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# The up-and-coming Siogen

PATRICK GOH/THE EDGE

BY Aishah Mustapha

Sitting in his office, Siogen Biotech co-founder and managing director Shermal Perera imparts sound advice to biotechnology entrepreneurs as the interview draws to an end.

"If you are thinking of doing biotech, you must think global from day one. If you think any less than that, your company's valuation won't be much. Invariably, you would have to value your company sooner or later if you want to grow," he says.

Indeed, this is what Perera did when he founded Siogen in Malaysia in 2008 with a good manufacturing practice (GMP) facility in Germany and an R&D outfit in Scotland. He says he was lucky to find a gem when he got in touch with ex-colleague Zoser Salama back in 2007.

The gem was a series of patented drug delivery technologies with a collective 22 years of R&D behind it that has yet to be commercialised. Salama was the inventor and the driving force in what is now called the Siosomes family of nano drug delivery systems — a flagship product of Siogen. He has more than 20 patents to his name.

Amid heavy government initiatives to push biotechnology, Perera started a company with Salama and managed to find an angel investor in Andrew Porter, a professor of biotechnology at the University of Aberdeen, Scotland. Together, they raised around US\$2 million in paid-up capital, with RM2.5 million coming from Malaysian Biotech Corp's seed grant for BioNexus companies.

"When I came into the picture, the technology wasn't commercialised. It was more R&D. Some pre-commercialisation work needed to be done. Based on our molecular structure, we have 30 different Siosomes in the family. Two are ready to go to market. We have another 28 to commercialise," says Perera.

He uses an analogy to explain a drug delivery system: "A normal drug delivery system is like a vehicle into which drugs can go, like cars. The problem is that one car cannot be adapted for all the drugs you have in the market. Each drug is different. For example, chemotherapy drugs are chemical compounds and insulin is a protein compound. A vehicle has many different criteria and characteristics to meet. We have 30 Siosomes, or 30 different cars."

According to the US Food and Drug Administration and the European Agency for the Evaluation of Medicinal Products, if you take a drug and put it in a vehicle, the whole thing is considered a drug. "So now, you have to take it from zero again and out to market. You have to do studies, pre-clinical and clinical trials," explains Perera.

Last May, Siogen signed a collaboration deal with Veeda Clinical Research, a contract research organisation to deliver oncology drugs with Siosomes. The first chosen is a famous chemo-



Perera: Imagine taking an insulin tablet instead of injecting yourself every day. That's the paradigm shift I'm talking about.

therapy drug called Doxorubicin on which pre-clinical trials are set to begin next year.

## A paradigm shift

It goes without saying that every entrepreneur is excited about his product. But Perera says Siosomes are not run-of-the-mill products. They are part of a paradigm shift that was envisioned years ago by the pharmaceutical industry.

"What if I tell you right now that I can give you a Panadol that lasts for three days? Won't you take that instead of one every four hours? You see, 95% of Panadol breaks down in your stomach. So if you've got a headache, only 5% of it goes to

your headache. The rest is excreted."

Most people would prefer a Panadol where 60% of the drug goes to the site of action instead of 5%. That's money for drug companies because their costs can decrease as they do not have to push a lot more drugs. And too much in your system can cause toxicity. "I'll tell you this: every drug has got a problem. And every drug can be improved. What we are providing is that improvement," says Perera.

Siogen has started a project in the US with an American company to look at delivering insulin in a tablet for diabetic dogs.

"That's the holy grail itself. Insulin is so un-

stable that if you put it on the table for three days, it breaks down. Imagine taking an insulin tablet instead of injecting yourself every day. That's the paradigm shift I'm talking about. It's allowing people to take smaller amounts of drugs, less frequently and thereby reducing toxicity," says Perera.

But Siosomes are not brand-new technologies, he adds. In fact, he feels it is the second generation to a promise of a technology called Liposomes years ago.

"Our technology is not brand new. The dream came with a technology called Lipo-

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# Company invited to set up Siosome facility in three American states

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somes. They have been out there for 35 years. But Liposomes only came out with five drugs because they are unstable. Siosomes however sit in a far more robust structure compared to Liposomes. The key difference is that Liposomes use carbon as their central atom but Siosomes use silicon as a central atom. Silicon is more stable and the chemistry is a lot easier," Perera explains.

Currently, Siosome tests have produced better results than Liposomes. Its drug encapsulation efficiency is around 60% to 80%, almost 10 times that of Liposomes. The higher encapsulation rate means there are fewer lipids in the body, which means the liver is less taxed.

In the process of characterising the remaining 28 Siosomes, Perera has become quite excited

about the development of one of them — Siosomes with antibody characteristics.

This, he says, means that drugs encapsulated with the Siosomes will be delivered quickly to the site of action as soon as it goes into the bloodstream. The human body produces up to  $10^{12}$  antibodies for specific illnesses and diseases. The drug will be able to magnetise itself to the site of action because cells will recognise the antibody as their own as soon as it comes from the bloodstream. One complete blood circulation pumped from the heart that goes to all the cells and returns typically takes around 20 seconds.

"If I coat it with an antibody for liver cells, it will go straight to the liver cells. That's taking 80% to 90% of the drug straight to the tissue to treat, let's say, liver cancer," says Perera.

He has been invited to set up a Siosomes facility in three American states as part of the biotechnology ecosystem. These deals came from having a booth at the 2010 BIO International Convention in Chicago last May, something Perera recommends all Malaysian entrepreneurs do.

"We are talking to North Carolina, New Jersey and Massachusetts. We will provide Siosomes at cost value to anyone who wants to manufacture for university R&D. In return, I get a GMP facility, proof of concept and a clinical trial facility."

Perera feels this arrangement will work well as it opens up the US market for the company. "That's what Liposomes did. They had a lot of people doing trials on it. Our model is to create strategic places where they can try Siosomes out.

I can tell you that only one out of 10,000 drugs make it to market. We can help the drugs having problems which can't be delivered properly."

As part of the company's strategy, Perera is asking for equity participation in the US facilities in order to grow. Siosome's trademark is already registered in 60 countries.

Perera is hopeful that Siogen will close a few deals with pharmaceutical and cosmetics companies based in the US, Brazil, France and China by the end of the year. The characterisation of the remaining 28 Siosomes is also expected to be completed in six months' time.

All in all, things are looking up for Siogen. As the young company gains ground, it cannot be denied that biotechnology companies need to start with a global mindset or face extinction one day. ■