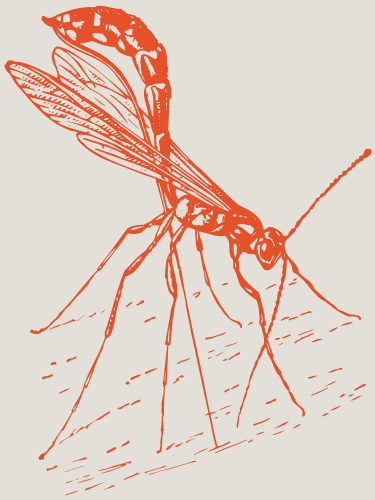
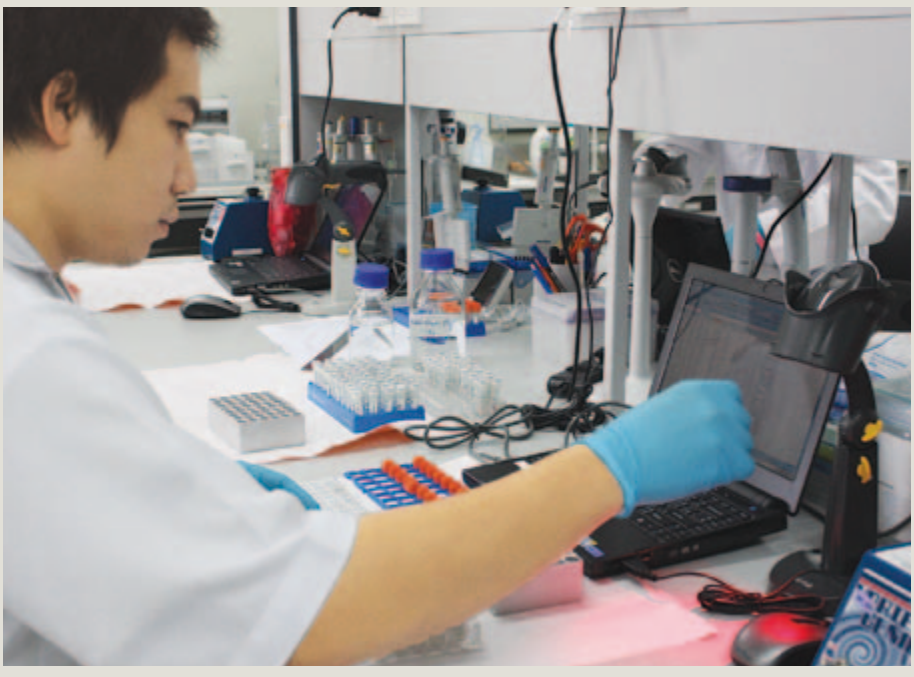
Faster sample preparation for tropical disease research



The Clinical Pharmacology Department in the Mahidol-Oxford Tropical Medicine Research Unit (MORU), Bangkok, has achieved huge time savings with its Freedom EVO® platform from Tecan, reducing time taken for sample preparation from five hours manually to just 20 minutes. This frees researchers for other studies and data analysis essential to advancing knowledge of how anti-malarial and anti-influenza drugs exert their effects.

The Mahidol-Oxford Tropical Medicine Unit (MORU) is a collaborative partnership between Mahidol University, Bangkok, Thailand, and the University of Oxford, UK, established with major funding from the Wellcome Trust in 1979. MORU aims to control infectious diseases in developing Asian and African countries, and to develop effective and practical diagnosis of malaria and other tropical diseases. MORU is based in the Faculty of Tropical Medicine at Mahidol University, and has three research departments focusing on malaria, microbiology and pharmacology. Most clinical studies take place at MORU field sites located close to rural communities affected by tropical diseases, and through collaborations in Thailand and other countries in Southeast Asia and Africa. Sample collection takes place at the study sites in the field, and samples are sent to Bangkok for analysis centrally.

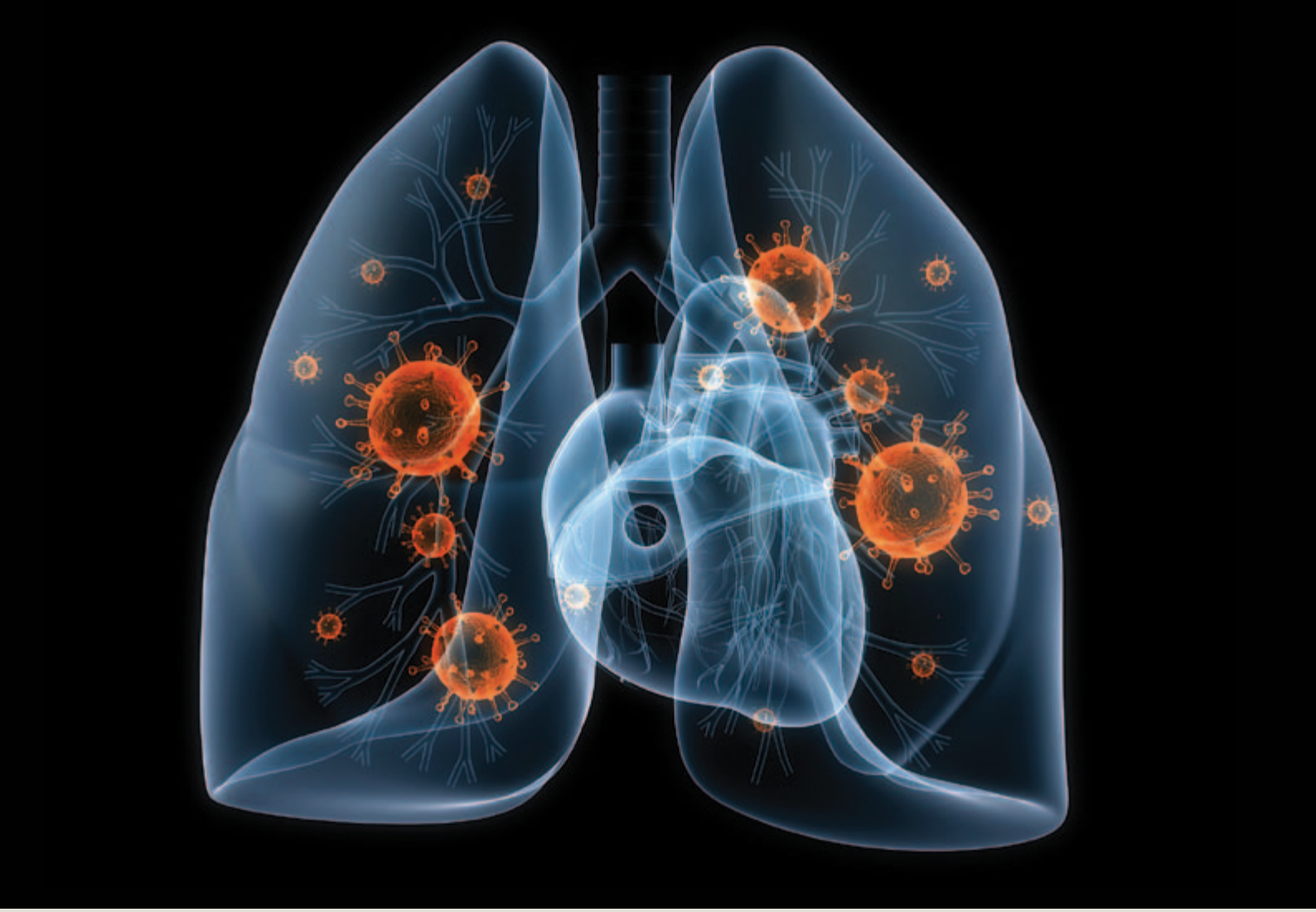
The Clinical Pharmacology Department, headed by Professor Niklas Lindegardh, specializes in bioanalysis of anti-infective drugs, and is one of the world's leading centers for evaluation of anti-malarial and anti-influenza drugs. Professor Lindegardh explained: "Our studies focus on malaria and influenza, and the main thrust of our research is the development of new methods and assays to quantify these drugs in biological fluids, using samples sent from MORU study sites throughout Southeast Asia. We also collaborate with clinical research groups in the worldwide anti-malarial resistance network (WWARN) – as well as other groups in Asia, Africa, USA and Europe – to study novel pharmaceutical agents, including pharmacokinetic data analysis to better understand the metabolism and effects of drugs *in vivo*."



MORU's Bangkok facility handles samples from across Southeast Asia.

Professor Lindegardh continued: "Much of our work involves sample preparation from blood, urine or plasma, and these samples have to be aliquoted and cleaned before they can be used for quantitative drug screening. Our Freedom EVO liquid handling workstation performs aliquoting and preparation of these samples, automating a range of preparation methods, such as solid-phase or liquid-liquid extractions and protein precipitations. We have been able to move from performing all these steps manually to automating everything on the Freedom EVO 200. The main benefit of automation is the phenomenal time saving, given our annual throughput of 25,000 samples in our laboratory. We typically run between 200 and 500 samples daily, and manual analyses that took around five hours on a limited number of samples, now take only 20 minutes for 96 samples using the automated system. This releases staff to do other experiments or data analysis while the system is running."

"We bought the Freedom EVO workstation just over a year ago, and currently use it exclusively for sample preparation. The platform is equipped with an eight-channel



Influenza virus spreads to the lungs and chest.

liquid handling (LiHa) arm, a MultiChannel Arm™ 96 (MCA 96) with a gripper, and a Te-VacS™ module for vacuum separation. It also has a cooling block, a sample mixer and a solid-phase extraction module, all of which are essential for sample preparation. Although this set-up is sufficient for our current throughput needs, we have the potential to upgrade the system to use barcode scanning and integrated detection instruments, should the need arise."

"We discussed our requirements thoroughly with Tecan Singapore before purchasing the Freedom EVO system, and the platform configuration was tailored to fulfill our exact requirements. Once the platform was installed, we worked for three days with engineers from Tecan Singapore to set up the platform and program the basic structure of the process scripts, and ensure everything was functioning correctly. Since then, we have been able to refine the scripts through additions and modifications, creating new processes and fine tuning the system to accommodate our sample preparation requirements. Overall, the platform is reliable and we are very happy with the support we receive from Tecan in Singapore; they always respond quickly to our needs," concluded Professor Lindegardh.

The MORU team in Bangkok.

For further information on MORU, visit **www.tropmedres.ac/home**

To find out more on Tecan's Freedom EVO workstations, visit **www.tecan.com/freedomevo**