

The right track for you in biotech and biomedical sciences

Laxmi Ravi Iyer & Sandhya Sriram

In Singapore, a recent panel showcased the many career paths and options available for those in the biotech sector.

Graduating from college or university with a degree in hand is the easy part. The difficult question is, “What’s next?” For most with a bachelor’s, master’s and/or PhD degree in biological sciences, biomedical engineering, environmental engineering, biochemistry and other sectors of biotech, the major questions on their minds are, “Am I on the right career track?” “How do I move forward? What can I expect in terms of jobs and other career prospects in my field of specialty? What’s my pay scale going to be like?”

To answer these questions and to lay down the various career opportunities for biotechnologists and biomedical engineers, media portal biotechin.asia recently organized the first of a series of career talks in Singapore¹. The event was sponsored and supported by the Student Affairs Office, the Biomedical Engineering Society, and the School of Chemical and Biomedical Engineering (SCBE) at Nanyang Technological University (NTU).

Introspection is the first step

There is an undying urge in every human being to grow and realize the goal of life. This urge to grow, although fundamental, varies in intensity. The basic forces that drive us to attain these levels are conviction, courage and confidence supported by resilience. Abraham Maslow, in his famous theory of the “hierarchy of needs,” believed that every human being is motivated by five sets of needs: physiological, safety, social, ego and self-actualization. As the lower needs are satisfied, you start pursu-

ing what truly matters to you. Everyone finds fulfillment in different ways, and the primary goal of a career seeker is to understand what brings them the most happiness. Knowing your interests and passion is very important in charting your career path.

This was the recurring theme of the career talk, which featured speakers from various career paths in biotech and the biomedical sciences. They shared stories of their personal journeys and gave insights into the various opportunities available in their respective fields.

Academia as a career

Sierin Lim discussed her passion for protein engineering and her choice to remain in academia, which led to the establishment of the Bioengineered and Applied Nanomaterials laboratory (BeANs) at NTU. She described how exciting research can be and how as an associate professor at SCBE-NTU, she assumes various roles such as scientist, teacher, writer, business manager, motivator, mentor and public relations person. Although her passion and interest in science was kindled by her mother, mentoring by her postdoc advisor and professor led her to choose academia as a profession. As an ambassador for women in science, technology, engineering and math (STEM), she spoke about the gender inequality in STEM fields.

According to Lim, an active career in academia is multifaceted and challenging, but it is the passion that drives her and many others. “Publish or perish,” although a common saying, is in fact the norm. The measure of a successful career in academia is the number and quality of your publications.

Alternative careers in science

Vandana Ramachandran, head of administration at the Institute of Medical Biology, Agency for Science, Technology and Research



Speakers at biotechin.asia’s careers talk in Singapore. Left to right: Laxmi Ravi Iyer, Sandhya Sriram, Shuwen Koh, Vandana Ramachandran, Sierin Lim.

(A*STAR), spoke about making the transition from full-time research to her present role. She followed the typical research and academic career path at the Scripps Research Institute in California before making the switch to research administration. Being an active member of the postdoc society at Scripps made her realize that her true love and strengths lie in connecting with people, organizing events and networking.

In her present capacity as the head of administration, Ramachandran handles grants management, business development, industry liaisons, financing and budgeting, scientific outreach and/or communications, scientific conference organizing, health and safety monitoring at the institute, research operations and laboratory management. She is also part of the career development committee for postdocs and PhD students at the institute as well as the initiator of A*PECSS, A*STAR’s postdoc society.

She summarized the various options available for people who want to pursue science-allied careers but do not want to do active bench work (Box 1).

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Box 1 Various science-allied career options**Government**

- Research administration
- Grants management
- Science policy
- IP management

Industry

- Business development manager
- Regulatory affairs
- Foresight manager
- Field application specialist
- Sales & marketing
- Technology transfer
- Licensing associate
- Patent agent

Recruitment

- Science recruitment

Education

- Teaching
- Lecturing

Science communications

- Editing/writing
- Corporate communications
- Science outreach

Scientific services/research support

- Laboratory manager
- Health, Safety & Environment specialist (safety officer)
- Technology experts (core facilities)
 - Microscopy
 - Sequencing/genomics
 - Histology

Forensics

- Forensic science division
- Head hunter

the experience of starting your own company and the realization that you are your own boss is an eye-opener. You end up working long hours and always wish that you had more hours in the day; however, as it is something that you have started out of passion, the time and effort taken do not really matter. It is extremely helpful if you have a great support system, such as supportive and understanding family and friends.

S.S. also spoke about how Singapore is increasingly becoming an attractive place for startups². Millions of dollars are being pumped into healthcare and biotech segments in Asia³, particularly in the subsectors of wellness and benefits, patient and consumer experience, big data and analytics, improving aging and clinical decision support.

Conclusions

Overall, the event showcased the myriad career paths and options that are available for those in the biotech sector. While recollecting their personal journeys, the speakers emphasized the importance of networking, talking to people, working or internships to gain experience, and building your resume as key to finding your dream job. And it all begins with discovering yourself and knowing for sure what you want to do in the long term. The take-home message was that there are various career opportunities for those in biotech and the biomedical sciences, and they are not just limited to academia, industry and education as was once thought.

It is indeed an exciting time to be in the biotech and healthcare industry. Yes, there is a strain on employment opportunities every now and then, but healthcare is a sector that never sleeps. Sometimes you need to just think a little out of the box and try to explore your other skills that could put you on a career path that you may have not thought of before.

COMPETING FINANCIAL INTERESTS

The authors declare competing financial interests: details are available in the online version of the paper (doi:10.1038/nbt.3376).

1. Lim, S. *et al.*, oral presentations given at the biotechin.asia "Career talks: The right track for you" event, Nanyang Technological University, Singapore, 27 August 2015.
2. Wong, W.H. *The Straits Times* <http://www.straitstimes.com/business/companies-markets/singapore-is-ideal-home-for-start-ups> (13 August 2015).
3. StartUp Health Insights. *Digital Health Funding Rankings—2015 Midyear Report* <http://www.startuphealth.com/content/insights-2015q2> (2015).

A career in innovation and commercialization

Shuwen Koh, an independent consultant who manages strategic alliances, innovation and development activities at National University Health System (NUHS), Singapore, helps run the Innovation Transfer Office at NUHS and acts as a business advisor for a private medical device startup. Koh is a dynamic personality who spoke about self-realization and how she was sure, during her PhD studies, that she did not want to pursue a postdoc, but instead wanted to pursue a more "exciting" role. As a consultant, she says her sound knowledge in the scientific field is as valuable as her ability to network and forge strategic alliances. By writing proposals, promoting companies, managing projects and dealing with contracts and intellectual property [IP], she helps bring scientists and clinicians together so that real science is translated into something more tangible.

Koh highlighted the importance of networking in advancing in your career. She emphasized that people invest in a business, not a technology, and you must understand industry trends, local challenges, barriers and specific complexities before plunging headlong into industry.

Quoting Rachel Huber ("Fear is the brain's way of saying that there is something important for you to overcome"), she mentioned that the transition from academia to industry can seem daunting, but you need to overcome

the fear. It helps to be aware of your strengths and weaknesses and create something of value based on your skill. You need to be tenacious and actively seek opportunities or sometimes even intern for free while job hunting. She suggested taking the Myers Briggs test (<http://www.myersbriggs.org/my-mbti-personality-type/mbti-basics/>), which can help you become more aware of your personality and may help you decide on a career.

Being an entrepreneur

Finally, we spoke about startups and entrepreneurship. Aspiring to be responsible science journalists without sensationalism, L.R.I. particularly spoke about how we launched the media portal biotechin.asia a few years after our PhD graduation. With the boom in biotech and healthcare startups in Asia, featuring startups in this field became our website's unique selling point. Startups are synonymous with risk and you need to be daring and willing to take the risks associated with setting up and starting a company. As founders ourselves, we believe the risk is very much worth it in the end. She also spoke about current trends in the biotech and healthcare industry that is moving towards precision medicine and big data.

One of us, S.S., shared her unique perspective on managing a full-time job as a postdoctoral fellow and running a startup. Having your own startup is like going back in time and learning the alphabet all over again. But

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