

NEWS

Japanese mentors reap their awards

The winners of the sixth annual Nature Awards for Mentoring in Science, announced on 1 December, have had very different career paths. One has been doing the rounds at Japan's elite academic institutions for decades; the other is a slightly eccentric product of industrial laboratories. But they share scientific initiative as well as an open-mindedness to their students' ideas and a willingness to foster their students' independence.

The lifetime achievement award went to biophysicist Fumio Oosawa, who pioneered molecular studies on muscle contraction and helped invent the field of single-molecule biology. The midterm career award was won by computer scientist Hiroaki Kitano, who is renowned for his expertise in robotics and systems biology. The prizes, which were presented by Philip Campbell, editor-in-chief of *Nature*, at a reception in Tokyo, each carried a purse of ¥1.5 million (US\$17,000).

Like all the winners of *Nature's* mentor awards, Oosawa and Kitano share certain characteristics, says Campbell. They have broad vision, a keen interest in challenging students and a willingness to help them network to advance their careers.

Oosawa received his physics degree in 1944 from the University of Tokyo before moving on to Nagoya University and then Osaka University. Now 77, he initiated his research on muscle contraction in the 1960s by analysing the polymerization of actin. Kitano, 48, heads Sony Computer Science Laboratories in Tokyo. He began his career with information-technology company NEC in Tokyo.

Great support

Testimony from current and former students, who nominated the pair for the awards, reveals some of the characteristics shared by superior mentors. Kitano and Oosawa both cultivate independence in their researchers. Kitano, for example, routinely names laboratory members as corresponding authors on published papers. Both were praised for using their networks of colleagues and contacts to introduce their lab members to other established researchers in the field. "A lot of professors just don't take the time to do that," says Samik Ghosh, a researcher at the Systems Biology Institute in Tokyo, headed by Kitano.

Speaking at the awards ceremony, Akiyoshi Wada, who headed the judging committee,



Winning mentors: Hiroaki Kitano (left) and Fumio Oosawa.



said: "It's obvious that one generation of scientists should cultivate the next. But it's too obvious — so obvious that people take it for granted." Oosawa and Kitano did not, Wada added.

Kitano and Oosawa share a broad-minded approach to ideas that stimulate their students. "He takes an interest in every project," wrote one of Oosawa's nominators. In a written statement, Oosawa said that he makes sure to "respect the ideas of my students. I never said things like, 'I already thought of that'."

Absurd ideas

One student who nominated Kitano wrote: "He is ready to invest wholeheartedly in absurd ideas, and in some cases it seemed the more absurd the better." Kitano's 'absurd' ideas spawned RoboCup — a seminal competition that aims to produce robots, currently competing against each other, that can take on a human team — and the idea of a 'virtual human' — a computer model of a person, used in drug development (see *Nature* **451**, 879; 2008).

Such radical ideas appeal to young Japanese researchers. Hiroki Ueda of the Center for Developmental Biology, a former student in Kitano's laboratory and one of Japan's most prodigious talents, plays down the importance of the science knowledge he gleaned from working with Kitano. "I learned nothing in his laboratory," he says playfully. But Ueda, who considers himself a radical like Kitano, says he picked up "the atmosphere", which helped convince him that a career can be founded on unconventional ideas. "That's so cool," Kitano said when told of Ueda's comment.

In the laboratory, students address Oosawa

with the more-familiar honorific suffix 'san' rather than the formal 'sensei'. "He had little time for authoritarianism," says one student. Instead of an office, he had a table at the end of the laboratory, but he rarely used it, preferring to walk about and talk to students. Instead of the Oosawa 'lab', students spoke of a sort of nurturing open classroom where students could come and go with ease. Oosawa says he was careful not to push for a debate about findings while a student was still in the middle of collecting data. "I wait," he says. "I don't judge by the speed of the work. Having interesting ideas is the most important thing." Breaking down barriers made Oosawa an early

force in equal rights: in the 1960s, at a time when few Japanese women could find a career in science, a third of his laboratory was female.

Tough environment

The accomplishments of Oosawa and Kitano are all the more impressive considering their research environment. In Japan, a strong mentor-protégé culture often promotes deference rather than independence.

There are also systemic issues that can hinder the proliferation of great mentors, says Hitoshi Murayama, a theoretical physicist with positions at the University of Tokyo, the Lawrence Berkeley National Laboratory in California and the University of California, Berkeley. Japanese universities generally do not provide stipends to graduate students, so many have to work part-time to get through school. In Japan, professors can take anyone who comes, without necessarily worrying about the quality or future of their students. By contrast, US professors generally invest in young researchers by providing financial support from their grant monies, and so have more at stake. "Professors don't take on students unless they are serious about it," says Murayama, noting an upside to the US system. "This definitely creates a difference in the mentor-student relationship."

Oosawa and Kitano, though, have managed to thrive, and to help their students do the same — and both their own and their students' science careers have benefited as a result. As Campbell noted at the awards ceremony: "Not every outstanding scientist is a good mentor, but all outstanding mentors are outstanding scientists." ■

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