From Research to Innovation and Enterprise

Singapore has done well in the past 5 decades to arrive at where it is today - a competent, efficient and clean government, a cohesive, safe and secure country that is economically competitive, and diplomatically strong, with multi-racial and multi-religious harmony. Without any natural resource or hinterland, its best and most valuable resource is its people - a source of intellectual capital. We live in a world that is increasingly inter-connected, complex and complicated which poses challenges to Singapore’s survival. To stay competitive, the approach is to further develop its economy that is driven by innovation, knowledge-based with a highly skilled workforce. This in turn can bring about societal benefits.

The Singapore government therefore has invested heavily, crafted policies and implemented initiatives to develop Research, Innovation and Enterprise (RIE) in Singapore. Several tranches of monies, policies, and initiatives have been made since the early 2000s (National Technology Plan (NTP, 1991-1995), National Science and Technology Plan (NSTP, 1996-2000), Science and Technology 2005 (S&T2005) Plan, Science and Technology 2010 (S&T2010), and RIE 2015 (2011-2015), totalling SGD$41.65B). The National Research Foundation (NRF) under the Prime Minister's Office was established to take care of the RIE development in Singapore. Public sectors such as EDB, SPRING and A*STAR are active contributors to the growth of RIE in Singapore. These were targeted at increasing research output in Singapore, propagating the research output to other public and private entities, and then, the implementation of these research output in the form of enterprises releasing products, processes and services that contribute economically, increase productivity, and bring about societal benefits such as job creation and enhancement of living conditions due to technological advancement.

Several supportive grant schemes have been created along the research-to-commercialization continuum for public, private, local and overseas entities to grow Singapore’s RIE for socioeconomic benefits. Infrastructure has been established to facilitate RIE implementation and encourage entrepreneurship. For e.g., the technology transfer offices in public institutions such as universities, A*STAR, and other institutes of higher learning as well as incubators and private sector accelerators to name a few. An example of a research-to-commercialization success story is Clearbridge BioMedics (CBB), which is a spin-off from the National University of Singapore (NUS), by Professor Lim Chwee Teck et al, based on their invention of a novel circulating tumor cell platform technology, that has applications in oncology research and diagnostics. CBB has been incubated by Clearbridge Accelerator, which is a high-technology incubator backed by NRF. To tighten and grow the local ecosystem for RIE development, PM Lee announced in 2013 the allocation of SGD$200M to develop four innovation clusters in Singapore, i.e., medical diagnostics, additive manufacturing, membranes, and language processing to accelerate the translation of research technologies into innovations for socioeconomic impact. The first cluster that was awarded the funding is the medical diagnostics cluster, known as the Diagnostics Development Hub, co-led by Exploit Technologies Pte Ltd of A*STAR.

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Therefore, the Singapore RIE ecosystem is getting more exciting and vibrant. At the top level, the government has been and continues to be extremely supportive with its huge investment, policies, initiatives and infrastructure. At the ground level, several public and private entities provide support and mentorship to assist the transformation of research technologies into commercializable products and services. Therein lies career opportunities, in addition to the academic or industrial research scientist or engineer route one can pursue upon PhD completion. The subsequent two articles of this issue of our newsletter shall feature two alumni who have pursued career opportunities that is (further away from research,) in the space of innovation and enterprise of the research-commercialization continuum.

By Poh Yong Cheng

FROM RESEARCH TO INDUSTRY: AN INTERVIEW WITH DR LEONG MAN CHUN

What are you doing now and which company are you working for?
I am currently working as an application scientist at Clearbridge Biomedics. The company is based in Singapore and it specialises in microfluidic platform and technology for research and diagnostics-related applications in oncology.

How has your Ph.D experience helped you in your current job?
I personally feel that the technical, scientific communication and time-management skills are the skillsets I have honed from Ph.D training and are pertinent to my current job. My current role as an application scientist is customer-facing which requires me to engage in scientific communications with customers and collaborators. For example, my current scope of work involves troubleshooting technical issues faced by users of our microfluidics technology. The issues faced could be quite diverse—ranging from issues pertaining to microfluidics, choices of antibodies and various cell based assays and I feel that my technical experiences with micro-fabrication, cell biology and cell signalling during the course of my doctorate study prepared me adequately to tackle these issues. While Ph.D projects are usually undertaken in niche or specialised area, Ph.D training offers countless opportunities and occasions to present research results during lab and conference presentations, sometimes to audiences who are less familiar with the particular scientific domain. The ability to communicate in a clear, simplified and logical manner is certainly a transferrable skill.

What advice do you have for our alumni who wish to pursue a career in your field?
There are non-academic opportunities for Ph.D graduates, which we will only learn more about through friends and other professional contacts. As such, building and maintaining a healthy network of professional contacts, through conferences, workshops or vendors are great and would be important for those who wish to venture out of research.

About Clearbridge BioMedics
Clearbridge BioMedics is a clinical stage oncology research and diagnostics company that enables real-time liquid biopsy using a label-free Circulating Tumour Cell ("CTC") enrichment platform. It is a National University of Singapore (NUS) spinoff company that is committed to revolutionizing cancer diagnostics and patient care.

www.clearbridgebiomedics.com
https://www.youtube.com/watch?v=aRBUoXlfX3g
Hey! I am Yong Cheng. My NGSS PhD stint was with the Department of Biomedical Engineering, Faculty of Engineering: Under Dr Martin Buist’s mentorship, I developed multi-scale and multi-physics gastrointestinal and some cardiac models. These models have been developed to help us understand disease mechanisms and can be applied to design and develop drugs and medical devices. NGS played a pivotal role to facilitate my PhD journey. I had the flexibility to work on research of my interest, and the experience was enhanced by NGS’ generous support such as its great people from the NGS office as well as monetary support for several conference and course participation.

Shortly after my PhD stint, I embarked on a Singapore-Stanford Biodesign Fellowship for further training. It was a life-changing fellowship which trained us on medical device innovation from the identification of unmet clinical needs, to the ideation of viable solutions as well as in the implementation of strategies to commercialize the solutions. The clinical theme for the fellowship was Cardiology, which I found exciting and that there are several unmet clinical needs with a Singapore/Asian angle. My sincere thanks to the many great folks that helped me during my time in Stanford, as well as in Singapore such as the local heart centers! The Biodesign stint inspired me to continue my pursuit in the innovation and enterprise space, and to contribute to the local medical technology ecosystem.

Currently, I am with a national initiative funded by the National Research Foundation, known as the Diagnostics Development Hub. Our Hub focuses on diagnostics medical technology development of projects from Singapore and beyond - We form partnerships in select projects with the right fit, and offer our developmental and funding support through our in house capabilities and external network to productize and commercialize the technologies. Our partners’ success in these projects is our success. Work is challenging but exciting. To combat stress, I like to participate in a variety of social and sports activities which includes chilling at cafés with friends, board games, gym, jogging and racket games. I’m also interested to make more friends and network; you can find me here: http://sg.linkedin.com/in/pohyongcheng/

Left: Recent Melaka Road Trip with colleagues (I’m bottom right)  
Right: Visit to Mystery Spot with team mates when I was Singapore-Stanford Biodesign Fellow

Congratulations!!!  
The Club welcomes the newest additions to our alumni extended family!
Just a day after the euphoria of donning the graduation gown and receiving the long-awaited certificate, the 8th batch of NGS graduates were invited to a sumptuous buffet dinner at the Nexus, University Hall on the 10th of July 2015 and welcomed as NGS alumni. The attendees of the 2015 NGS Alumni Dinner were presented with goodie bags upon arrival, with old acquaintances catching up with glee and new friendships forged between recent and past graduates. Interesting anecdotes of previous lab experiences as well as current job realities were exchanged as people gathered at the tables.

The evening started with a slideshow of pictures taken during the commencement the previous day. Following several announcements from Priscilla, President of the NGS Alumni Club, the dinner was officially kicked off with a light-hearted opening address from Professor Philip Moore, Executive Director of NGS, and everyone chatted easily with each other whilst queuing for the food. After the delightful meal, a networking game was conducted with all participants and sponsors involved. The 3 fastest people to fill up their blank list with contact details of attendees in the room won themselves a pair of tickets to the up-coming NGS Alumni event, which will be a movie screening on the 15th of August.

The lucky draw was conducted shortly after, and the winners undoubtedly must have felt fortunate to have walked away with a prize. The event ended with a group photo session which brought out the playful side of many present there. As the crowd streamed out, well-wishes were aplenty as the new graduates embark on their journey into the uncharted waters of working life. Many thanks to the organizing committee, as well as to the NGS staff Gloria Chen, Vivien Li and Irene Chuan for a lovely evening.

By Tan Mein Jin

MOVIE EVENTS 2015

Imagine a day of nostalgic gathering where great minds, both young and old, congregate to enjoy a common interest – Movie! We held our inaugural private movie screening at the Golden Village VivoCity on 9 May 2015 to watch the Avengers: Age of Ultron. That day greeted us with familiar faces of professors, family and friends, and delightful new little additions! With great anticipation, we organised our second movie event to watch The Mission: Impossible – Rogue Nation on the 15 August 2015. As people streamed in early to book their seats, we witnessed members catching up with old friends, reminiscing the good old times spent in lab and updating each other on career opportunities. We have purposed in our hearts to keep movie event a tradition henceforth, by offering not just irresistible movie treats, but also a networking opportunity to meet new people who may be our prospective colleagues or even employers!

By Priscilla Ang
I am sure...

I can afford medical expenses beyond MediShield Life

I can enjoy the retirement lifestyle I want

I can send my kids to their university of choice

I have a will to fulfil my wishes for my loved ones

Amidst the many uncertainties in life, one thing is for sure - our loved ones matter to us. Plan for a more secure future for you and your loved ones.

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