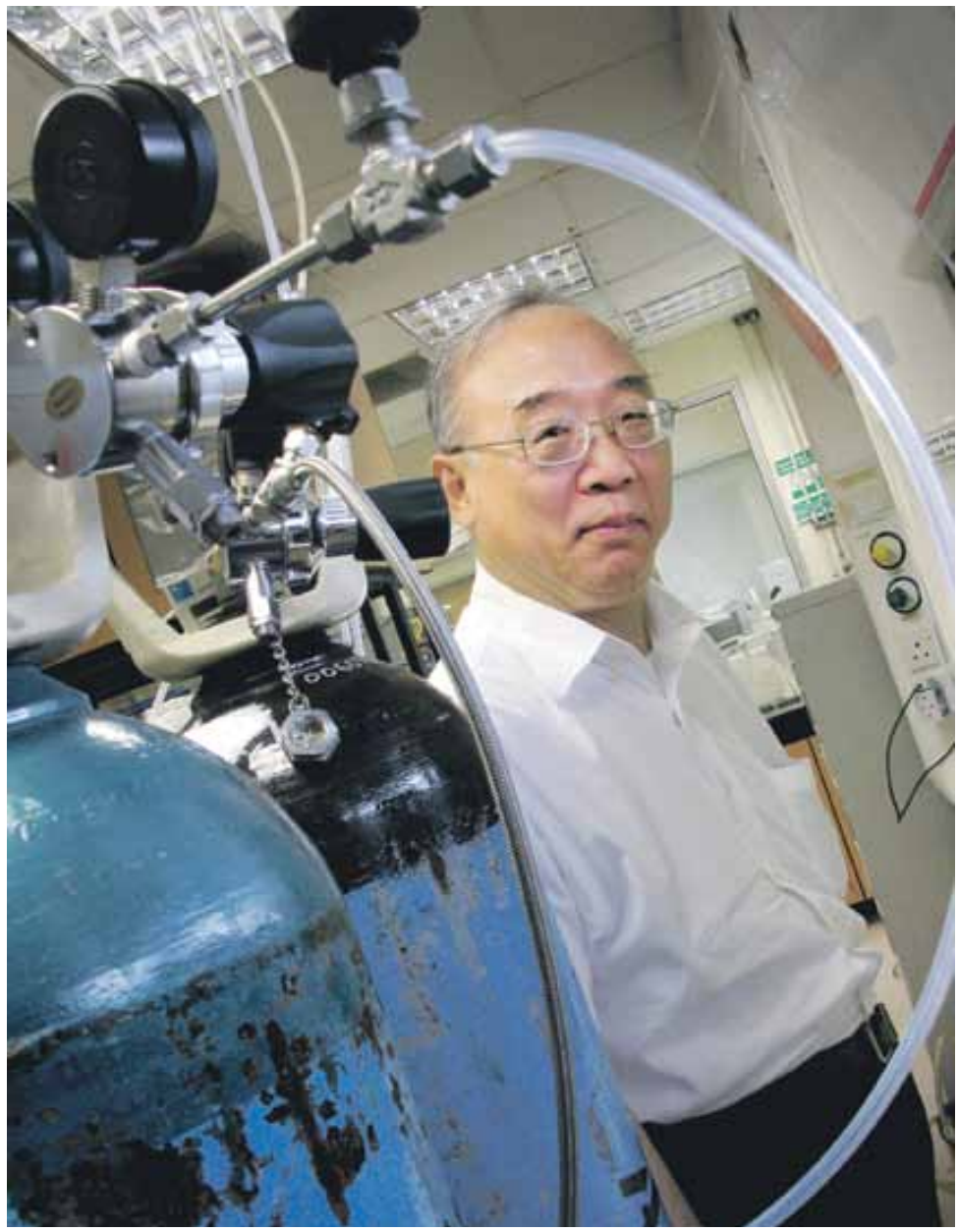
‘Singapore is so important right now’

He doesn’t have a mobile phone, but he has 34 US patents. ‘You have to be a little crazy,’ shrugs NUS’ Neal Chung

PUSHING THE BOUNDARIES
SPOTLIGHT ON NRF SCIENTISTS

In the third of a series of interviews with scientists under the National Research Foundation umbrella, PAUL GILFEATHER *meets Professor Neal Chung, an international name in membrane science and engineering.*



SION TOUHIG

SINGAPORE — Neal Chung admits he is a touch eccentric. But for all his quirks, he is the first person ever to secure *two* multi-million-dollar grants from the National Research Foundation for renewable energy and water recycling.

That gives you some idea of the high regard in which he is held among those bankrolling Singapore’s drive to force the next big scientific breakthrough.

Unorthodox in the nicest possible sense of the word, the Taiwanese scientist, who spends 14 hours every single day of every week in his lab, is recognised as one of the leaders in the field of clean water and energy technology — but admits to still harbouring huge ambitions to win awards on the world stage.

Just based on his work ethic, the National University of Singapore scientist would deserve it. What comes across from this softly-spoken, unassuming man is a dedication to progress bordering on the obsessive.

He told TODAY: “To be a good researcher you have to be a little bit crazy. For me, it’s also important to lead a simple life without any distractions. It allows me to focus.

“I have been in Singapore for 16 years and in that time I’ve never been to the Zoo, Bird Park or even seen a movie. I don’t even have a handphone. Nobody can bother me.”

BIBLICAL LESSONS IN BRAINWORK

A devout Christian, Prof Chung, who was recently made a provost chair of the university’s Chemical and Environmental Engineering Department, has spent the past 20 years committing to memory huge sections of the Bible — which gives us insight into his desire to fine-tune his brain in the art of concentration.

The pioneer, who returns to Taiwan once a year to visit his 90-year-old mother, revealed that despite the huge advances he has made in water recycling and clean energy technology, he regards memorising all 13 chapters of the Book of Hebrew as his biggest achievement.

He said: “I am a Christian and every day I read the Bible and then I meditate. I have memorised a quarter of the New Testament.

“When I was around 40, I tried to memorise the first chapter of Hebrews. It took me one whole week and from that point I decided to spend every day learning the New Testament.

“I am not particularly smart but I know that knowledge comes through time and hard work.”

Prof Chung spent 15 years working in the commercial sector in America before taking up his teaching post at NUS. He has developed around 70 patents for filtering water and several have been commercialised.

The 60-year-old inventor is also a one-man industry when it comes to writing academic papers in his chosen field of research. His efforts have propelled Singapore to the top of the heap in sustainable technologies.

And for him, this period has proved the most rewarding of his career.

“Being a professor is the greatest job in the world,” he said.

“Over the past 16 years, we have moved to the front of the world because of our tremendous effort.

> Now is Asia’s time. In the next 20 years you will see a lot of Nobel Prize winners coming from Asia.
>
> **Professor Neal Chung**

“I am a professor and the biggest joy in my life is giving knowledge to a student and seeing them change to the point where I learn from them. I have the chance to change someone’s life.

“I am maybe not the best teacher but I try and make the subject exciting. I spent 15 years in the industry, so I think I speak differently to other professors.

“Having worked in the real world, I understand the harshness of life and that makes me keen to see my students survive. I always urge my students to go on to take their PhD because it will be those with the greatest knowledge who succeed.”

CLEAN ENERGY

Prof Chung is clearly very proud of securing two Competitive Research Programme grants. The first was in 2007 to produce new materials for clean energy gas, and the second was in 2010 for wastewater treatments. Both are worth millions of dollars.

“I have two projects. With water we talk about recycling municipal water. We are trying and find a new approach,” he said.

“The major problem is energy. Every country, since oil prices went up in 2008, is looking for low energy separation technology. The current technology is mature but still energy intensive.

“Natural gas is also important. At the moment natural gas has a lot of CO_2, but we want to remove the CO_2 so the energy efficiency will increase.

“The other possibility for clean energy is hydrogen. Hydrogen is the most clean energy, because when you burn it you get water. When you make hydrogen, you have a by-product which is CO_2, so you have to remove the CO_2. You can capture CO_2 and you can get pure hydrogen. So the advantage is you separate hydrogen for the useful part and you capture CO_2 for environmental control. One-step separation.

“A membrane is used for water recycling and can be used for energy and fuel cells. We produce special membranes where the pore size determines rejection of bigger particles. This technology is also used for artificial kidneys.

“We believe we are world leaders in removing CO_2. We are in the top three in the world.”

Prof Chung proudly shows me a sheet of bumpy plastic. This is the all-important membrane which filters clean water. He also produces hollow membrane fibres of different sizes. They look like simple devices, but in a world where sustainable living is the future, the technology created in his lab today will come to play such an important part for future generations.

“We hope to really make something happen,” he told me. “Singapore is now so important in the world map. We have come to Singapore for the opportunity and to maximise our potential. Singapore is willing to put money into this kind of research. Without coming to Singapore I could not have accomplished so much.

“Britain and America has done this in the past. Now is Asia’s time. In the next 20 years you will see a lot of Nobel Prize winners coming from Asia.

“You can buy technology from outside, but you must move the technology to Singapore in order to create the next generation. If the technology belongs to you, you can create second-generation technology. If you just buy you will never improve. You want to move the technology to Singapore — and we will be the future.”