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ASIA EDITION

Leveraging Academia-Industry Collabs to Scale-up S&T Innovations

April 28, 2022 | Opinion | By Hithaishi C Bhaskar

Agilent, National University of Singapore (NUS) and National University Hospital (NUH) launched a new translational research and development (R&D) hub, a S$38 million research facility that aims to boost clinical diagnostics and testing through biochemical innovation and techniques. The partnership demonstrated Agilent's strong commitment to increase R&D access and outcomes across the regional scientific ecosystem. Chow Woai Sheng, Vice President / General Manager, Agilent Technologies, (Singapore) shared more insights with Biospectrum Asia.



Global challenges are too large to tackle in isolation. The creation of new shared value in public research through academic-industry collaborations are gaining momentum in innovations in the science, life science, biotechnology, and pharmaceutical industries.

There is a need to recognise and value the contributions that academic-industry collaborations have on both current research and the future of science. As a global leader in the life sciences, diagnostics, and applied chemical markets, Agilent’s long-term partnerships with academia and universities have helped shape a sustainable innovation ecosystem in Singapore.

Technology is a key driver of research and innovation

New technology and systems are now an important area of concern to governments, and scientific research success increasingly depends upon advanced technology and sustainable innovation. When academic researchers explore problem statements, it is crucial that they have the freedom to pursue different solutions with the help of industries with technology innovation to develop those solutions.

This is the emergence of a new paradigm in academia-industry collaborations where a space is created for professional connections to boost idea sharing, research outcomes and training. The drive for collaboration was further fueled by the

Singapore government's Research, Innovation and Enterprise (RIE) 2025 plan, part of the National Research Fund (NRF) program in committing S$25 billion to take Singapore's science and technology to the next stage of development.

Impact of academia-industry collaborations

Academia and industry collaboration comes in many forms, covering a broad range of research areas from small co-funded projects to multi-milliondollar projects with the establishment of iconic analytical facilities that push scientific boundaries to enhance the quality of life for the communities.

Over the years, Agilent has achieved robust collaborations with academia in Singapore that focus on moving basic research to an outcome that can be used commercially or for the greater good of the communities.

To empower researchers, Agilent's solutions helped tackle fundamental laboratory challenges. For example, in the field of synthetic biology, a collaboration with Associate Professor Matthew Chang of Yong Loo Lin School of Medicine in Singapore enabled the exploration of potentially making synthetic biology more systematic, cheaper and more efficient.

In 2019, Agilent, National University of Singapore (NUS) and National University Hospital (NUH) launched a new translational research and development (R&D) hub, a S$38 million research facility that aims to boost clinical diagnostics and testing through biochemical innovation and techniques. The partnership demonstrated Agilent's strong commitment to increase R&D access and outcomes across the regional scientific ecosystem.

The collaboration represents a unique and innovative approach to conducting joint research into important health issues and medical science. The 'hub and satellite model' allows research to be conducted centrally in Singapore, and shared broadly in the local, regional and global platforms through key partnership and alliances supported by NUS and Agilent. This hub is a continuation of an established and significant partnership that has existed for many years between NUS and Agilent. By extending its substantial investments in R&D with Agilent's work alongside top universities, Agilent is able to accelerate its mission of enhancing the human condition.

Over the last two years, the pandemic has spurred industrial-scale production of mRNA, causing the biology modality to take on renewed importance. To make an impact on biopharma and life sciences, the Institute of Bioengineering and Bioimaging (IBB), a research institute under the Agency for Science, Technology and Research (A*STAR), partners with Agilent to study the efficient translation of mRNA and lipid nanoparticles (LNP). Lipids can be optimised to facilitate endosomal escape, enhancing protein translation.

Agilent's technology will support IBB with innovative thinking, multidisciplinary technology expertise, and training on world-class analytical development to help develop workflows and solutions to address LNP quality attributes. This collaboration is supported by Agilent's Global Solutions Development Center (GSDC), a hub launched in Singapore to advance integrated methodologies and novel applications working for projects worldwide.

With the Singapore government announcing its '30 by 30' ambitious plan to produce 30 per cent of the nation's nutritional needs by 2030, Agilent has signed two research collaboration agreements with the Singapore Institute of Food and Biotechnology Innovation (SIFBI), a research institute under the A*STAR and the Future Ready Food Safety Hub (FRESH), a research platform under the National Technological University (NTU). These agreements outlined the collaboration on developing food research knowledge advancement aims to bring science the technology to drive innovation in food, nutrition, ingredients, industrial biotechnology, and related applications.

Agilent's state-of-the-art technologies will help develop better food process engineering to create novel and sustainable future food safe for consumers. This initiative will drive the future of science in support of Singapore's growing food innovation ecosystem, ultimately satisfying the demand for safer, healthier, and more sustainable food locally, regionally and globally.

The translation of basic research into a high-value output of societal benefit is often driven harder where an industry partner is involved. This is seen in the pharmaceutical, biotech and other health-related industries that work on tight timelines and saw the application of academic research to accelerate that goal.

Investing in the next generation of scientists

For more than 20 years, Agilent has been working hand-in-hand with local scientists, researchers, and healthcare professionals to accelerate knowledge advancement to enable scientific breakthroughs and discoveries in Singapore.

As part of the company's commitment to developing local science talent, Agilent adopts the Industrial Postgraduate Program (IPP), a collaborative initiative with the Singapore Economic Development Board (EDB), to build capabilities among PhD

students on critical R&D skill sets and industrial experience. For eight consecutive years, the program saw Agilent harness a community of next-generation scientists in Singapore.

The company has also opened an Agilent University in Singapore, housing a 10,000 sq ft training facility equipped with three revolutionary laboratories and offering more than 200 courses to support local capabilities building. Since 1999, Agilent Singapore has grown its local team to over 800 scientists, skilled engineers, and employees to deliver trusted answers for Singapore, Asia Pacific and globally. It has bolstered its presence by expanding its manufacturing capabilities, from high precision automation solutions to mass spectrometry instruments made for global markets, supporting Agilent’s vision in growing strong local roots in key growth markets.