Connecting the digital and biological worlds

Creator of first artificial life form highlights the pull of synthetic biology

To a generation which grew up with computers, the field of synthetic biology—creating artificial life forms—is a story they can relate to, said American geneticist Craig Venter.

After all, synthetic biology is the “ultimate interface” between the biological and digital worlds as it converts lines of computer code into strands of DNA, he noted.

New species of bacteria or algae, for instance, could be created by writing a genetic code from scratch. Dr Venter, who was one of the first to sequence the human genome, and also created the world’s first artificial life form—a bacterium—in 2010, was speaking to a rapt young audience at yesterday’s Molecular Frontiers Symposium at Nanyang Technological University (NTU).

More than 500 junior college and polytechnic students were attending the two-day event to listen to—and quiz—top scientists such as Dr Venter and Nobel laureates Barry Sharpless and Harold Kroto.

Getting young people interested in science is not difficult if the subject is taught in the right way, Dr Venter said.

“I think the old view of science kept me from being interested in science. I was a horrible student because science was taught as rote memorisation.”

But it can better attract young scientists if taught in terms of problem-solving instead, he added.

The symposium is organised by NTU and the Molecular Frontiers Foundation in Stockholm, which promotes awareness of molecular science internationally.

The foundation is establishing an Asian headquarters in NTU which will work with schools and the Government to attract talent to research.

Students in Asia have “a hunger to learn” which is greater than in Western countries, said foundation head Bengt Nordén.

Synthetic biology will also be one focus of NTU’s upcoming medical school as its applications include creating vaccines within hours instead of months, and personalising drugs for individuals.

The university is collaborating with the University of California, Berkeley, and Imperial College London in that field, said NTU president Bertil Andersson.

Set to open next year, the Lee Kong Chian School of Medicine is a collaboration between NTU and Imperial.

Janice Heng

ACCUSED OF PLAYING GOD

When Dr Craig Venter’s team created the first artificial life form in 2010, they faced accusations of playing God.

The American geneticist’s team produced genetic code from scratch, then transplanted it into a bacterial cell to create a new organism.

The research could lead to designer life forms such as algae that can convert waste into energy or synthesise food.

But the work has also attracted criticism and fear.

Some said the scientists were playing God by trying to bring new forms of life into the world. But Dr Venter sees such fears as founded more in media sensationalism than fact.

Scientists need to communicate better with the public to deal with such “societal challenges” to research, Dr Venter, 66, said.

In his talk at the Molecular Frontiers Symposium yesterday, he noted that ethics committees have not found his work objectionable.

His team had even commissioned a biotechnical review of their research in 1999 before they started.

After the synthetic cell’s creation, a study by US President Barack Obama’s bioethics commission also gave their work the green light.

But public fears and misconceptions can persist—not helped by the media’s tendency to give “fur-out or hirene” viewpoints more weight than they deserve, said Dr Venter.

Controversies aside, basic communication between scientists and laymen can be improved.

“My view is that every scientist has an obligation to speak to the public about what they do.”