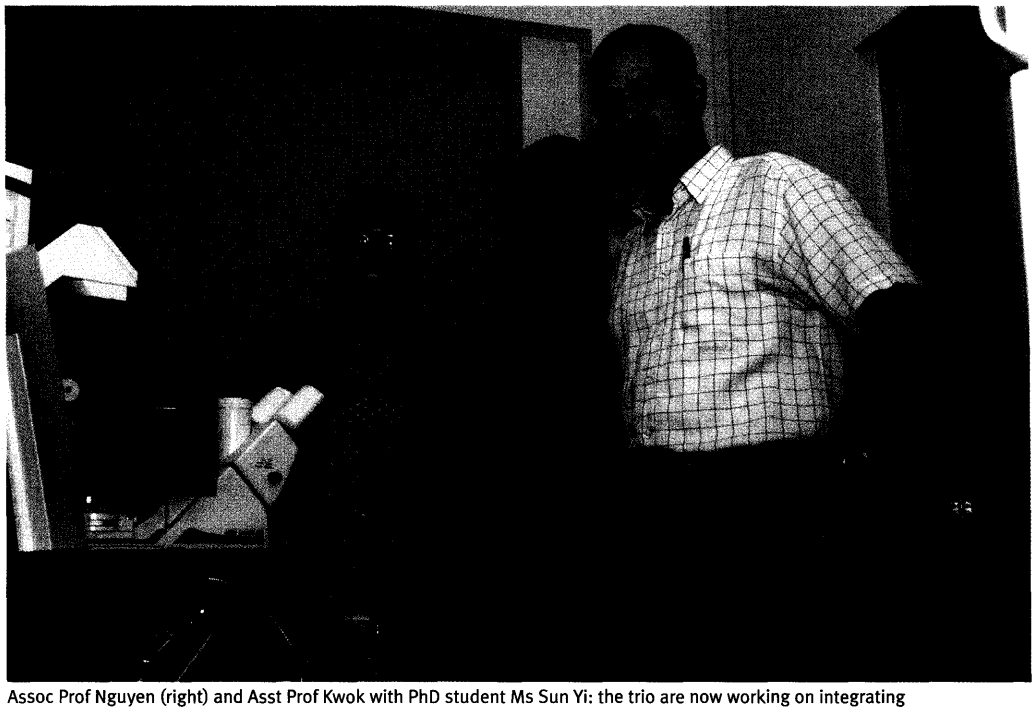
PCR Microchip by NTU Researchers a Faster and Better Method for DNA Amplification



Assoc Prof Nguyen (right) and Asst Prof Kwok with PhD student Ms Sun Yi: the trio are now working on integrating the microchip into a mobile system

Just as DNA samples are invisible to the naked eye but offer a tremendous amount of information about our genetic makeup, the miniature Polymerase Chain Reaction (PCR) device invented by NTU researchers is also a tiny wonder. PCR refers to a technique that can rapidly replicate DNA. The PCR microchip is able to replicate DNA not only within a shorter period of time but also at a cheaper cost and use less power. Unlike similar designs, this magnet-drive microchip has better temperature control, better ability to cope with high driving temperature and has no detectable leakage flows.

The invention of this microchip comes under a research project in collaboration with Health Science Authority (HSA). Assoc Prof Nguyen Nam Trung of School of Mechanical and Aerospace Engineering and Asst Prof Kwok Yien Chian of National Institute of Education are the two key figures of this invention.

Currently, the two researchers are working on integrating the microchip into a mobile system that will facilitate on-the-scene screenings of DNA samples. This is useful in police cases where mass DNA screening is required. The purpose of the system in such cases would be to isolate DNA samples of possible suspects from a large number of DNA samples for more detailed analysis at the HSA laboratory. This will cut down the waiting time required for DNA test results and increase the chances of nabbing the suspects before they make their getaways. It usually takes about a week for results to be ready.

The system will also play a very crucial role in body identification after natural disasters or tragedies. In fact, this project, which started in 2005, was initiated by HSA in the wake of the tsunami tragedy. The catastrophe, which took place on 26th December 2004, killed tens of thousands and left millions homeless in the countries it ravaged.

As with most disasters, speedy and correct identification of the dead is critical. One of the major concerns is the possibility that the dead bodies will cause epidemics. On the part of the victims' families, the mental suffering of losing their loved ones would be overwhelming and being able to see their dead family members given a proper burial would give them a sense of closure. Correct identification of the dead also has legal implications for inheritance and insurance that can impact on the victims' families and relatives.