Assoc Prof Ir Dr Abd Rahim Abu Talib with the first multipurpose disposable safety syringe and vacuum blood tube in Malaysia.

Ideas that are industry-driven

AS a leading research and development university in Malaysia, Universiti Putra Malaysia (UPM) has always been at the forefront of innovation.

UPM works closely with government bodies and private entities to challenge paradigms and create new solutions for existing industry challenges.

Greater heights

Researchers from UPM, led by Assoc Prof Dr Norhisham Misron from the Faculty of Engineering in collaboration with the Malaysian Oil Palm Board, invented the e-cutter, an electronic cutter that can harvest oil palm brunches and prune fronds on trees as high as 25 feet (8m).

The e-cutter is powered by a generator that is lightweight, efficient and is able to reduce manpower in harvesting and maintenance processes.

The e-cutter complements existing oil palm harvesting tools and methods. The device is an improvised version of its predecessor, a motorised palm oil palm-cutter known as "cantas", replacing mechanical tools with electronic devices that are more economic and environmentally friendly.

It is poised to be commercialised by JWR Technology (M) Sdn Bhd with the signing of a Memorandum of Understanding in the near future.

Partnering with UPM, Malaysia Innovation Hub has been actively involved in the development of new innovations in the palm oil industry.

One such innovation is the oil palm harvester with anti-bruising collection system. Built similar to a mini crane, this machine helps to ease the harvest of oil palm from taller trees.

Safe blood

A group of researchers led by Assoc Prof Ir Dr Abd Rahim Abu Talib from the Department of Aerospace Engineering successfully developed a multipurpose disposable safety syringe and a non-penetrative vacuum blood container or VacTube.

Both technologies are related to one another where both can be used in transporting and storing fluids, such as blood for lab purposes, medical and veterinarian use, and a host of other applications.

The use of the safety syringe prevents reusability, reducing the incidence of microbial contaminations and infectious diseases caused by syringe misuse. The needle can be permanently disengaged from the syringe to prevent syringe reuse.

On the other hand, the VacTube is a innovation that uses vacuum technology to draw blood into the tube while releasing air without the need of a needle.

Both the multipurpose disposable safety syringe and the vacuum blood tube are not produced locally and have to be imported.

The market size for the safety syringe in Malaysia is estimated to be between three and five million units a year. In the Asean region, it is estimated to be between 10 and 30 million units annually.

For the tube, the market size is estimated to be between five and eight million tubes a year and 30 and 50 million tubes a year in the Asean region.

Both the innovations were part of the Master of Innovation and Engineering Design programme under the Faculty of Engineering in UPM and have been acquired by Selia-Tek Industries Sdn Bhd through patent purchase.

Deeper waters

Toxicity tests are conducted to identify the level of acute or chronic toxicity in chemicals, drugs and pollution.

Dr Syahida Ahmad and her research team from the Department of Biochemistry, Faculty of Biotechnology and Biomolecular Sciences have succeeded in developing a time-efficient toxicity test kit using embryos of *Danio rerio* or the Zebra Danio fish known as the Danio Assay Kit – an alternative to other toxicity tests using conventional animal models.

"The embryonic development of the Zebra Danio is similar to that of humans but the difference is the time of embryo development, which is 50 times faster and occurs outside of the mother's body. Hence, embryo assessment can be conducted without harming the mother or the embryos," she says.

With this ability, scientists can study the effects of chemicals, drugs and air pollution on humans from the foetus using Zebra Danio embryos as animal models with fast and accurate results.

What makes the Danio Assay Kit stand out from the rest is in the Zebra Danio embryos themselves that are bioengineered to emit light.

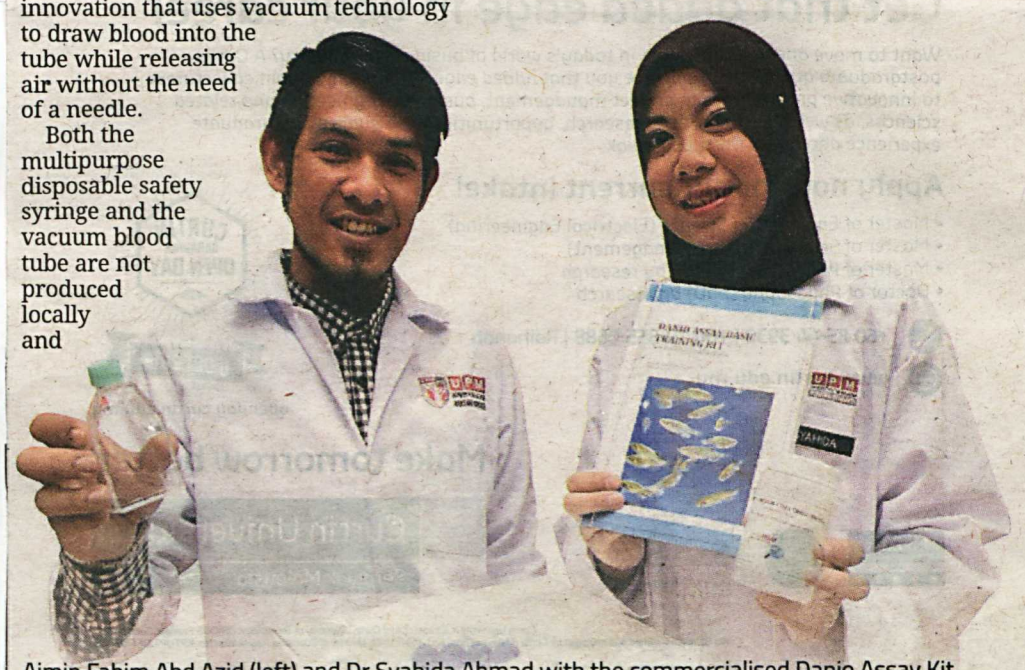
The light-emitting gene from bioluminescent bacteria was isolated and inserted into the Zebra Danio genetic make-up to produce a transgenic fishes.

The luminescent property of these embryos allows scientists to run the toxicity test efficiently and produce accurate results.

Results can be obtained in just three days compared to conventional methods that may take up to 14 days, which leads to reduced research cost.

The Danio Assay Kit is now a commercial product under Danio Assay Laboratories Sdn Bhd, a start-up under the Innohub UPM programme.

■ For more information, visit *www.sciencepark.upm.edu.my*.



Aimin Fahim Abd Azid (left) and Dr Syahida Ahmad with the commercialised Danio Assay Kit.