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Career Advice

Wanted: B.S. and M.S. Scientists in Life Sciences Industries

By Alaina G. Levine
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You don't have to have a Ph.D. to be a researcher in the life sciences sectors these days. In fact, not only do professionals with Master's and Bachelor's degrees find challenging scientific opportunities in companies large and small, but they also are often considered to be strategically important to industry growth: As corporations expand beyond their basic research and development foundations, there is a greater need for M.S.- and B.S.-level researchers who can plan experiments, conduct investigations, and lead teams in crucial areas such as operations, quality assurance, and engineering. And as technology improves and automa-

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tion becomes more readily available, job tasks previously only executed by Doctorates are becoming the domain of those with Master's and sometimes Bachelor's degrees. Even in this difficult economy, sectors such as big pharma, biotech, and agribusiness are courting and cultivating B.S.- and M.S.-level talent, for both full-time and contract positions, as part of their strategic plan for advancement.

While it may have once been true that only Doctorates were charged with conducting scientific experiments or holding science-driven positions in the life sciences industry, new career pathways have been opening for B.S./M.S. scientists throughout the sector. At Human Genome Sciences (HGS), a 19-year-old pharmaceutical company based in Rockville, Maryland, the opportunities are clear: "You don't have to be a Ph.D. to be a scientist," says **Kunal Chadha**, associate director of strategic staffing. And here's more good news about advancing in this firm with 1,200 employees—"there's no ceiling" in terms of how far a scientist can go, with or without a Ph.D., he adds.

This is great news for the over 101,000 B.S. graduates and 14,000 M.S. graduates annually in life sciences and agriculture, according to 2008 data from the National Science Foundation and the U.S. Department of Education/National Center for Education Statistics. Opportunities are available across the spectrum of life sciences companies, from multinational, decades-old corporations to mom-and-pop startups. Sectors such as medical devices, petrochemical, environmental, nutraceutical, diagnostics,



Kunal Chadha

clean technology, biotechnology, industrial biotechnology, and even food and beverage require scientists with Bachelor's and Master's degrees, says **Alan Edwards**, vice president and science product leader for Kelly Services. Positions include molecular and cellular biologists, protein chemists, clinical auditors, food scientists, sensory panelists, and biostatisticians. There are also appointments in metabolomics, proteomics, and genomics, he notes.

In fact in many cases, because of automation, growth within enterprises, and other factors, "what was once done by Ph.D.s can easily be done by Master's- and Bachelor's-degreed scientists," says Edwards, including tasks such as gene expression and polymerase chain reaction (PCR) techniques.

One professional arena that is growing considerably is in contract research organizations (CROs) and contract manufacturing organizations (CMOs). "CROs and CMOs tend to hire more B.S.- and M.S.-level scientists versus Ph.D.s," says **Peter Ferguson**, regional senior vice president of the health and life sciences division of Yoh, a recruiting and

contracting firm. Years ago these types of companies, which perform vital functions for pharmaceutical and biotech companies, were not as large or prevalent as they are now, but today, "big pharma has made a conscious shift to outsourcing a majority of drug development tasks and manufacturing activities to these third-party organizations," he explains. "In some cases, there is a complete asset shift as companies not only outsource the work, but actually transfer their employees and ownership of their facilities to the partner CROs and CMOs." Combine that with a conservative attitude towards hiring in the pharmaceutical companies themselves and one finds additional opportunities for scientific positions in their partner organizations, he says.

GAINING A COMPETITIVE EDGE

Sometimes having a special skill can boost a Bachelor's- or Master's-level scientist's job prospects.

Loredana Serafini, a senior research associate at Gilead Sciences in Foster City, California, received both a Bachelor's and a Master's in biology from California Polytechnic State University (CalPoly), San Luis Obispo. Her thesis delved into proteomics and cell physiology, but that wasn't exactly what helped her land her scientifically rigorous job at this small biotech company in the Bay Area—it was the fact that she spent her time at CalPoly laboring in the environmental proteomics laboratory of Dr. Lars Tomanek, where she learned how to use a mass spectrometer. At Gilead, her main responsibility is to run the mass spectrometers for the biochemistry group. Using the delicate instrument she ensures the accuracy of the weight of molecules and proteins that are used in the drug discovery and manufacturing processes, and identifies any modifications or impurities that may be present.

Is it intellectually stimulating for her? "Almost overwhelmingly so!" says Serafini, who has been in the job since March 2011. She works with scientists to design the experiments that run on the mass spec, analyzes the results, and interprets the data to determine whether proteins have been modified or degraded. The assignments are so technical that it is rare to have someone in the job with just a Master's. "Most people in this job have industry experience . . . and usually people with Ph.D.s work with mass specs." Her advisor echoes this sentiment: "I was a Ph.D. at UC Davis and they barely let me use the instrument," admits Tomanek. But because Serafini had so much experience on the apparatus as a student, she gained a competitive edge.

Tomanek notes that his students are "getting jobs easily, which is surprising in this economy." Of the eight Master's students he has supervised in the last six years, five have top jobs in industry, mostly in scientific management roles in mass spec facilities. As more companies rely on mass specs to provide crucial data for quality control as well as proteomics and metabolomics investigations, "you're going to see more mass spec needs in industry," he asserts. "This is the next frontier of understanding proteomics data sets, and the mass spec is the key to that." Specialized programs, like that at CalPoly, which give students real-world experience on various types instruments, enable graduates to secure employment without a Doctorate.



Credit: Photo courtesy of Kelly Services, Inc.

Alan Edwards



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Loredana Serafini (right) and her advisor, Lars Tomanek.

B.S. AND M.S. SCIENTISTS: STRATEGICALLY VITAL

For many leaders in life sciences, the role of B.S. and M.S. scientists cannot be overstated—they are regarded as vital to the growth and advancement of companies and whole sectors. At Monsanto, a 20,000 employee, multinational corporation, Bachelor's and Master's scientists are of "strategic importance," says **Melissa Harper**, vice president of global talent acquisition and diversity. "They are very critical—not just for our business, but for our industry. They fulfill needs for which a Ph.D. is not necessarily required. At Monsanto, this could include tasks found within our research associate and research assistant roles, including experimental design and implementation, data analysis, and coordination of other support activities."

Whereas Doctorates fill fundamental research and development positions, Bachelor's- and Master's-degreed scientists are needed elsewhere, especially in manufacturing and operations. And for young companies that are evolving their business activities, the Ph.D. degree becomes less pertinent. "Ph.D.s are needed in the critical-thinking phase, which requires higher-level skill sets," explains **Wendy Penry**, associate director of human resources for HGS. "As we have grown, we have moved into a steady state where different skills are needed, and over time we have had fewer positions that require a Ph.D." This is because as the company developed and established

its research "recipe" for manufacturing certain drugs, it is less important to have more Doctorates who design the drugs in the first place. "The recipe has been set, so we have shifted our hiring practices to candidates who can operationalize the effort," she says. In addition, once the formula is solidified, the environment becomes standard operating procedure (SOP)-driven, which requires less scientific thinking and more procedural output, although these jobs still demand a thorough understanding of the technology. Today Ph.D.s account for 15 percent of HGS's scientific workforce, whereas B.S.s make up 50 percent and M.S.s (or M.B.A.s) make up between 15 and 20 percent.

"We believe that B.S. and M.S. associates will continue to remain a strategic part of advancing our company," says Chadha. "Our core Ph.D. teams are in place. The bulk of what we need in the future will come from B.S. and M.S.-level scientific professionals." HGS partners with institutions such as the University of Maryland and community colleges "to make sure graduates are well-equipped to transition into the workforce." Interns play a big role too. Chadha notes that 100 percent of those who do a two-year internship at the company come back for full-time employment.

Startups also notice the necessity of Bachelor's and Master's-level experts, especially as firms grow. **Bruce Seligman**, who founded HTG Molecular Diagnostics in Tucson, Arizona in 1997, still only has 45 employees. Of those, six are M.S.- or B.S.-level scientists and six are Doctorates. Some of the Master's-level scientists conduct their own research projects and operate at a level close to that of an entry-level Ph.D., he says. "Most companies, as they grow and develop products and successfully sell those products, will expand their manufacturing and operations side and not their research," he explains. "Research is always the future of the company, but it is a drain and not a profit center." When that happens, more science jobs in manufacturing and operations become available, which are usually filled by people with Bachelor's and Master's degrees. "You don't need as many Ph.D.s in manufacturing and operations," he adds.

Trent Yantes received a B.S. in agriculture from Wilmington College in Ohio in 1997 and went to work for Monsanto shortly afterward. Through the years he has climbed the ladder to his current position as the North American biotechnology field testing lead. In this appointment, Yantes manages a team that conducts regulated field trials for projects in the company's research and development pipeline. This work includes planting and harvesting trials across the country, as well as collecting data on each trial that is sent to other Monsanto scientists for further analysis. Prior to becoming the team lead, Yantes was a member of the North American corn-breeding field-testing team, where he was responsible for managing various cornfield trials, including trial planning, planting, harvesting, and data collection. "I feel my B.S. degree in agriculture prepared me well with the



Melissa Harper



Wendy Penry

educational foundation I needed to start my scientific career at Monsanto," he says. "However, it's really been the on-the-job experiences I've been awarded throughout my career, working on exciting science and learning from other scientists, that have allowed me to continue to develop and be challenged in my career."

"The whole paradigm is changing," says **Peter M. Pellerito**, interim vice president for state government relations and alliance development at the Biotechnology Industry Organization (BIO). "To some degree, a B.S. can substitute for a M.S., and a M.S. can substitute for a Ph.D. While specialized knowledge of a Ph.D. is hard to replace, as a company gets bigger, there are more opportunities for B.S. and M.S. scientists."

THE WAY OF THE CONTRACTOR

In the current economic environment, more and more B.S.- and M.S.-degreed professionals are seeking contracted or temporary positions in industry. Also referred to as contingency jobs, these positions in big pharma, biotech, and other life sciences-related organizations offer openings in cases where large companies might not be hiring for permanent positions.

According to Edwards, "the contingent workforce is growing 25 times faster than the permanent workforce, and currently, 25 percent of all U.S. jobs are temporary." He predicts that this number will grow to 50 percent over the next decade.

This is good news for recruiting firms such as Kelly Services and Yoh, and for B.S.- and M.S.-level scientists looking for employment. "If there is more hiring, it will be done on contingency," affirms Ferguson. "That's where the hiring is still alive . . . The companies have work to be done, and as they downsize their labor, they need contract workers" to fulfill the tasks at hand. Edwards remarks that Kelly Services has seen a 50 percent increase in its offer of scientific jobs in the last year alone.

Terri Hinshillwood, who holds a B.S. in biology from Eastern University in Pennsylvania, has found all of her jobs through contracting companies. She says that for new graduates, this is often the best way to break in to industry. "A lot of companies want you to have experience and the contracting positions are the way in," she says. Amidst an uncertain economic future, she has seen positions advertised by pharmaceutical companies, for example, that quickly cease to exist—they get cut because of budgetary issues, or the jobs might not be needed to be filled until a later date but the HR representatives are looking to gather resumes now. This can be an annoying waste of time for the applicant, she says, but when a contracting firm advertises an opening, you know it is a position that needs to be filled immediately.

There are downsides to pursuing contingency employment. Health insurance and retirement are not guaranteed, and there's no knowledge of what you will be doing after the contract is completed. "A lot of contractors want to become permanent and sometimes the company can't bring you on," says Hinshillwood. Temp jobs most often transition into permanent positions "during good economic times," clarifies Ferguson.

Another challenge for some contingency workers is that you may not feel as though you are part of the company or that you don't have a stake in the organization's success, because frankly, you don't. And your company colleagues, with whom you labor side by side, may adopt a negative attitude that "you're just a contractor," observes Hinshillwood. This can leave some contractors feeling that they are being treated unfairly. But a bad attitude that overtly reflects feelings of disconnection with the client company can hurt your career, she cautions. "If you do a good job with the contracting company, they are more likely to work with you again." And although some contracts can end when a task is completed, she has had no problem asking for more assignments either in her current department or in another. Often the temp agency will assist with this effort.

ADVICE FOR THE FUTURE

"The people who are graduating today should take a strategic view of the industry," advises Edwards, "and pinpoint areas of growth to understand where the jobs are." One way to do this, he suggests, is to collaborate with a recruiting firm that keeps detailed statistics



Trent Yantes

concerning industry needs, often organized by regions, tasks, and skill-sets required. This detailed information can assist a recruit in finding the right opportunity for them. Job seekers can also research companies on their own via trade associations at the international and national levels, such as BIO, as well as professional organizations devoted to geographic areas. But no matter how you find the jobs, Yantes stresses that the circumstances in industry are prime for B.S. and M.S. scientists to triumph. "I'd really encourage anyone with a B.S. or M.S. degree interested in life sciences to pursue [a job in industry]. The career opportunities are there, the work is challenging and the chance to participate in science that is making a difference is very rewarding."

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