

A life of devotion, fighting disease

Realising a problem in medical treatment on serious infectious diseases, Dr Wanpen Chaicumpa has devoted her life to finding ways to treat and prevent infectious diseases. Here is the third of a five-part series to recognise her development on diagnostics that could help save the lives of poor people.

1999 Outstanding Scientist: Professor Dr Wanpen Chaicumpa.

BORN ON MAY 28, 1942, Professor Dr Wanpen Chaicumpa, a professor of microbiology and immunology, and presently an emeritus professor of the Faculty of Allied Health Sciences, Thammasat University, Rangsit Campus, graduated Doctor of Veterinary Medicine with Honours from Kasetsart University, Thailand, in 1965.

Thereafter, she went on to study microbiology at the University of Adelaide, Australia, under the Colombo Plan scholarship. Her hard earned PhD already pointed at her future inclination to combine microbiology with cutting edge knowledge in immunology.

In the following years, she complemented this knowledge base with course and private studies in molecular biology focused on tropical diseases. Since then, Wanpen has worked tirelessly for over 35 years at the Faculty of Tropical Medicine, Mahidol University, conducting basic science research to increase our understanding on the pathogenesis of common and serious infectious diseases and the characteristics of the causative organisms, and to find means to treat and prevent such diseases, mainly those affecting Thailand and other developing countries.

As many infectious diseases present similar clinical symptoms, but require different treatment, Wanpen started out to develop diagnostics that could help save the lives of poor people. This is easier said than done.

In order to fulfil her goal of developing the diagnostics that are highly specific and sensitive, rapid, inexpensive, suitable for field

conditions of developing areas and at the same time protecting the environment, she used modern technology at the time to develop specific reagents for detecting individual pathogens, their products, or the body responses to them, in the patients' body fluids and applied the reagents on the conventional platform that could be handled even by less experienced laboratory technicians in basic settings.

Diseases like cholera, typhoid, leptospirosis, parasitic infections endemic in Thailand such as gnathostomiasis (*payad tuo jeed*) and angiostrongyliasis (*payad samong akseb*), which used to depend solely on the doctor's clinical judgement can now be diagnosed at the patient's initial visit with high accuracy. This is saving lives, improving recovery chances, preventing spread of the diseases, reducing emergence of drug resistant mutants of the pathogens, and reducing health care costs from promptly initiating the right treatment due to rapid and accurate diagnosis which minimises hospital admissions.

Another area of Wanpen's research is development of non-needle, mucosal vaccines, again, for the target diseases that big pharmaceutical companies do not look at, as the potential markets are only in developing countries and the market sizes would not justify the expense of research and development, such as cholera. Other such vaccines for tropical or emerging diseases that afflict millions in developing countries are in her current research phase such as vaccines for leptospirosis, avian influenza, for both human and veterinary uses.

She and her colleagues are inventing therapeutic antibodies for deadly diseases which



Wanpen

drugs are not readily available such as bird flu, snakebites, diphtheria, pertussis, botulism, and anthrax, most of which are highly contagious and/or are biological weapons. This is overall for self-reliance of the country.

Besides conducting research, inventing and teaching, Wanpen is also advising and serving on numerous national and international bodies and institutions. She has been an editor-in-chief of the *Asian Pacific Journal of Allergy and Immunology* for 14 years. She is executive member of the Thailand National Research Council; senior researcher of the Thailand Research Fund; external reviewer of the International Centre for Diarrheal Diseases Research of Bangladesh; advisor to the World Health Organisation Special Programme, for example.

Wanpen retired from Mahidol University in 2002 and currently is an Emeritus Professor at the Faculty of Allied Health Sciences, Thammasat University, where she has set up a new molecular immunology and molecular microbiology at this new work place.

She is now teaching at the Master and PhD levels. For over 40 years, she has taught and supervised tropical and molecular immunology to countless students, many of whom are now professors of universities and leaders of research teams. Wanpen has received numerous Royal Decorations and awards for her service and outstanding work such as: the Knight Grand Cordon of the Most Noble Order of the White Elephant; Women in Science Special Honour Award from Unesco and L'Oréal in Paris; Asian Innovation Award from Brain Power of Asia and the *Far Eastern Economic Review*; Outstanding National Researcher Award; Outstanding National Invention Award; Outstanding Lecturer Awards from John A. Eakin Foundation, and Thailand University Faculty Senate.

Advertorial

Joining agriculture and science

Professor Somchart Soponronnarit has turned local research and development into commercial success. In the fourth of a five-part series The Nation showcases his achievements in renewable energy and the development of a fluidised bed paddy dryer and cyclonic rice husk furnace which has been used in Thailand and 10 other countries.

PROF SOMCHART SOPONRONNARIT, whose achievements link agriculture and science, became the first ever Thai to win a UNESCO Science Prize. In 2003 he was awarded this honour for his work on renewable energy and drying technology.

Somchart received an honours degree in agricultural engineering from Khon Kaen University in 1975; an M.Eng in agricultural system engineering and management from the Asian Institute of Technology in 1977; and a Dr.Eng in agricultural process engineering from the Ecole National Supérieure Agronomique de Toulouse, France in 1982. He joined King Mongkut University of Technology, Thon Buri after graduation as a faculty member in the School of Energy and Materials.

In 24 years of work, concentrating on research into renewable energy and drying technology, he has published more than 420 papers in national and international journals. His most successful project, in terms of application of research results, is the commercialisation of fluidised bed paddy dryers and cyclonic rice husk furnaces. Hundreds of these units are now in use around the world.

The fluidised bed grain dryer is used because of its potential for high-mois-

maize and soybean. Its energy consumption is relatively low, while grain quality is maintained.

The research and development of fluidised bed grain drying in Thailand. Several published papers describe an experimental batch dryer, a commercial continuous-flow dryer and a mathematical model of the fluidised bed grain drying system.

The cyclonic rice husk furnace has been fully commercialised. It was designed for the fluidised bed paddy dryer but its use is diverse. The furnace is cylindrical in shape. Rice husk is fed by air into the combustion chamber in



Somchart

a tangential direction with vortex rotation. Thermal efficiency of the furnace system is about 70 per cent. Analysis indicates that the payback period of the furnace is 1,200 hours when used in place of a diesel oil burner.

The success of the drying and renewable energy research is due to ongoing cooperation with experts in engineering and help from the private sector in developing prototypes of dryers and accessories for drying paddy. The benefit of the research will be to reduce costs and damage, add value to products, expand exports and reduce imports of agricultural and food products.

As a result of Somchart's research and the application of his renewable energy innovations, the Thai agricultural sector saves 30 million litres of diesel fuel and Bt200 million per year.

Advertorial

Local WEATHER

NORTH: Widespread thundershowers in the middle part. Low 23C. High 30C. Southwesterly winds 10-25kph.

NORTHEAST: Widespread thundershowers in many areas. Low 23C. High 31C. Southwesterly winds 15-30kph.

CENTRAL: Widespread thundershowers in the western part. Low 24C. High 31C. Southwesterly winds 15-30kph.

EAST COAST: Widespread thundershowers and isolated heavy rains along the coastal areas. Low 23C. High 31C. Southwesterly winds 20-35kph. Wave height 2 metres.

SOUTH: Scattered thundershowers. Low 23C. High 31C. Southwesterly winds 15-35kph. Wave height 1-2 metres.

BANGKOK: Widespread thundershowers and isolated heavy rains. Low 25C. High 31C. Southwesterly winds 15-30kph. Sunrise 6.02am. Sunset 6.46pm.