Dynamic professors with the golden touch

NTU duo develop and take unique stents for preventing heart attacks to clinical trials

Nanyang Technological University (NTU) dons Freddy Boey and Subbu Vadakkan are at the forefront in business suits as much as they are in lab coats. Between them, the materials science engineers have co-founded three companies and separately developed and licensed a number of products. Their biggest, and riskiest, venture to date has been launching dissolving stents – tubes used to keep blood vessels open to prevent a heart attack. The dissolving stent is unique because, unlike what is currently available in the market, they leave no foreign body in the blood vessel, allow faster healing and cut out the risk of another clumping.

The potential market for this technology is huge. Nearly 18 million people die every year of cardiovascular disease globally. So, with a US$12 million (S$16 million) investment from American and local investors, the two founded biotechnology firm Amaranth Medical to take the device to clinical trials.

Four years on, Professor Boey admits that the firm, with offices in Silicon Valley and Singapore, has struggled to complete animal trials and iron out kinks so it could move towards testing the stent on patients. “Given the current bloodstream for biotech start-ups in the United States, it’s a minor miracle Amaranth has survived,” said Prof Boey, 54, chair of the School of Materials Science and Engineering.

While awaiting Amaranth’s fate, the pair have ventured into another market. Working with doctors in Mumbai, India, they have come up with what they believe is a simpler – a stent coated with two drugs, rather than one that is generally the case.

The dual drug-coating stent, as it is called, is a metal stent coated with drug-free biodegradable polymers that release two drugs: one to prevent scarring and the other to thin blood clots.

Prof Boey explained that they chose to partner in India because the patent laws allowed for certain drugs to be used without landing them in court for infringement. As the drugs used have already been approved, it’s easier to get the green light to test the new stent in clinical trials. There has been relative straightforwardness.

Dr Subbu Vadakkan, a senior interventional cardiologist at the Asian Heart Institute in Mumbai, said results currently used are prone to cause clots, so “to facilitate safety we came up with this idea.”

Clinical trials of the new stent should begin in April. Hopefully it may be in use in a few years.

Prof Boey and Professor Subbu are putting their materials science expertise to use in areas other than stents though. “Every time I talk to a doctor, I get another idea,” said Prof Boey, who recently started a new company to market an improved drain design for use in kidney operations, which he says is his “personal passion”.

US company Insight Medical has licensed the technology from Florida hospital.

And a clamp, disposable tissue retractor with hooks to keep a wound open during surgery is already bringing in money for NTU and Prof Boey.

US company Insight Medical has licensed the invention and began selling it last year. Chief operating officer Larry Miller reports that more than 50,000 units in 25 countries have been sold and he is looking to triple sales next year.

Explaining why they work together well, Prof Subbu, associate chair of research at the NTU school, said: “Freddy is the big picture person, so he usually has conceptual ideas. I am detail-oriented and help to reduce concepts to processes in a realistic manner.”

“Without Freddy’s positive outlook, it would be difficult to get things started. On the other hand, I am a reality check on some of the wilder ideas.”

Prof Boey added: “It’s been a steep learning curve, but our experiences have taught us to diversify. You can’t just do Nobel Prize-winning research, you’ve got to think smaller too.”