ST PHOTO: MARK CHEONG

(From left) Dr Gordon Ku with a portable dialysis machine, Assistant Professor Ernest Chua with a dehumidifying membrane that can reduce air-conditioning bills, Professor Mary Chan with contact lenses utilising an anti-bacterial substance she invented, Ms Yeung Tsz Tsam with larva-eating robotic fish and Mr Lim Ding Yan with the shoulder rehabilitative device which he helped create.

Creative technologies

Local inventors have come up with products to fight dengue, kill super bugs and reduce air-con bills

Benson Ang

A portable dialysis machine.

A robotic fish that devours mosquito larvae.

An anti-bacterial solution used in contact lenses and pet shampoo.

What do these three things have in common? Answer: They are all brainwaves of Singaporeans.

And going by figures from the Intellectual Property Office of Singapore (Ipos), there is a growing crop of inventions by local talent.

Over the past decade, Ipos has seen a 78 per cent jump in the number of patents filed by locals: from 641 in 2004 to 1,143 last year.

A patent is a right granted to an invention's owner that prevents others from making, using, importing or selling the invention without permission.

The patents granted in Singapore were largely for inventions related to the chemistry, physics, electrical and medical fields.

Mr Simon Seow, Ipos' group director for registry of patents, designs and plant varieties protection, credits the "healthy increase" in patent filings to Singapore's strong economic growth, innovation-driven economy and a growing awareness that protecting and commercialising intellectual property is a key driver of business performance and growth.

Local tertiary institutions, he notes, were among the groups which filed the biggest number of applications for patents in the last three years.

For instance, the National University of Singapore (NUS) has filed more than 3,500 patents to date.

Says NUS provost Professor Tan Eng Chye: "We carry out curiosity-driven and basic research across a broad range of fields but, at the same time, have a strong focus on commercialising and applying our research discoveries."

At Nanyang Polytechnic, registrar Thambyrajah T. says: "We actively foster the spirit of innovation and enterprise among our students, guided by staff who are constantly encouraged to break new ground in research, pedagogy and inventions."

At Republic Polytechnic, students attend talks and workshops where they can speak to and learn from established entrepreneurs and inventors.

The polytechnic also has a mentorship scheme which pairs students with its lecturers to better develop student ideas.

Indeed, when SundayLife! asked the tertiary institutions for some recent inventions, it received more than 35 submissions from nine institutions.

Some projects were ambitious, such as launching a student-built satellite into space.

Others were quirky, such as a device that uses brain signals to control household appliances such as fans and lamps.

Many inventions were medical-related or aimed at making life easier for the elderly and people with disabilities, and almost all were team efforts.

While there might be a proliferation of inventions, some inventors warn that the road to success can be a long, hard slog.

Says Mr Neo Kok Beng, 49, a seasoned inventor who is part of the team behind a portable kidney dialysis device which is slated to hit the market in 2017: "It's not like you shout 'Eureka' and instantly become a millionaire."

Adds the adjunct associate professor at the NUS Business School, who is from the team behind a 3-D printer that took the crowd-funding world by storm last year: "You have to come up with an exciting concept, develop a working prototype and build a passionate team to commercialise your invention.

"And if it is a medical-related invention, you will also have to send it for clinical trials and safety checks, which can take many years."

Adds Mr Caleb Tan, 37, a lecturer at Republic Polytechnic's school of engineering who developed a virtual fitting booth in 2012 where shoppers can try on clothes without having to undress: "Even after the prototype is ready, businesses might choose not to adopt it. Should that happen, all we can do is try and apply our inventions to other purposes or move on to other ideas."

One thing is for sure, though: Singaporeans are definitely thinking out of the box.

Says Dr Kirpal Singh, associate professor of English literature at Singapore Management University: "We often think of artistic or cultural works as products of creativity. But scientific inventions also come from the creative realm."

The 65-year-old was re-elected last week as vice-president of the American Creativity Association in Philadelphia.

The non-profit organisation promotes the development of personal and professional creativity in the United States and several other countries.

Dr Singh adds: "Inventions require inventors to look at the world in new ways. Ultimately, inventions are about bettering people's lives."

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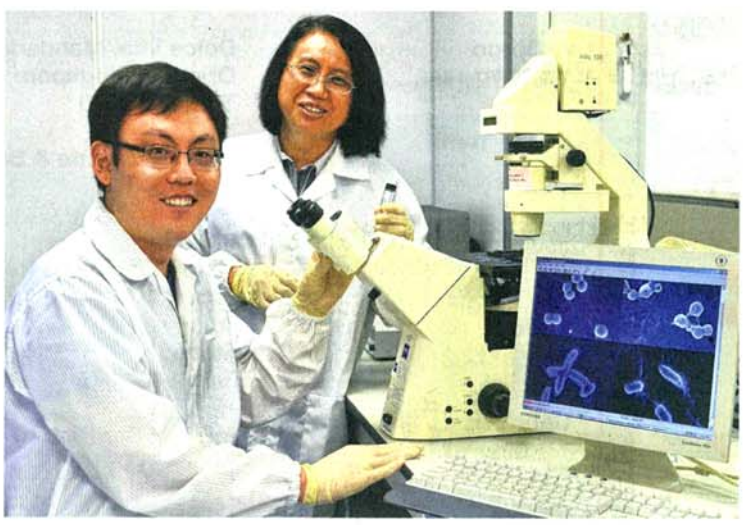
NEW WAY TO KILL BACTERIA



PHOTOS: NANYANG TECHNOLOGICAL UNIVERSITY, MARK CHEONG

Prof Mary Chan and PhD student Li Peng (both left), who has since graduated, are part of a team which came up with a new way to kill bacteria. This invention is being developed to make anti-bacterial contact lenses (above) and pet shampoo.

Antibotics are routinely used to kill bacteria. But what happens when these microbes become resistant to existing drugs?

Professor Mary Chan, 50, from Nanyang Technological University (NTU), has found a new way to kill them.

The scientist at NTU's chemical and biomedical engineering school has invented a solution that she says can wipe out even the strongest bacteria.

Most antibiotics destroy bacteria by damaging their DNA and preventing them from replicating.

While this works most of the time, some bacteria can mutate and develop drug-fighting capabilities.

Enter Prof Chan's solution, which comprises compounds that kill bacteria by rupturing their cell walls.

The invention has been shown to destroy 99 per cent of the bacteria it comes in contact with.

A patent for the substance – called chitosan hydrogel derivatives as a coating agent with broad spectrum of anti-microbial activities – was granted in April by the United States Patent and Trademark Office.

It is being developed for commercial use by two companies here.

One, contact lens manufacturer Clearlab, is using it to make anti-bacterial contact lenses, which are expected to be ready in two years.

The other, home-grown research and manufacturing company Areteon, is using it as an ingredient to make pet shampoo for dogs and cats.

The shampoo, to be launched next year, will be sold through vets here and exported to other Asian countries, as well as to Europe and the United States.

Mr Robin Low, 66, Areteon's deputy chief executive, says: "When using shampoos containing antibiotics, there is a chance for the animal to develop a resistance to the drug. We were drawn to Prof Chan's invention because it will not cause resistance."

He adds: "Our trials in China and Taiwan also show that the shampoo is effective in treating skin ailments."

Prof Chan, who spent about three years on the project from 2008, says she was motivated by the rise of antibiotic-resistant bacteria in the last decade.

"These days, we hear about 'super bugs' which can fight off many types of antibiotics. I wanted to use a different method to kill bacteria cells," she explains.

"This, I believe, can be an alternative form of preventing bacterial infections."