

Drive for 'Innovation Thailand'

11 November 2019 | News

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The aim is to generate 5 per cent of GDP or to add 1.5 trillion Thai Baht to the economy in a decade. And the medium to reach the target is innovation. After establishing itself firmly as a 'manufacturing hub' for over a decade, Thailand now aims to be an 'Innovation hub' with majority of activities going on in life sciences, medical and biotechnology areas. The government is emphasizing innovation as a part of its 20-year old national development strategy.

Several agencies and research & development organisations are working towards reaching the destination. Thailand Science Park at Phatum Thani, just on the outskirts of Bangkok, houses many of them with some other spread to Bangkok and some other cities in the country. These include the National Science and Technology Development Agency (NSTDA), National Center for Genetic Engineering and Biotechnology (BIOTEC), Thailand Center of Excellence for Life Sciences (TCELS), GMP Production unit for Cell and Gene Therapy products, Center of Medical Genomics, Thailand Bioresource Research Center (TBRC), Eastern Economic Corridor of Innovation (EECI), and the National Innovation Agency (NIA). Even some private companies are present in the Thailand Science Park using the facilities provided for innovation.

The state-of-the-art facilities set up at the innovation cluster of the Thailand Science Park include clean rooms providing ultra-clean environment, sensitive labs for sophisticated research and testing labs equipped with high-performance equipment for advanced research.

Among the various projects they all are working on and the success stories they share, an important one is of P218, a new anti-Malaria drug developed by BIOTEC's Protein-Ligand Engineering and Molecular Biology Laboratory. The development is crucial when two studies recently published in Lancet Infectious Diseases warn of Malaria drugs failing at an "alarming rate" as drug-resistant malarial parasites are spreading rapidly across South East Asia.

"Phase II clinical trials for the new drug P218 are on," said Dr Chairat Uthapibull, Director, Medical Molecular Biotechnology Research Group at BIOTEC. The group is also doing research on a new diagnostic technique and a new vaccine for TB and developing a new vaccine for dengue. They are trying many possibilities of protein or DNA combinations.

The research is being done in many other areas. The BIOTEC has six research pillars. They include medical devices &

implants, biopharma, biotech for industry & agriculture, and nanotechnology.

The Thailand Bioresource Research Center at the Thailand Science Park provides high quality repository and services for vast arrays of biomaterials to strengthen R&D. It provides safe deposit facility of strains, their isolation and identification, freeze drying and liquid drying, training and consultancy. TBRC has a storage of 90,000 strains.

"TCELS's GMP production unit for Cell and Gene Therapy Products at the park provides R&D leased space, clean rooms of B, C and D grade, analytical equipment of cell and gene manufacturing and quality assurance. Even private companies can take advantage of these services", said Kamchorn Balangura, Adviser, TCELS, while showing the clean rooms and other facilities.

One such private company utilising these facilities is Cryoviva Thailand, promoted by Indorama ventures of India, Cryoviva India and RJ Corp India. "It is a private cord blood and cord tissue bank started since 2007, giving access to stem cells, the futuristic therapy with unlimited possibilities," said Dr Ornnuthchar Pongpair, Project Manager and Regulatory Affairs, Cryoviva Thailand. Number of families storing the stem cells of their new born is growing in Thailand, she added.

TCELS's Center of Medical Genomics, set up 15 years back, is working in the area of precision medicine and allied topics. "Twenty genomes can be sequenced at the center each week," said Nareenart Iemwimangsa, Clinical Scientist at the center.

One of the important projects being implemented through the center is Yothi Medical Innovation District (YMID). "Stretching from Victory Monument to Rama VI Road in Bangkok, the 170-hectare known as Yothi area is being eyed as a test bed for research into medicines and health-related technologies," said Dr Sirasak Teparkum, Deputy CEO, TCELS.

The area is home to many hospitals and medical departments. It has more than 30 medical and specialised institutions, nearly 12,000 medical personnel and research institutes of over 2.5 million square meters supporting more than 7,000 patients. Thus, it has a potential to be a prototype for the development of medical innovation district. Now, it is being developed into a medical innovation center within 10 years under the country's plan to make Thailand a medical hub for Southeast Asia. "It is the first area-based innovation in Thailand focusing on medical innovation making into a medical Silicon Valley", said Dr Teparkum.

One of the institutions which is part of YMID is Mahidol University. Students from its Center for Biomedical Engineering and Robotics Technology (BART) Lab have developed Lower-Extremity Exoskeleton for Paraplegic Patients to help them walk. It is also in the process of several other such robotics aided equipment for surgeries, diagnostics and rehabilitation. It was displayed by the centre at the Thailand Lab International 2019 expo held at BITEC, Bangkok in September.

Thailand imports medical items worth 200 billion Baht annually. When YMID will be successful it is expected to contribute 7 billion Baht to the GDP every year.

The Eastern Economic Corridor of Innovation (EECi) is another project, a hub of industrial research and innovation, being developed to foster innovation capability. Located in Wangchan valley in Rayon province, EECi provides translational research facilities and quality infrastructure to support scaling-up of research work. The ambitious \$45 billion project is part of Thailand 4.0, a new economic model aimed at transforming Thai industries from manufacturing-based to high-tech. Thailand plans to do this by promoting innovation in different sectors.

Thailand's efforts are being paid in rich dividends as the World Intellectual Property Organization ranked Thailand 6th out of 17 countries in Asia in its Global Innovation Index 2018 published in conjunction with Cornell University. It has moved up seven positions reaching the 44th place on a global scale.

(Milind Kokje was in Thailand on the invitation from the organisers of Thailand Lab International 2019)