

Building Manpower Capacity and Capabilities for Thailand and ASEAN

Duangkaew Chongkachornphong

National Center for Genetic Engineering and Biotechnology (BIOTEC), Thailand



The National Center for Genetic Engineering and Biotechnology (BIOTEC) is a premier research institute in Thailand and Asia. Established in 1983, it has since built a pool of high-calibre researchers, set up robust R&D infrastructure and developed strong research capabilities to support the development of Thailand's bioindustry. One of the most important

aspects of BIOTEC's work is in growing human capital to drive the advancement of Thailand's bioindustry. In addition, it has proactively contributed to helping Thailand's ASEAN neighbours build up their own research and technical capacity through various human resource development initiatives.

Training of Post-graduate Students

Although BIOTEC is not a degree-granting institute, it has played an active role in guiding and nurturing many generations of Thai researchers over the years. Almost all 160 BIOTEC principle researchers serve

as co-advisors to life sciences graduate students from various Thai universities. These students often take part in on-going research projects at BIOTEC. This arrangement fits perfectly with the requirements and objectives of scholarship schemes such as the Royal Golden Jubilee-PhD Program offered by the Thailand Researcher Fund (TRF) and the Thailand Graduate Institute of Science and Technology (TGIST) scholarship from the National Science and Technology Development Agency (NSTDA). In 2011, BIOTEC hosted 149 PhD students and 180 MS students. Of these, 17 obtained their Doctorate degree and 25 obtained their Master degree that year.

Facilitating International Exchange

Since 2006, BIOTEC has established an "International Student Internship" program with various overseas academic institutes to host undergraduate and graduate students from these institutes on a regular basis. These students, specializing in biotechnology or life sciences, would work in BIOTEC research laboratories, some as part of an optional enrichment program, others as a course to earn academic credits. Overseas academic institutes in this program include Atma Jaya Catholic University (Indonesia, since 2006), Temasek Polytechnic (Singapore, since 2007), National Taiwan University (Taiwan, since 2008), Nanyang Polytechnic (Singapore, since 2009), University of Kent (UK, since 2009), University of Liverpool (UK, since 2010) and City University of Hong Kong (China, since 2012). Currently, all students, except those from the University of Liverpool, are from undergraduate levels. However, more graduate students are expected in the future. For example, BIOTEC is preparing to host graduate students from the National Taiwan University and Atma Jaya Catholic University, starting from 2013.

Besides formal arrangements with other academic institutes, BIOTEC also welcome individual students who apply independently to the centre. On average, BIOTEC hosts 40-50 foreign students a year, including a number of graduate



students. For instance, in 2012, the BIOTEC Fermentation and Biochemical Engineering Lab hosted one PhD student from the Slovak University of Technology in Bratislava for 9 months. Similarly, a PhD Student from Chiba University, Japan spent 3 months working in the BIOTEC Plant Physiology and Biochemistry Lab. In addition, the WHO (through its program for Tropical Diseases Research) and the Howard Hughes Medical Institute (HHMI) regularly dispatch undergraduate and graduate students interested in the field of malaria research to BIOTEC.

Since 2011, BIOTEC has been organizing an annual "Short Course in Biotechnology and Application" for undergraduate students from the Soon Chun Hyang University in South Korea. The 4-week course offers a comprehensive view of biotechnology in Thailand, and comprises of classroom lectures, laboratory practice and industry visits.

Developing Human Capital for ASEAN and Beyond

In 2001, BIOTEC set up a program called "Human Resource Development in Biotechnology for CLMV" which provided research fellowships for young scientists

from Cambodia, Laos, Myanmar and Vietnam to undergo research-based training in BIOTEC laboratories. Since then, the program has been expanded to benefit all developing countries in ASEAN and the Pacific Islands. It has been renamed "Human Resource Development in Biotechnology for Asia-Pacific" and now grants 10-15 fellowships each year, each lasting 3-6 months. The effectiveness of the program was validated recently in a survey conducted in 2012. Of the 124 program alumni, at least 34 went on to win prestigious graduate scholarships that allowed them to further their studies in countries like Austria, Germany, US and Canada. Alumni who return to their home institutes have made advancements in their careers, such as becoming the head of department or research lab. They have also kept in touch with BIOTEC and established collaborations.

BIOTEC has contributed to the early and mid-career development of young researchers in and outside of Thailand. It has set up a number of fellowship programs to support and nurture promising Thai and foreign researchers. Since 2005, it has given out 31 post-doctoral fellowships. Among these, eight went to foreign scientists from China, India, France, Korea, Nigeria, Australia, Sweden and Japan. Since 2007, BIOTEC has also participated in the TWAS-UNESCO Associateship Scheme. It is one of the Centers

"Through its human capital development initiatives and its active networking with international institutes, BIOTEC has become a hot-spot for experts from all over the world to visit and gather."

of Excellence to offer fellowships to foreign researchers from developing countries for training and fostering collaboration. In the past five years, BIOTEC hosted 13 overseas scientists under this scheme, from India, Iran, Nigeria, Mongolia and Pakistan.

Sharing Knowledge, Advancing ASEAN's Development

BIOTEC has actively facilitated the transfer of beneficial biotechnologies to other developing countries in the region. For example, under the Molecular Rice Breeding Program for the Mekong Region which was launched in 2004, BIOTEC's Rice Gene Discovery Unit promoted the use of marker aided selection into the rice breeding programs of countries in the Mekong region e.g. Laos, Cambodia and Myanmar. The program comprises of comprehensive hands-on training, and the sharing of genomic information (genetic data for several traits and the molecular markers for several

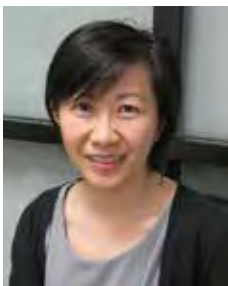
genes) and research facilities. Partners of the program include the Cambodian Agricultural Research and Development Institute (CARDI), Lao's National Agricultural and Forestry Institute (NAFRI), Myanmar's Department of Agricultural Research and Thailand's Ubon Ratchathani University. The first phase of the program was implemented from 2004 to 2006 with financial support from the Rockefeller Foundation, with a series of workshops held in Thailand to teach researchers from the various countries to conduct marker-assisted breeding on their own rice varieties. Since 2007, the program has been funded by the Generation Challenge Program (GCP) and allows researchers to continue the breeding development and conduct field trials. It has also incorporated graduate scholarships for young researchers from Myanmar, Laos and Cambodia to study at Kasetsart University's Faculty of Agriculture.

Since its inception, the program has trained 22 researchers from the various participating institutes and provided 10 graduate scholarships. It has enabled

Myanmar to develop two improved rice varieties (with improved cooking quality, aroma and salinity tolerance), which are being field tested and are close to being released. Laotian scientists were also able to develop three new improved varieties (with aroma, increased yield traits, improved cooking quality, submergence/ drought/blast tolerance), which are currently being tested in the field.

Through its human capital development initiatives and its active networking with international institutes, BIOTEC has become a hot-spot for experts from all over the world to visit and gather. Faculty members and researchers from France, the US, Japan and Sweden were among visiting scientists in the past years. Their visits, ranging from a short one-week stint, to sabbaticals lasting several months, allow for greater interactions among BIOTEC researchers and their peers from overseas. This fosters the exchange of fresh ideas and sharing of knowledge within the BIOTEC research community, helping to make Thailand a melting pot for researchers worldwide.

About the Author



Duangkaew Chongkachornphong is currently Director of International Collaboration and Public Relations, BIOTEC. After completing her master's degree in Environmental Engineering from the University of California, Berkeley, Duangkaew joined BIOTEC as a research staff. She was later recruited to establish international profile for BIOTEC in 1998. She was instrumental in setting up the Human Resource Development in Biotechnology for CLMV program in 2001. This program now provides a platform for capacity building activities for developing countries in the Asia-Pacific and has led to numerous collaborations between scientists in Asia. Her department manages BIOTEC multi-lateral collaborations, such as the ASEAN Sub Committee on Biotechnology, Generation Challenge Program, the Asia-Pacific International Molecular Biology Network (A-IMBN) and Asian Consortium for the Conservation and Sustainable Use of Microbial Resources (ACM), as well as bilateral collaborations with countries such as the members of ASEAN, Japan, the UK and Australia.