

2014

The Coalition of State
Bioscience Institutes (CSBI)
***Life Sciences
Workforce Trends
Report 2014***



CSBI

COALITION OF STATE
BIOSCIENCE INSTITUTES

The Life Sciences sector represents one of the most important technology industries of the 21st Century. It is the only industry that can lay claim to providing breakthrough products and technologies to combat debilitating diseases, reduce our environmental footprint and feed the hungry while having a positive impact on the economy.

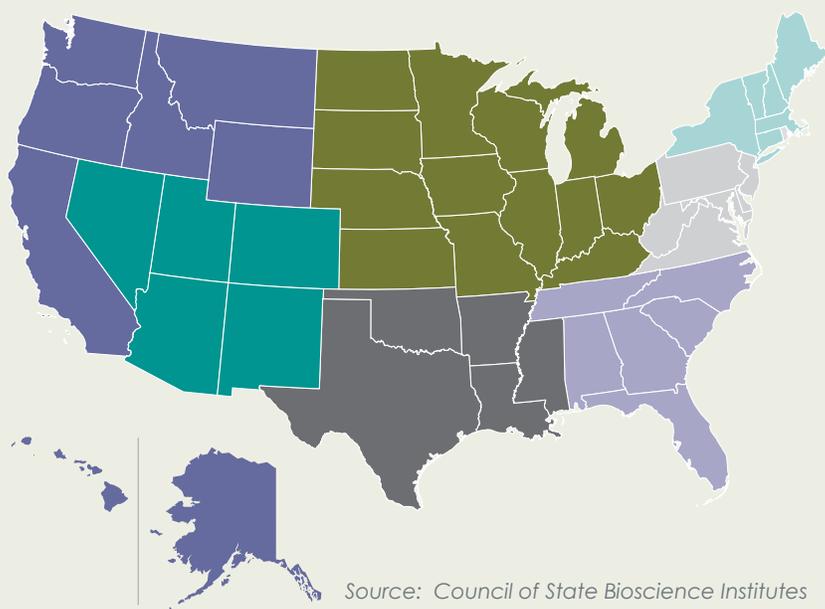
After four-and-a-half years of financial challenges – fluctuating IPO markets, financial constraints in venture and NIH funding, and continued mergers and acquisitions – the biotech market is once again flourishing. National employment in the U.S. life sciences industry totaled 1.62 million in 2012, with these jobs spanning over 73,000 companies¹. Continued FDA approvals, new IPOs, and expanding global markets are requiring companies to fill entry-level to highly advanced positions with qualified skilled individuals. Moreover, despite year to

year volatility, the overall trend in the industry has been growth, necessitating continued preparation of talent to meet the needs of a growing, innovative life sciences industry.

The CSBI Life Sciences Workforce Trends Report highlights the demand for the most critical talent, training, and skill needs of the industry and helps inform the actions that key stakeholders should take to ensure that we are preparing a talent pipeline with competencies and insights that will drive a competitive advantage within the United States.

¹ Battelle/BIO Bioscience Industry Report 2014

Figure 1
Regions



Source: Council of State Bioscience Institutes

- REGION 1**
Alaska
California
Hawaii
Idaho
Montana
Oregon
Washington
Wyoming
- REGION 2**
Arizona
Colorado
Nevada
New Mexico
Utah
- REGION 3**
Arkansas
Louisiana
Mississippi
Oklahoma
Texas
- REGION 4**
Illinois
Indiana
Iowa
Kentucky
Kansas
Michigan
Missouri
Minnesota
Nebraska
North Dakota
Ohio
South Dakota
Wisconsin
- REGION 5**
Alabama
Florida
Georgia
North Carolina
Puerto Rico
South Carolina
Tennessee
- REGION 6**
Delaware
Maryland
New Jersey
Pennsylvania
Virginia
West Virginia
- REGION 7**
Connecticut
Maine
Massachusetts
New Hampshire
New York
Rhode Island
Vermont

Methodology

To develop a national snapshot of the current and projected talent needs in the life sciences industry, the Coalition of State Bioscience Institutes (CSBI) conducted a series of interviews with executives and strategic leaders in more than 100 life sciences companies within the U.S. The companies interviewed spanned the five major subsectors of the bioscience industry as defined by BIO²:

- Agriculture Feedstock & Chemicals
- Drugs & Pharmaceuticals
- Medical Devices & Equipment
- Research Testing & Medical Laboratories
- Bioscience-related Distribution

The interviews (January 1 to March 31, 2014) addressed current and future business priorities/capabilities and their implications for workforce and training needs. The qualitative interviews and analysis were conducted in parallel with a quantitative analysis using Burning Glass, a proprietary platform that aggregates, extracts, codes and normalizes nationwide job posting data from more than 23,000 job boards, newspapers, employers and other websites.

² Battelle/BIO State Bioscience Industry Development 2012

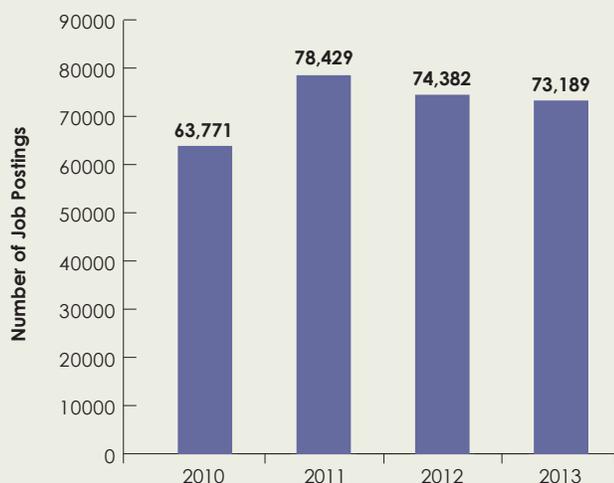
Findings

Growth

Qualitative and quantitative data support the fact that the life sciences industry continues to experience demand at all levels, with a strong need for knowledge-based employees. Job postings in the life sciences industry remained at historic highs with over 73,000 positions posted last year, a 15% increase over 2010 (Figures 2 and 3).

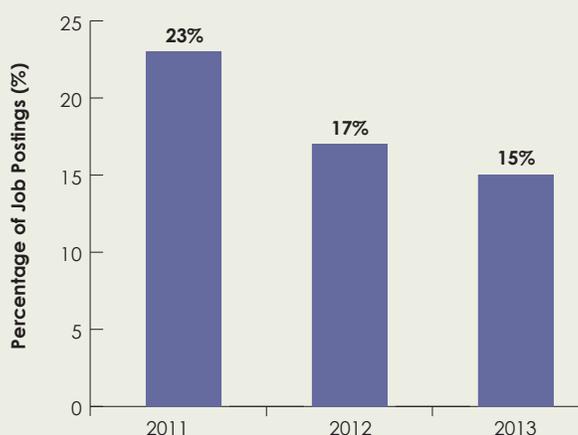
According to national job board postings, the greatest demand could be found in the Region 1 (25%), followed by the Region 4 (20%), both Regions 6 and 7 (15-16%), Region 5 (11%), Region 3 (7%), and Region 2 (6%).

Figure 2
Historic Number of Job Postings 2010-2013



Source: Burning Glass Technologies

Figure 3
Percent of Job Posting Increase Since 2010



Source: Burning Glass Technologies

Several themes emerged among hiring managers and industry leaders from all sectors who participated in the interviews, including the need for:

- Individuals with strong science skills combined with multidisciplinary academic training and experience
- Regulatory professionals who can help bridge the gap between regulatory functions and business activities
- Scientists, engineers and clinicians who possess cross-functional skills that promote strong communication and the ability to interface well with both internal and external partners
- People with policy acumen who can help navigate health economics and the Affordable Care Act as well as influence legislators
- Strong and informed partnerships between academia and industry to provide tailored and relevant training to effectively meet industry needs

Professional Hybrids

The qualitative analysis indicates that the skills needed today and in the near future still require a strong STEM (Science, Technology, Engineering, and Math) background, yet also an evolving need for their use in combination with other disciplines. Traditionally, the approach to development within the life sciences industry has leaned heavily on individuals trained in disciplines such as chemistry and biology. However, data from the qualitative interviews reveal that simply having a basic science degree is no longer enough to be successful. The findings suggest that there is an absolute need for “*professional hybrids*” - individuals who have the skill sets necessary to link scientific knowledge with business acumen to advance a product or technology through its life cycle.

Figure 4
Distribution of Job Postings by Region in 2013

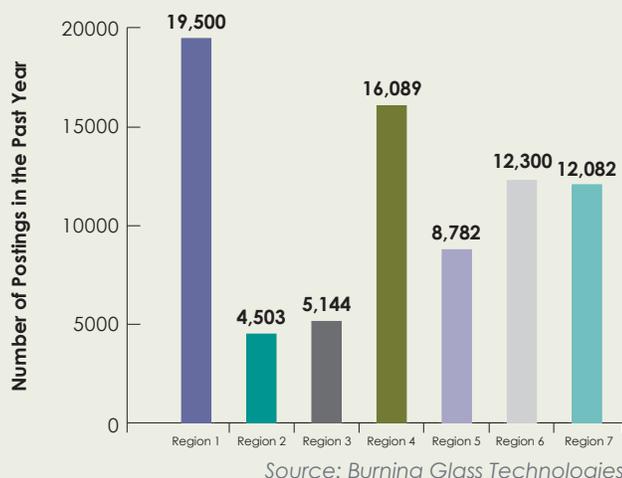
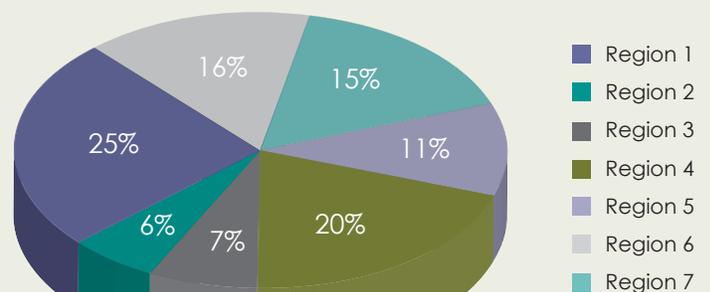


Figure 5
Percent of Job Postings by Region



Source: Burning Glass Technologies

Quotes from Interviews

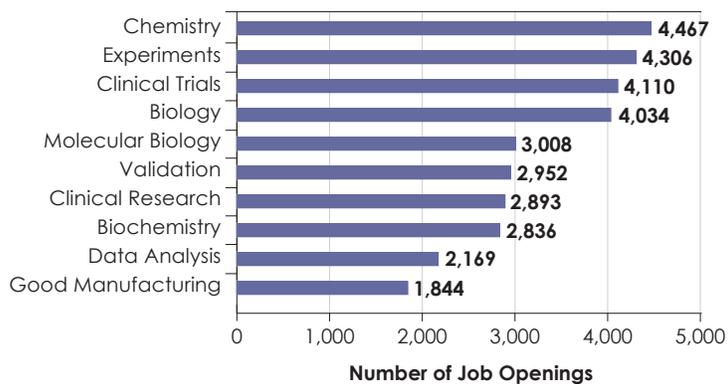
"The capability to take a project and integrate business, science and computer skills together to provide solutions is critical."

"Biology graduates [who lack] the capacity to integrate business and science is the biggest challenge."

"We need engineers with a better understanding of the basic sciences like chemistry and biology."

"We need people with skills in complementary disciplines."

Figure 6
Skills Most Frequently Listed in Job Openings Nationwide



Source: Burning Glass Technologies

Burning Glass Technologies. Qualitative interviews supported this, but also revealed the need for a hybrid of skills.

Regulatory Knowledge

In recent years, the regulatory landscape has shifted dramatically, resulting in a demand to understand current regulatory policies both within and outside of the U.S. Company leaders and hiring managers emphasized the need for employees who possess a stronger understanding of industry-specific ways of working, such as compliance with FDA regulations, as well as with quality assurance in product development and regulations.

The qualitative interviews revealed an anticipated need for regulatory professionals across subsectors who can provide strategic direction at all stages of development. Interviewees also expressed the need for continuous training programs to keep pace with the changing regulatory environment as well as the importance of knowledge related to regulatory policies in other countries.

Quotes from Interviews

"We need people who have much more experience on the regulatory side, who can represent the interface of science and technology, influence regulators and successfully defend our marketing applications."

"Having an understanding of regulatory processes outside of the FDA and EMA is crucial."

"Regulatory and quality practices will be key both in the R&D phase, across manufacturing and in customer-facing activities."



Cross-Functional Skills

The ability to work across functions emerged as a dominant theme in the interviews. Specifically, the ability to work in teams and in multiple areas simultaneously is highly sought after, representing a shift away from senior scientist positions that tend to be more highly specialized and narrowly focused. In addition, strong communication and interpersonal skills, time management, professionalism, problem-solving abilities, leadership and agility to manage change are increasingly cited as important for scientists, engineers, clinicians and management teams who work within the industry.



Quotes from Interviews

"We look for employees who have learned through experience, who have been part of multi-disciplinary teams and recognize both the team accomplishment and their role in the team."

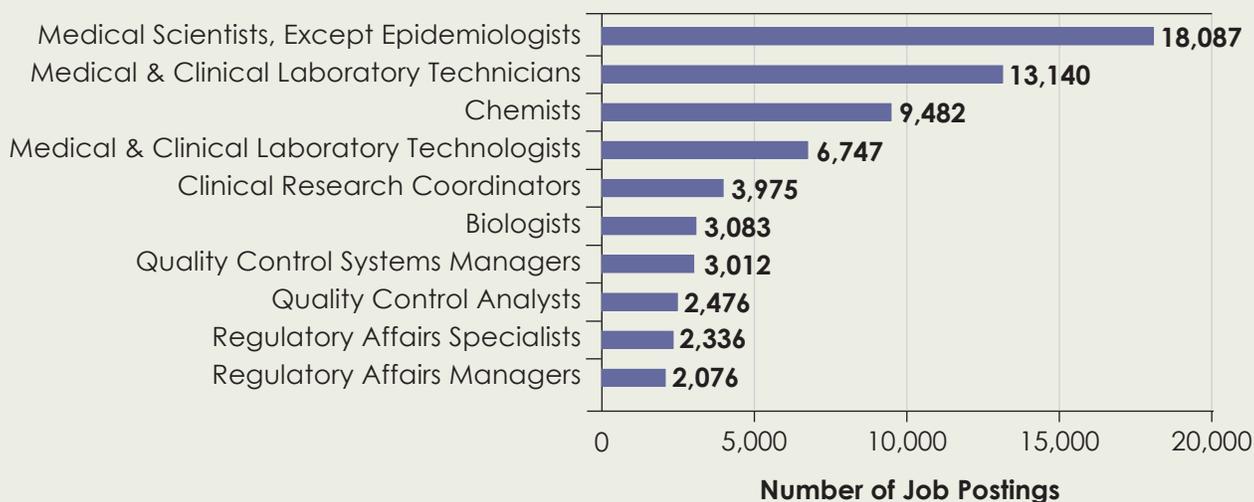
"Individuals with capabilities in communication, leadership, problem-solving and innovative thinking are fundamental to successful company growth."

"Potential employees need to have the capability to effectively work on a team and have excellent communication skills, especially written."

"Ph.D.s coming straight from a university can be very narrowly focused and have a hard time out-focusing."

"Employees need to be flexible when working across disciplines, as they will often find themselves working in different areas within the company."

Figure 7
Top 10 National Life Sciences Occupations



Of the top 10 national life sciences occupations, note that 4 involve regulatory and quality practices.

Source: Burning Glass Technologies

Policy Acumen

Several interviewees referenced the importance of understanding health economics, reimbursement and the impact of the Affordable Care Act on the life sciences industry. Government affairs, particularly the need to educate and build relationships with legislators both locally and nationally to support industry growth, was also viewed as an important skill set.

Quotes from Interviews

"The changing world of healthcare requires enhanced focus on pharmacoeconomics, government affairs, market access and supply chain systems."

"An understanding of the Affordable Care Act, Medicare/Medicaid billing practices and reimbursement are very important."

"As reimbursement continues to evolve as an important issue, we need people who are informed regarding new regulations."

"We need to continue work at the state capital to ensure and secure future funding in an effort to continue building the necessary policy and infrastructure to create a conducive ecosystem."

Academic/Industry Partnerships

The need for collaborative partnerships between the industry and academic institutions was strongly emphasized across the subsectors. This included a particular emphasis on new approaches that incorporate experiential learning models or a learn-by-doing approach, as in internships with biotechnology companies.

Interviewees also expressed concerns over lag-times in getting new hires up-to-speed, citing their inability to understand the business aspects of the company environment. Many of them indicated the importance of working with academic institutions to build curricula that are industry-relevant and -applicable, producing graduates prepared for direct entry into the workforce.

Quotes from Interviews

"University knowledge extends the capacity of private companies, while private companies offer a place for students to get real-world experience and in some cases, to establish a career."

"We should expand hands-on training for university students so they have a blend of classroom/ experiential work and industry work."

"We need academic institutions to create programs and educational tracks to produce the necessary talent that life science companies require."

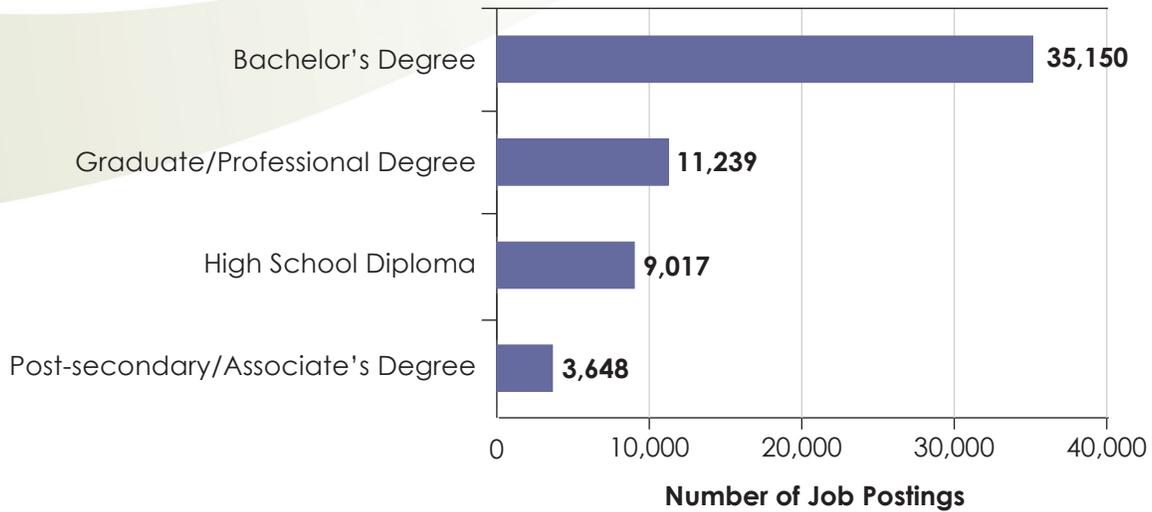
"Make work experience a required part of the curriculum."

"Academic institutions need to function like a business and to teach results orientation versus a learning-only orientation."



Figure 8

National Education Requirements Based on Number of Job Openings

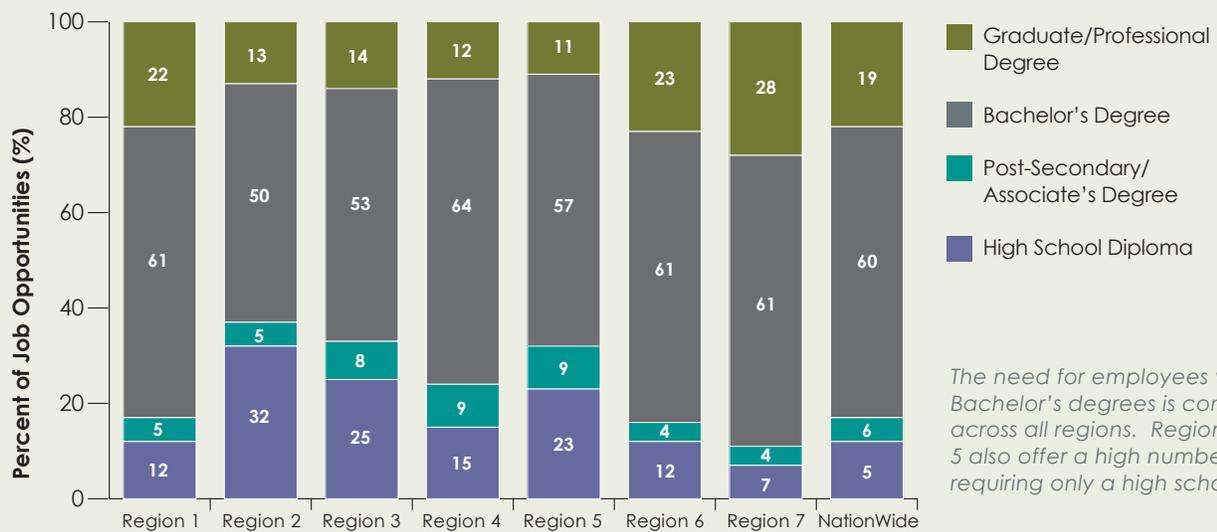


Most of the positions posted in 2013 required the minimum of a Bachelor's degree (60%), followed by Graduate/Professional degrees (19%), High School Diplomas (15%), and Post-secondary/Associate's Degrees (6%).

Source: Burning Glass Technologies

Figure 9

Regional and National Education Differences: Percentage of Job Opportunities



The need for employees with Bachelor's degrees is consistent across all regions. Regions 2, 3 and 5 also offer a high number of jobs requiring only a high school diploma.

Source: Burning Glass Technologies

Recommendations

Data collected from this study point to the need for academia and industry to join forces and provide unique partnerships that will ensure that current and future workforce demands within the life sciences are adequately met.

Call to Action – Meeting Future Workforce Demands through Stronger, more Innovative Industry-Academic Partnerships

- Provide new interdisciplinary approaches to learning: uniquely designed curricula that integrate STEM with other disciplines, and that provide the business acumen and regulatory knowledge necessary for commercializing science.
- “Educate the educators” about industry needs: develop industry advisory boards to ensure that communication is flowing in both directions so that program curricula are providing the most relevant industry knowledge and skills while remaining aligned with current and future technologies.
- Create experiential learning opportunities where students learn by doing: companies offer “real life” projects that provide tailored benefits for students and no-/low-cost research and/or products for industry.
- Design courses where students must work in teams and across institutions (community colleges and universities) and other disciplines, such as engineering and business, with a goal of disrupting traditional silos, thus facilitating the completion of real-world life science projects for research institutions and regional companies.
- Create corporate post-doctoral training programs that address relevant skills and business acumen to better prepare post-docs for careers outside of academia.
- Industry and academia must work in concert to inform legislators on the importance of providing funding and other incentives for academic and industry partnerships that will develop the critical talent needs for the industry.



Summary

As the life sciences industry continues to grow, it must also strive to meet challenges in funding strategies, regulatory environments, changing healthcare policies, business models, partnerships and strategic alliances. As a result, the industry demands a talent pool with a strong knowledge base, possessing all of the components necessary to translate scientific discovery effectively and efficiently into commercial products. This report points to a clear shift in the industry's demand for talent away from senior scientist positions that tend to be more highly specialized and narrowly focused, to a talent pool consisting of individuals who have interdisciplinary academic training and the ability to work broadly in project teams across multiple areas.



ABOUT CSBI

Founded in June 2012, the Coalition of State Bioscience Institutes (CSBI) is a national coalition of 42 state bioscience organizations and the Biotechnology Institute that are working to ensure America's leadership in bioscience innovation by delivering industry-led life sciences education, workforce development, and entrepreneurship programs through a nationally coordinated effort.

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