An interdisciplinary shift in demand for talent within the biotech industry

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A shift away from hiring narrowly focused specialists to individuals with interdisciplinary academic training highlights the latest life sciences workforce trends.

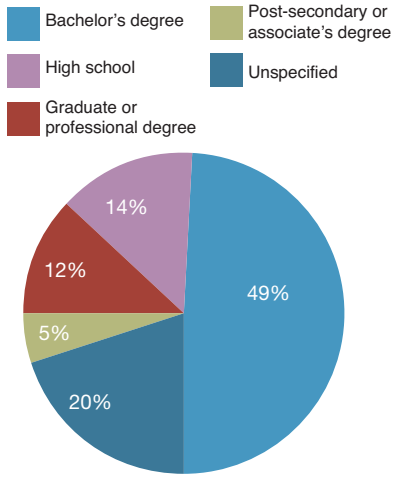
National employment in the US life sciences industry totaled 1.61 million in 2010, with these jobs spanning over 70,000 individual companies[1]. In fact, over the past decade the life sciences industry has consistently outpaced the overall national private sector, adding new jobs at nearly twice the rate. This is not to say that this sector has been immune to the global recession. Indeed, the industry has faced a host of challenges—with funding at the top of the list—that have forced a change in business models, partnerships and strategic alliances, the capabilities deployed in R&D, and the relationship with customers, particularly large payers such as health insurers. As the industry strives to meet these challenges while continuing to grow, it demands a talent pool with a strong knowledge base, with all of the components necessary to translate scientific discovery effectively and efficiently into commercial products. Two of the most pressing questions for our industry today are, "Where are the jobs?" and "Where are the jobs going to be?"

A strong and evolving need for talent

To address these questions and to begin to develop a national snapshot of the current and projected talent needs in the life sciences industry, the Coalition of State Bioscience Institutes (CSBI), in collaboration with Booz & Company, conducted a series of interviews with 26 strategic industry leaders—including CEOs, heads of R&D, commercial development, human resources and manufacturing—from March to May 2013. These interviews were conducted in parallel with quantitative analysis using Burning Glass, a proprietary platform that aggregates, extracts, codes and normalizes job data from more than 23,000 job boards, newspapers, employers and other websites.

The introductory analysis generated from these interviews begins to articulate the demand for the most critical talent, training, and skill needs of the life sciences industry today and is intended to enlist additional broad-scale industry participation in an annual in-depth report. Furthermore, information generated from this analysis and future reports will help to inform the actions that key stakeholders should take to ensure that we are preparing the talent pipeline to meet industry demands in the coming years.

The qualitative interviews supported the fact that the life sciences industry is continuing to experience job growth with an evolving and strong need for knowledge workers. The need for knowledge workers was highlighted in four distinct ways, consistent with quantitative analysis of the Burning Glass national jobs data. (i) There is a substantial need for employees with baccalaureate and advanced degrees (**Fig. 1**); but (ii) there is a significant need for high school-only graduates who can receive industry-specific training from their employers; (iii) there is continued demand for candidates with industry-based work experience and industry-specific job skills in disciplines ranging from clinical, validation and biochemical analysis, to regulatory and quality systems (**Fig. 2**); and (iv) candidates with advanced or specialized degrees, such as biostatisticians with the ability to address needs in bioinformatics and computational biology, as well as engineers with the ability to manage complex biological process scale-up, are in exceptional demand (**Fig. 3**).



Degree	Total
Bachelor's degree	31,910
High school	9,104
Graduate or professional degree	7,501
Post-secondary or associate's degree	3,175
Unspecified	12,644

Figure 1 Degree required (% of US life sciences job posting).

Interviews of hiring managers and industry leaders indicated that they profiled their workforce-related capability needs into three categories, including: (i) didactic skills and baccalaureate and post-baccalaureate training in life sciences disciplines, such as chemistry and biology; (ii) orientation towards the life sciences industry, with a clear understanding of industry-specific ways of

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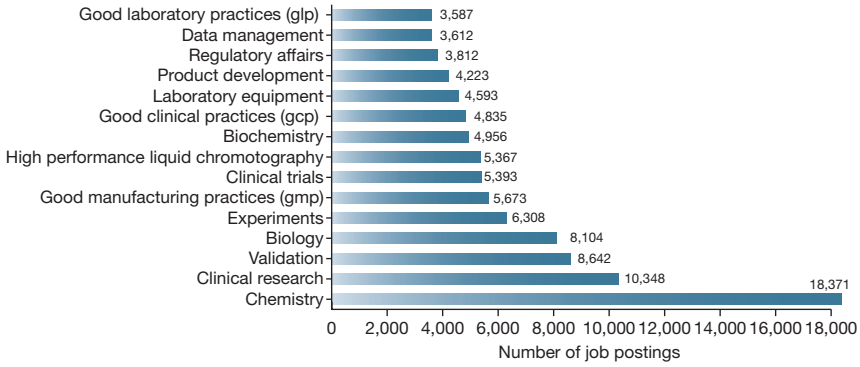

Figure 2 Life sciences skills most frequently listed (in 64,334 job postings).

working, such as compliance with US Food and Drug Administration regulations, six-sigma and zero-defect quality systems and assurance in product development and manufacturing, and the design and execution of rigorous clinical studies; and (iii) soft skills and the ability to work effectively across disciplines.

Hiring and workforce deployment trends were consistent across company sizes ranging from small (less than 25 employees) to large (over 1,000), but there was a surprising anecdotal finding that was supported across the interview set. Whereas historically, large companies have tended to invest in workforce training, and small companies have sought employees who were sufficiently trained to 'hit the ground running', the lean human capacity models practiced by large global pharmaceutical companies have resulted in a reluctance to hire untrained individuals by companies of all sizes. This puts pressure on policy makers to ensure that targeted workforce training resources are available to train job seekers who are entering or re-entering the life science jobs market.

The introductory analysis highlights a common theme addressed by all interviewees and points to a clear shift in the industry's demand for talent away from the 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 with the ability to work broadly across multiple areas and in project teams where not everyone has to be an expert in everything. Specific skill sets desired among scientists, engineers, clinicians and management teams who work within the industry include strong communications skills that facilitate the translation of the science effectively to stakeholders, a commercial market-based mindset versus an academic mindset, the ability to apply skills to real world problems, comfort with big data management, the capacity to be creative and the willingness to push boundaries.

Hiring managers and industry leaders made little mention of gender differences or preferences in the interviews. When prompted, managers referred to studies that show that gender-based skill-enhancement and employment differences in the life sciences have been narrowing, such as, for example, US graduation statistics for pharmacists that show that more female than male pharmacists have been graduating and entering the workforce for well over a decade.

Meeting future workforce demands

At this stage in the study there are several emerging propositions to ensure that current and future workforce demands within the life sciences are adequately met. The first is to further develop and increase the scope of public-private and industry-academic internships, cooperative fellowships, and training programs to enable students to gain exposure to industry-specific needs. Academic institutions must provide new and interdisciplinary approaches to learning that move away from traditional classroom and lecture formats as the primary source for transmitting knowledge. New approaches that incorporate experiential learning models or a learn-by-doing approach, as in internships with life sciences companies, provide unique and tailored benefits to students while helping the company grow. Academic programs should

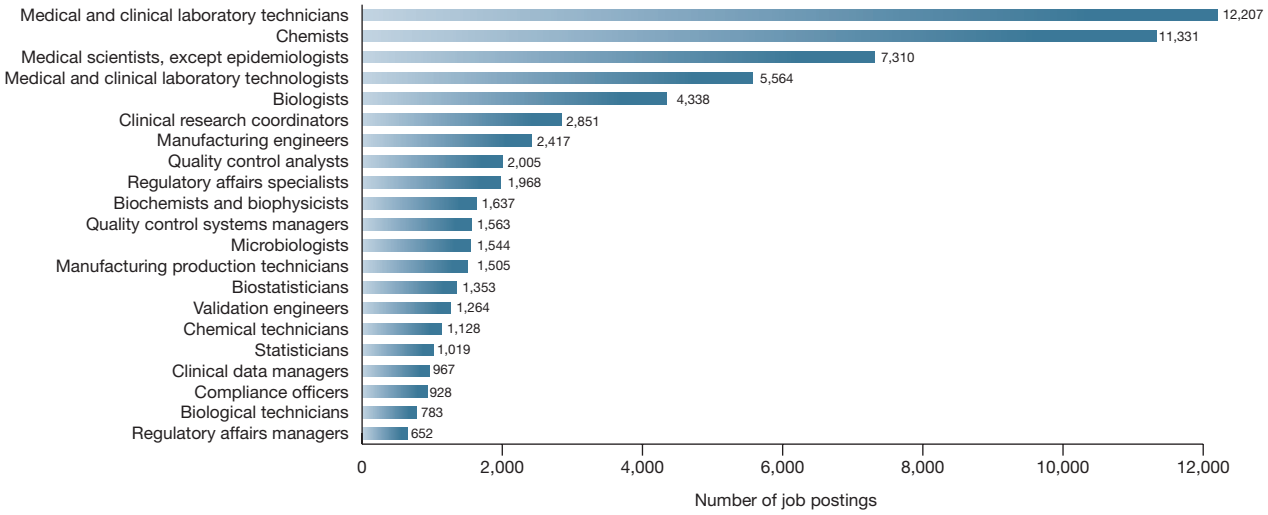

Figure 3 US life sciences job postings, February 2012 to February 2013. Shown are the top 21 posted occupations for 64,334 US life sciences job postings. Although it is not surprising that jobs with general and broad descriptions such as lab technicians and chemists had high scores, it was surprising that specialized job postings such as biostatisticians and validation engineers also scored high.

be designed to provide a more direct route to a career in biotech by focusing on mastering current techniques coupled with the business fundamentals necessary for successful product/technology development in the industry. The goal should be to broaden and expand students' knowledge base, thus making them particularly useful to potential employers. Both academia and industry must also work to increase awareness of the broad range of career paths in the life sciences to help prevent a shortage of qualified talent.

The second proposition is to build a national life science certification program that includes deep dives into topics such as regulations, clinical trial design and process validation. This type of program will be useful for the training and certification of students who are starting life science careers, and for retraining those who want to make a career change.

A third proposition focuses on the need to recognize the global nature of the industry and the need for strong cross-cultural fertilization and job mobility across national borders. Structured and unstructured programs should be developed and implemented that increase opportunities for interaction among functional and subject matter experts across regions and countries. These kinds of initiatives will also help to communicate best practices across regions and borders.

In the next phase of the analysis, currently underway, the emerging themes discussed here will be further explored, tested and developed. The CSBI is committed to a continuing dialog with the life science industry to ensure the proper development of the talent needed to support ongoing innovation in the life sciences. By leading an in-depth, annual study of talent demand, the CSBI can bridge industry, academic institutions and workforce training initiatives. This national study will be a key tool in the life science industry's work with legislators, economic development strategists, academic institutions and other key stakeholders.

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COMPETING FINANCIAL INTERESTS

The authors declare no competing financial interests.

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