SPOTLIGHT ON BIOTECH/PHARMA

Advancing life sciences

As both industries grow, the dividing line between them is vanishing, offering more opportunities for early-career researchers.

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Matt Bell, MedImmune

THROUGHOUT HISTORY, the wealth and power of Big Pharma has ebbed and flowed to match its popularity. The World Health Organization (WHO) predicts that the global pharmaceuticals market will be worth US$400 billion within three years. The 10 largest drugs companies control more than a third of this market, several making sales of more than US$10 billion a year. But biotechnology is booming too with companies experiencing a steady increase in number and size since the 1990s. In the United States, as of 2012, life science firms employed 1.62 million people in more than 73,000 individual business establishments. Since 2007 there has been a 17% increase in the economic output from the US bioscience industry, according to the report *Battelle/BIO State Bioscience Jobs, Investments and Innovation 2014*. As both industries have grown, they have also moved more closely together, and the dividing line that once existed between the two sectors is quickly vanishing. As advancement in life sciences increases, opportunities abound for scientists who wish to improve healthcare through R&D.

Roche Headquarters in Basel, Switzerland.

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Blurred Lines

Big Pharma built its business on small molecule chemistry, says Matt Bell, COO of MedImmune, the biologics R&D arm of AstraZeneca, whereas biotech companies traditionally focused on larger molecules. Klaus Lindpaintner, chief scientific officer of Thermo Fisher Scientific, one of the world's leading science, technology and diagnostic companies, believes that "the distinction between biotech and pharma is blurring because many pharmaceutical companies are increasingly using biotech tools and approaches, or are engaging in biotech research through partnerships and other arrangements," he says. As both enterprise types are focusing on biopharmaceuticals and utilizing similar instruments, techniques and methodologies, Dr Lindpaintner says the technological differentiation is dissolving.

In the early to mid-2000s, as it considered its direction, Pfizer weighed up whether small molecule therapeutics were the only way to go. Around the same time, Amgen started building small molecule capabilities to complement its large molecule research platform. "The end goal for Amgen was to pursue the most compelling biology, regardless of the modality," says Margaret Chu-Moyer, executive director of research at Amgen, who worked for Pfizer for 16 years before joining the biotech company in 2009. "Today, we work in a single organization [within Amgen] called Therapeutic Discovery that can engineer the appropriate molecule for the disease target, be it a protein, antibody, peptide, small molecule or combination thereof."

AL WEEMS PHOTOGRAPHER

Margaret Chu-Moyer, Amgen

This comprehensive attitude to solving life science problems is now industry-wide. As Big Pharma began wading in the biologics pool, biotech companies began examining how small molecules could enable their success as well. "When people think of biotechs, they think of harnessing bioorganisms to produce large molecules, and not chemistry," says Chu-Moyer. "But each side is converging towards a model where all modalities are important."

Some would argue that the titles "Big Pharma" and "Biotech" might not even apply, as many of the multi-national pharmaceutical corporations now describe themselves as biopharma firms. In its official marketing material, Roche labels itself as the world's largest biotech company, a somewhat surprising statement given the company's historical brand as a Big Pharma. And PhRMA, the Pharmaceutical Research and Manufacturers of America, identifies itself as representing "the country's leading biopharmaceutical researchers and biotechnology companies."

Risky business

In large companies, there are "bigger budgets, and fewer risks because people are working on more than one project," describes Katrin Arnold, recruiter for research

& Development (R&D) at the Roche Innovation Center Basel. Projects go into more depth as a result of increased support on both the administrative and technical sides. And if an employee doesn't contribute, or makes a mistake, they only risk a bad performance review or losing a possible promotion.

Working in start-ups requires a different mindset compared to an established firm. "The operating framework is very different," says Eliot Forster, CEO of Immunocore, a biotech with approximately 150 employees. In a baby biotech, where every penny and person's work is scrutinized, when someone doesn't do their job, the company itself might stall and come undone. "The foundation of the vast majority of venture-backed biotechs is built around one or two assets," says Forster. "A drug failing can cost the business everything. In a pharmaceutical company, it's just the programme that dies."

Crafting Careers

While the skills needed for success in Big Pharma, biotech and start-ups may differ depending upon the project and product line, experts agree that one attribute remains vital: "Someone who is curious, a self-starter and has high energy is needed everywhere," says Forster.

When Arnold recruits for R&D positions, she looks for evidence of scientific excellence, demonstrated by a candidate's publication record, methodologies and technologies they have used or invented, and considers where they received their degrees and undertook internships. She also looks for an interest in and ability to learn new things.

But in other cases, desirable attributes diverge depending on the size of the organization and how far it has progressed. For those looking to be "a lone ranger, where they can shoot from the hip," a start-up might be perfect because it emulates academia in certain ways, says Lindpaintner. There is a high level of uncertainty in start-up environments, especially as they truly begin to scale up, "so someone who can deploy their skills in an ambiguous environment around a common goal can be very successful here," adds Forster.

Established companies have a breadth of expertise, technologies and career opportunities available to tap into, and the stability of the enterprise means that infrastructure is already in place to bring drugs to market. "The dimensions and the cultures are different," says Lindpaintner. Big Pharma or large biotechs can seem like behemoths, where projects move slowly through bureaucratic channels that require multiple employees to authorise. "These are essential to navigating a regulated environment but anathema to rapid course corrections and more disruptive innovation," he says. The start-up ecosystem provides agility and the ability to move quickly amongst its staff, a perfect fit for Big Pharma partnership.

Experts disagree as to whether scientists can easily move between large and small pharmaceutical and biotech firms. "In general if you start in biotech, you stay in biotech," says Chu-Moyer, in part because of the attractive culture. "Once you get bitten by the biotech bug, like a serial entrepreneur, you don't want to leave."

Those whose careers are launched in a pharmaceutical ecosystem and want to move to a biotech, especially a start-up, will be welcomed. "Even though in Big Pharma you only work in a certain position on the [drug development] continuum, you touch all other areas," says Chu-Moyer. "This is very helpful to a start-up."

However, going from a start-up to Big Pharma is not as easy or common thus far. "The critical mass of people 'growing up' in biotechs and moving to Big Pharma doesn't exist yet," says Forster. He suggests that this may change, especially in geographic areas that have large industry clusters devoted to healthcare and life sciences, like Boston, the Bay Area and San Diego. With large numbers of companies at different stages and in different drug market areas, industry clusters provide their own critical mass of opportunities for scientists to move between firms.

"Someone who is curious, a self-starter and has high energy is needed everywhere."

Eliot Forster, CEO of Immunocore

Preparation

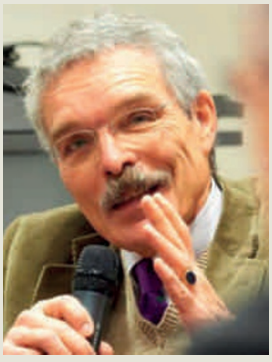
To land that dream job in the life sciences industry, networking is critical, say experts. Scientists should do due diligence on the types of companies that interest them, and find insiders who can share their experiences within the borders of the organizations. "Go to conferences that aren't necessarily related to your field, but are frequented by industry representatives," suggests Marco Baralle, group leader, Biotechnology Technology Transfer Unit, of the International Centre for Genetic Engineering and Biotechnology in Trieste, Italy.

Knowledge of the business behind the bio is vital to successful job seeking and beyond. "Do a postdoc in a lab that collaborates with a biotech company," recommends Baralle. Team collaboration, project leadership and communication across functional areas and with different audiences are all highly sought-after skills regardless of the enterprise. At Roche, Arnold looks for scientists who have shown leadership in the lab, or what she refers to as "leadership potential", which could demonstrated by overseeing projects outside science, such as in an extracurricular activity.

Ultimately, the key to forging an enjoyable and meaningful career in biopharma, whether it is in a large established company or small newcomer, is knowing one's own abilities and establishing goals. "Be clear in your mind what gets you out of bed in the morning," says Bell. Arnold's advice comes down to some very simple and yet strategic guidance: "Follow your heart. Find the path that you really want to do".

This content was commissioned and edited by the Naturejobs editor

Mutual magnificence



KLAUS LINDPAINTNER

Klaus Lindpaintner, Thermo Fisher Scientific

One reason behind the life sciences industry's continued boom is the collaboration between Big Pharma or large biotech companies like Amgen and smaller start-ups, which now serve as the cornerstone of advancing the mission of all parties involved. "When Pharma wants true innovation, they have to look outside," says Lindpaintner. "People on the outside can take the risk….with outputs that support the mothership."

A company could have such arrangements with multiple biotechs, each one considering a different drug potential, and can involve personnel from each company working in each other's labs.

Another type of partnership could involve a service contract, in which the pharmaceutical giant pays for all the research on a particular molecule being explored by the start-up, and then issues royalties based on success. Alliances could also be in the form of licensing deals or strategic purchases of specific products or technology. Some are seemingly simplified mergers or acquisitions.

For example, in 2005, Roche acquired Glycart Biotechnology "to strengthen expertise in therapeutic antibody research," as the purchase was announced. Today it is known as Roche Innovation Center Zürich, a research unit of Roche. Out of this alliance came Gazyva, a prescription medicine that is used to treat chronic lymphocytic leukemia (CLL) in adults, the basis of which was discovered by scientists at Glycart. No matter how partnerships manifest, "increasingly, synergistic relationships between big and small companies are the drivers of innovation," says Lindpaintner.

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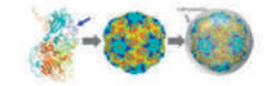


Faculty Search for Zhejiang University, China

"Hundred Talents Program"

Zhejiang University (ZJU) is seeking faculty candidates for its newly launched, highly competitive and well funded "Hundred Talents Program". This search covers all colleges and departments at ZJU. Applicants, expected to be about 35 years old, should hold PhD degree, and postdoctoral experiences are preferred for applicants in most fields. Applicants should have demonstrated commitment to excellence in teaching and research at a level comparable to the academic achievement of assistant professor or associate professor in world-renowned universities. Successful candidates must work full-time and are expected to establish internationally competitive and independent research program in cutting-edge areas of the relevant field at ZJU.

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Qualified applicants are strongly encouraged to submit their applications electronically to **tr@zju.edu.cn**. Applicants should include the following materials in pdf format: a comprehensive CV, a statement of research and teaching plan, and a list of 3 to 5 references with detailed contact information.

Contact: Talents Office, ZJU
Tel: +86-571-88981345, +86-571-88981390
Fax: +86-571-88981976
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- Manages, motivate, develops and trains junior associates and scientists
- Introduces professional concepts that contribute to the development of the company's technology base for both research and commercial purposes and to achieve objectives in creative and effective ways
- Contributes to patents, publications and technical reports used in regulatory filings;
- Effectively represents the company at scientific conferences and business development opportunities, through presentations of scientific material in a variety of formats
- Interfaces with external scientists or clients on scientific projects that are collaboration- or contract-based

Minimum Qualifications
- PhD in Immunology or related field with post-doctoral training followed by a minimum of 8 years professional experience working in the field of vaccines research
- Bio/Pharma industry experience
- Experience in the supervision and training of technical and management staff;
- Demonstration of scientific creativity and initiative contributing to the success of team and company goals;
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- Ability to prepare clear and accurate reports for internal and external projects
- A proven track record of leadership and success within vaccine research is essential for this position

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- In close collaboration with other members of the group, other departments and/or external collaborators, help determine doses, safety and efficacy of the chosen therapeutic approach
- Be accountable for project success and timely results delivery

Minimum Qualifications
- PhD in Immunology with 2 years of experience or PhD in other relevant discipline (Cell Biology, Molecular Biology, Biochemistry) with 5 years of experience related to vaccines discovery
- Experienced with conducting a variety of immunoassays (e.g. Elispots, Antibody Stimulated Cell response) in different model systems
- Experience of isolating and culturing different primary cells of the immune system and of using FACS for their characterization

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Responsibilities
- Hands-on and technical and team leadership of all aspects of virology and infectious disease research. Oversee scientists and research associates or members of project teams (as needed) in the initiation and execution of laboratory experimentation.
- Oversee in vitro and in vivo infectious disease models with a particular focus in molecular virology.
- Demonstrate leadership in the laboratory, oversee and delegate experimental/project responsibilities, independently champion technology development projects, be involved in new product evaluation, and definition of process platforms.
- Communicate project goals and results to team members across functional roles/departments. Identify issues and develop solutions in a collaborative multidisciplinary environment.

Minimum Qualifications
- Ph.D. in Biological Sciences and 8 or more years of relevant industry experience
- 2 + years' Experience in managing a research team
- Hands-on experience in a wide range of laboratory techniques, especially handling a variety of viruses, carrying out animal studies, biological assays, cell culture, ELISA, Western blot, intracellular cytokine staining, flow cytometry, RNA isolation and RT-PCR, and qPCR.
- Motivated, high energy, organized and familiar with the relevant literature as well as innovative scientific thought

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