Q&A

Chang-Hwan Choi, a nanoengineer at the Stevens Institute of Technology in Hoboken, New Jersey, received a 2010 Young Investigator Program award from the US Office of Naval Research (ONR) for his design of anti-corrosion surfaces that will make Navy vessels more durable.

What sparked your initial interest in engineering?
Throughout my youth, I was interested in designing cars and planes. While I was at Seoul National University, there was a popular television programme about an Air Force pilot. It inspired me to focus my interests on planes and gain acceptance into the aerospace engineering department at my university.

Did you explore opportunities in foreign countries?
Yes. To satisfy my military service requirement, I earned my masters at Seoul University while working for the Korea Aerospace Research Institute. To gain the international experience I thought I needed to pursue aerospace-training opportunities abroad, I became a lecturer in a Korean-government overseas volunteer programme. I lectured on Korean languages and computer science in Thailand, which gave me confidence that I would do well in other countries.

How did you move into nanoscience?
After my lecturing service, I discovered that aerospace-engineering schools in the United States were shrinking their programmes. So, I decided to switch gears and apply to schools with PhDs in micro- and nanoscale systems, because interest in these areas was booming. I gained admission to four US schools, but I wanted to work with Kenneth Breuer, a fluid-mechanics researcher who had been developing microscale engines for satellites. I contacted him to express my interest. He liked my work, and said he had moved to Brown University in Providence, Rhode Island, and was looking for a new student. He helped me secure admission and full support within a month.

What was your most pivotal career decision?
I chose to switch schools halfway through my PhD. At Brown, I was measuring flow phenomena in microfluidic devices I designed — an interesting project, but predominantly experimental. I preferred designing and making devices. I started studying the work of Chang-Jin Kim at the University of California, Los Angeles (UCLA), who was famous for the design and fabrication of micro-electromechanical systems. When I contacted him to ask about research openings, he invited me to join his lab. It was a very hard decision. Ultimately, Breuer said he wouldn't prevent me from exploring what I really wanted to do. He asked only that I finish my current project and publish the results. That paper is highly cited and considered a classic reference paper in microscale fluid dynamics (C. Choi *et al. Phys. Fluids* **15,** 2897; 2003).

Why didn't you do a postdoctoral fellowship?
When I was about to finish my PhD, I still hadn't published all of my major results. But because I had already spent two years at Brown and almost five years at UCLA, I worried that one or two more years for a postdoc was too long. I applied for faculty jobs even though I didn't expect much without postdoc experience. Fortunately, the Stevens Institute of Technology was eager to hire faculty members in nanoscale engineering and saw the potential of my work on superhydrophobic surfaces.

How did you differentiate your work from that of your mentors?
When I came to Stevens in 2007, I didn't want to compete with either of my previous advisers, so I decided to look for different applications for these superhydrophobic structures. I discovered that there was a need for anti-corrosive materials in ships and planes. I wanted to use our materials to reduce metal corrosion by minimizing liquids' contact with metal surfaces.

How did you secure funding from the US Navy?
Initially, US funding agencies thought my ideas were interesting but not practical enough to fund because I couldn't make nanostructures on a large scale. This challenge prompted me to develop ideas for creating nanostructures on the much larger metre scale. The engineering dean at Stevens connected me with a Navy programme manager who helped me to secure a year's funding for exploratory work. If I could prove myself, she thought I had a strong chance of securing more funding through the US Navy Young Investigator Program.

How do you think this award will affect your career?
I think it helps position me for tenure because my school holds the award in high esteem. The ONR selects only 10–20 people from more than 10,000 applicants. It is a great honour, especially because I am a foreigner. ■

Interview by Virginia Gewin

IN BRIEF

Wellcome funding change

The Wellcome Trust medical-research charity in London has unveiled an award scheme with no need for detailed budgets and methodologies. The scheme is intended to encourage ambitious proposals and boost productivity by freeing researchers from the time constraints of grant renewal. Wellcome's total funding of £600 million (US$885 million) is the same as last year, but this scheme allows for longer-term projects. Early-career and senior investigators at universities or research institutes can have a maximum of £425,000 a year for up to seven years. Alan Schafer, Wellcome's director of science funding, says the changes are also intended to ease burdens on grant reviewers.

Arizona boycotted

A group representing 22,000 Hispanic and Native American scientists in the United States has dropped Phoenix, Arizona, from its potential 2012 conference sites owing to the state's new immigration law. "We do not want to expose our members and conference participants to the potential for harassment by law enforcement," says Judit Camacho, executive director of the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS), based in Santa Cruz, California. The law lets officials query a person's immigration status based on a 'reasonable suspicion' that he or she is an illegal immigrant. SACNAS announced its decision on 10 May. The society will hold no events in Arizona unless the law is repealed.

Non-tenure survey mixed

Non-tenure-track academic researchers in science, technology, engineering and maths (STEM) in the United States had mixed feelings about their positions, says a survey released this month by the Center for the Education of Women at the University of Michigan at Ann Arbor. Respondents liked the flexibility of their positions and their freedom from the tenure process. But they were concerned about job security, generating funding, isolation on campus, unequal treatment compared to tenure-track faculty and lack of transparency about their contracts, titles and career progression. The centre interviewed 343 researchers from 12 universities. More than a third of all respondents worked in STEM.