviews, internships, company tours, outsourced research, etc.
- Identify opportunities for students and allocate time in company environments to better prepare them for future employment

Demystify and promote the industry by highlighting its vast and diverse career opportunities

- Work with schools and (community) colleges to demonstrate the industry’s positive impact on human health and other global challenges, delineating the diverse career pathways that are addressing those challenges
- Share a five - ten-year view of where future job opportunities will be and what skills/training will be needed for those jobs
- Advise on curriculum development
- Work with high schools and (community) colleges to train college career counselors on the range of career choices in the life sciences

The life science industry is a continuing vital contributor to the economic prosperity of California, offering well-paying positions and continued career growth for hundreds of thousands of state residents. The industry is also helping the state maintain its leadership role in innovation by generating breakthrough solutions to address critical challenges in health care, industrial manufacturing, agriculture, environmental health, and material sciences. By participating in an ongoing dialogue with industry to understand its evolving talent needs, and by facilitating meaningful partnerships with academia to develop that talent, California stakeholders can build the talent needed to drive breakthrough discoveries into the coming decade.

THANK YOU TO ALL THE LIFE SCIENCE
COMPANY AND ORGANIZATIONS THAT
PARTICIPATED IN THE ANALYSIS,
INCLUDING THE FOLLOWING 34 COMPANIES THAT
PROVIDED IN-DEPTH INTERVIEWS:

AbbVie

Agility Clinical

Amgen

Amyris

Ansun Biopharma

Arcus Biosciences

Ardelyx

Bayer

CareDx

Celgene

Codexis

Conatus Pharmaceuticals

Crinetics

CymaBay

Cytokinetics

CytomX Therapeutics

Genencor

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California Life Sciences Institute (CLSI) supports the foundations of innovation that have made California home to the world's most prominent life sciences ecosystem. With a focus on the San Francisco Bay Area, CLSI's mission is to maintain California's leadership in life sciences innovation through support of entrepreneurship, education and career development. CLSI is an affiliate of the California Life Sciences Association (CLSA), the leading voice for California's life sciences sector, which represents more than 750 life sciences organizations. The California Life Sciences Institute is a non-profit 501(c)(3), and was established in 1990 as the BayBio Institute. Learn more at www.califesciencesinstitute.org.



Biocom Institute provides a tremendous array of programs to accelerate the growth of the life sciences ecosystem through workforce development and STEM education programs. Our industry-leading initiatives drive success for professionals eager to expand and enrich their skill set. Our world-class Science and Engineering Festival inspires today's students to become future leaders. With a goal to invigorate the student community of southern California to embrace a career in STEM, and attract the best and brightest talent for long-term careers in life science, the Biocom Institute is a driving force in shaping the Science of Life. The Biocom Institute is an affiliate of Biocom, the largest and most experienced advocate for California's life science sector. www.biocominstitute.org and [@BiocomInstitute](https://twitter.com/BiocomInstitute)

DATA TEAM



Centers of Excellence support the community colleges by providing customized data on high growth, emerging, and economically-critical industries and occupations and their related workforce needs. These seven Centers, located strategically to study the regional economies of California, produce industry-validated environmental scan reports designed to enable community colleges to remain relevant and responsive in their offerings. www.coecc.net



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CMTC focuses exclusively on small and medium-sized manufacturers (SMMs) to help grow jobs, increase technology adoption, improve investments, and enhance workforce skills. Our mission is to provide SMMs with solutions that will grow their businesses profitably.



The Coalition of State Bioscience Institutes (CSBI), formed in 2012, is comprised of 42 state bioscience organizations and the Biotechnology Institute whose goal is to ensure America's leadership in bioscience innovation by delivering industry-led life science education, workforce development, and entrepreneurship programs through a nationally coordinated effort. www.csbinstitutes.org



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