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Dr Somvong Tragoonrung, executive director of BIOTEC, one of the first biotechnology-focused research institutes

in Thailand, highlights their current research in biotechnology and genomics projects, as well as the local and international collaboration they have in place to further develop the strengths of Thailand in the field.

Could you introduce to our international audience the footprint of BIOTEC in Thailand?

The National Center for Genetic Engineering and Biotechnology (BIOTEC) was first founded under the Ministry of Science, Technology and Energy in 1983. After the establishment of the National Science and Technology Development Agency (NSTDA) in 1991, BIOTEC became a member of NSTDA. BIOTEC has been working very hard for almost 40 years on building research and development, infrastructure, human capability and technology platforms. BIOTEC has been able to operate more effectively to support and transfer technology for the development of the industrial and agricultural sectors and to improve the social and economic well-being of Thai people.
BIOTEC's work falls into a broad spectrum of bioscience and biotechnology research and how we could translate them into real-world application. Our research covers from agricultural science, biomedical science and environmental science, including plant biotechnology, animal research,

food and feed, medical research, and microbiology. Apart from R&D activities, strong focuses are on activities which include policy research, outreach programs, biotechnology capacity building, and international relations.

What are the strengths, assets and facilities that set Thailand apart from other innovation hubs in Asia and could contribute to making it the destination of choice for ambitious local and international high-tech companies?

First of all, the investment incentives are part of the Thai government's policies to transform Thailand into a hub for wellness and medical services within 10 years. The government helps the pharmaceutical manufacturers and offers a five-year corporate income tax exemption, for example. Thailand is one of the first countries in the area to have put in place the Universal Coverage Scheme. This definitely helped to improve citizens' access to affordable healthcare facilities and continues to drive the pharma market. Then, another strength that we have is that Thailand is blessed with an abundance of raw and compound materials which is a competitive advantage in the field of biotechnology. And finally, Thailand is already a medical tourism hub and maintains records of strong growth.

Currently, estimations indicate that roughly two million foreign patients come to Thailand to receive medical treatment every year. Of course, BIOTEC has a role to play in this. We are trying to develop more medical biotechnology in order to develop medical treatment and improve the positioning of Thailand. Through the National Biobank of Thailand, we are currently part of the Genomics Thailand consortium which is a collaborative research network to enable precision medicine. A catalogue of biodata and bio-information of the human genome and the availability of HPC infrastructure with big data storage and a back-up system will be utilized to accommodate analysis of human genomic big data. We truly believe that it can make a difference for Thailand.

The NSTDA's Dr Prasit highlighted to us the work currently being done on a new Health and Medical the cluster which aims to make Thailand a partner of choice for international collaboration. What are the key initiatives and partnerships being launched in Thailand to further enhance international multi-stakeholder collaboration?

Thailand has good infrastructure and one-stop supporting services. We have several research institutes in the medical fields such as the Thailand Centre of Excellence for Life Science (TCELS),

and the National Biopharmaceutical Facility (NBF). Compared with other places in the region, we have good infrastructure and strong networking. We have put in place collaboration with Medicines for Malaria Venture (MMV) with local and international collaborators. The team has been successfully developing a new antimalarial drug compound ‘P218’, which is very effective in killing drug-resistant parasites, and also safe for humans. The P218 is currently going to clinical trials with human volunteers. We are really proud of this research.

BIOTEC is working on different multi-disciplinary research activities. For example, a team has been working on the development of novel antimalarial drugs targeting enzymes in the folate metabolism pathway. Another team is working on the development of novel vaccines as well as new rapid diagnostic methods for Dengue viruses. We are trying to find a way to find rapid diagnostics methods for tropical infectious diseases which are public health threats in Thailand and worldwide. We are trying to develop those collaborations in order to tackle those diseases.

BIOTEC is positioning itself as the key partner of choice in terms of research and innovation. How can you compete with the other research institutes in the region?

We are well aware that we have strong competitors in the region. Japan is one of the leaders in Asia in the medical field. But we are all facing the same problem of the ageing population. One of the assets in Thailand is that we have a larger population, and that means more young people, too. We are trying to provide quality education to our younger generation, in order to have future high calibre researchers. We are developing our scholarship schemes in order to send our students to study abroad, and when they come back to Thailand, they would acquire the latest technology and know-how needed. Moreover, currently, the government is promoting programs to attract highly qualified personnel and even foreigners to work in public sectors. And the government even realizes that we have to invest in the pharmaceutical field.

In terms of international collaboration, last October you officially launched the Thailand-China Joint Laboratory on Microbial Biotechnology, in order to capitalize on the expertise of Thai and Chinese researchers to harness the power of microorganisms to develop solutions for global challenges. What are the main challenges of this collaboration?

The Thailand – China Joint Laboratory on Microbial Biotechnology was established in 2017. The studies revolve around the application of microbes in biotechnology. Collaboration with China has been launched, now we are initiating new ones with institutes in Belgium and Germany on the preservation and utilization of microbes.

Our aim is to enter into the field of global networking to have a global outlook.

You have a long-standing collaboration with Novartis in Thailand, what have been the main milestones achieved in this regard?

Partnership with a pharmaceutical company is an essential step to realize our upstream research in natural products for medicine since a pharmaceutical company possesses both expertise in commercialization of compounds and resources to carry it forward. We started this collaboration in 2005, and it marked the beginning of pharmaceutical and biopharmaceutical research at BIOTEC. The collaboration is based on drug discovery. The objective is to assess microorganisms' strains and natural product compounds isolated by BIOTEC for their potential use as sources or agents in human and/or animal health care application. Our collaboration is not only based on drug discovery, but also on human resource development. Through the collaboration, we have been able to create an internship program for 15 BIOTEC researchers to be able to work at Novartis labs in Switzerland and bring Novartis experts to BIOTEC labs.

How will you define success for BIOTEC in the next five years and what image of BIOTEC would you like to showcase to our international readers?

I would like BIOTEC to be seen as one of the top research institutes in biotechnology in Thailand. We will definitely carry on working on our scientific publication and research. In order to grow for the next five years, we have to identify what we are lacking right now, especially in commercialization skills. I hope that we will able to fill the gap between the lab and the market. We will be stronger in biopharma, including the development of human and animal vaccines, and will thrive to contribute to the Genomics Thailand. We saw improvement in terms of supporting measures from the government in the pharmaceutical field. They have put a lot of efforts and budget into human resource development and educational programs. In the future, we will have more experts in the fields. One person cannot make the difference, but a good supporting system could. We can then make a difference. I wish we could attract more talents to work at BIOTEC and pharmaceutical field which help to improve the lives of people in the future and provide

opportunities to less fortunate people to have a better life and to have access to better healthcare.

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