



AIMING HIGH WITH A*STAR

WITH A FOCUS ON DISCOVERY, INNOVATION, DEVELOPMENT AND GROWTH, SINGAPORE'S AGENCY FOR SCIENCE, TECHNOLOGY AND RESEARCH (A*STAR) IS ON A MISSION TO NURTURE A STEM RESEARCH COMMUNITY THAT KNOWS NO BOUNDS

RESEARCHER PROFILES



DR SHAWN HOON
Director Graduate Affairs
Biomedical Research Council (BMRC)
Director, Molecular Engineering Laboratory, Institute of Molecular and Cell Biology (IMCB)
Agency for Science, Technology and Research (A*STAR)

DR TECK LEONG TAN
Director Graduate Affairs
Science and Engineering Research Council (SERC)
Deputy Department Director
Materials Science & Chemistry Dept., Institute of High Performance Computing (IHPC)
Agency for Science, Technology and Research (A*STAR)



From the futuristic buildings to the beautifully biodiverse green spaces, Singapore is world-famous for being a modern, innovative and forward-thinking city state. It is a place of aspiration and attainment and now, thanks to the Singapore's Agency for Science, Technology and Research (A*STAR), is aiming to make its global mark in STEM research and development (R&D).

"Singapore is a knowledge-based economy which thrives on research, innovation and enterprise," explains A*STAR's Dr Shawn Hoon. To facilitate such progress, developing today's talent to be STEM leaders of tomorrow is key. This is where A*STAR, an organisation committed to STEM education and R&D, steps in. A*STAR's Dr Tan Teck Leong adds, "STEM education teaches critical thinking, problem-solving and scientific reasoning, skills that are important given the proliferation of technology in our day to day lives." A*STAR aims to nurture the potential of students, to ensure STEM innovations enhance everyone's lives.

As directors of graduate affairs for their associated councils – Dr Hoon for the BMRC and Dr Tan for the SERC – both scientists are keenly aware of the importance of ongoing education, mentoring and support for individuals to succeed and for wider communities to benefit. Here, they give us an insight into A*STAR's aspirations.

IN GENERAL, HOW WOULD YOU DESCRIBE THE STATE OF STEM EDUCATION IN SINGAPORE?

Having a strong foundation and pipeline of STEM talent enables our enterprises to remain competitive, especially in a world disrupted by COVID-19. It also drives us towards a society that harnesses relevant STEM knowledge to improve quality of life.

Internationally, Singapore students rank highly in mathematics and science, which speaks to the quality of our education system and our teachers. Increasingly, STEM education in Singapore has become more 'holistic' with the support of public and private sector organisations, and ground-up efforts to offer diverse STEM programmes catered to different groups*. For example, A*STAR conducts outreach activities such as co-organising the annual Singapore Science Festival with Science Centre Singapore, which is filled with exciting science-related experiments and exhibitions for

*This is based on an article by NIE faculty Professor Teo:
<https://iopscience.iop.org/article/10.1088/1742-6596/1340/1/012002/pdf>



THE A*STAR GRADUATE ACADEMY

The Graduate Academy's vision is to make A*STAR a global nexus for scientific talent. With a comprehensive suite of undergraduate, PhD and post-doctoral scholarships, A*STAR Graduate Academy (A*GA) supports top-class education both locally and overseas to help passionate individuals realise their full potential. Youth talent is also identified through extensive outreach programmes to nurture a vibrant diverse community of young scientific talent in Singapore.

Supporting overseas students creates a diversity of talent in R&D, and life experiences that will create a vibrant landscape for R&D in Singapore. This also helps to foster future research networks and alliances internationally, which is essential for shared learning and collaboration, and research opportunities.

“ A career in science and research also allows for an exciting journey towards making ground-breaking and important discoveries that could potentially improve the lives of people globally. ”

a hands-on experience and exposure to STEM, catered for different age groups. During the school holidays, students are offered opportunities in our research institutes, to supplement their STEM education and experience how classroom knowledge is put into practice at work.

WHY IS A*STAR COMMITTED TO NURTURING YOUNG SCIENTIFIC TALENT FOR THE R&D COMMUNITY IN SINGAPORE?

R&D is integral in giving Singapore an edge against larger and better resourced countries. The backbone of a technological, knowledge-based economy is a healthy scientific/research community.

The R&D community needs a mix of talent to take the science through from research and innovation, to high-growth enterprise. This means nurturing researchers at our public sector research institutes and universities, as well as in private sector R&D. Then there are research activities along the research, innovation and enterprise 'value chain', such as careers in intellectual property management, industry development, commercialisation, venture capital or entrepreneurship.

For example, in the area of food, some start-ups, like ShioK Meats, were spun off or set-up by A*STAR talent.

<https://www.straitstimes.com/singapore/foods-of-the-future-0>

A*STAR is committed to nurturing and grooming scientific talent, to catalyse innovation and raise competitiveness for the sustained economic growth of Singapore.

WHY SHOULD STUDENTS CONSIDER A CAREER IN R&D?

Almost everything in life is related to or can be explained by science. Hence, with a variety of niches and fields under the umbrella of science, there are myriad options for students interested in STEM to explore and venture into.

At A*STAR, we encourage our scholars to take ownership of their careers. Opportunities are open for PhD scholars typically after their first two years

at an A*STAR research lab to develop as scientists, technologists or venture into academia, business development, industry research and beyond.

HOW DOES A*STAR SUPPORT UPPER SECONDARY, JUNIOR COLLEGE AND POLYTECHNIC STUDENTS?

Through our extensive outreach programmes and the range of awards we offer, we expose students to science and research from an early age, fuelling their interest in the sciences and encouraging them to pursue their passion in research. We measure the effectiveness of such programmes by looking at whether these students go on to pursue STEM in their next phase of education.

WHAT DO A*STAR SCHOLARSHIPS OFFER STUDENTS?

An A*STAR scholarship is not just for scholars to get a degree; it is the foundation of their career in the R&D landscape in Singapore and globally. With hands-on experience, students can be aligned to the research interests before they embark on their training. Besides the financial incentives offered through scholarships, our scholars also have mentors to turn to for career advice.

Mentorship at the junior college/polytechnic level provides insights to a scientific career, and the traits and skills that a researcher should possess. Mentors provide guidance and support and apprise students of the latest science and technology happenings in A*STAR and Singapore.

FINALLY, HOW DO YOU SEE RESEARCH DEVELOPING IN SINGAPORE?

The research landscape is becoming more inter-disciplinary, where collaboration across research fields is needed to deliver tangible and impactful outcomes that address national challenges. As such, subjects under computing, information, engineering and technology with applications across an array of disciplines, such as in artificial intelligence, analytics and informatics, health and medical technologies, manufacturing resilience (such as food production and pharmaceutical manufacturing), could see potential growth.