

# Japan expecting more from its academics

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Small discoveries could lead to major scientific developments and even bigger economic gain, if unveiling the movement of protein molecules is any indication. Or at least that's what one Japanese university is hoping.

Located about 150 miles north of Tokyo facing the Sea of Japan, Kanazawa seems an unlikely hotbed of scientific research, known in Japan more for its traditional tea houses, regional seafood cuisine, and snow-covered homes than an epicenter of industry. Yet it is from state-funded Kanazawa University that academics like Toshio Ando are hoping to compete head-on with nanotechnology researchers worldwide.

The physics professor said that his study of motor protein movement using high-speed atomic force microscopy is unsurpassed, and that rivals at MIT, Stanford, and Bristol Universities have so far been unable to emulate, as he claims that no other research institute in the world so far has as powerful a microscope as Kanazawa.

For a layman, knowing just how motor proteins move, often backwards, may not seem like a major breakthrough in scientific knowledge. Yet Ando pointed out that there are numerous practical applications for the knowledge in industry.

"This can be used for examining semiconductor instruments, to check the accuracy of chip wafers faster than ever," the professor said, adding that one major U.S. precision instrument manufacturer has already bought the patent right to the technology, even as he declined to name the company because "it's such a huge, influential one."

"I went to visit them to see how they have progressed (in examining wafers) after they obtained the license," Ando said, and he pointed out that the examination process has not only become shorter, but also more effective as well. "This is improving nanotechnology...integrated circuits are becoming ever more precise, and it is more important than ever to make sure there are no faults found."

Research that leads to patents and ultimately to profits is something that not only Japanese universities are seeking, but the government as well.

Next month, legislators will be voting on whether or not to approve a \$212 billion budget over the next five years to ensure scientific research. In particular, the government is eager to ensure more developments that will have direct impact in boosting economic growth and improving living standards, particularly in the fields of life sciences, information technology, and environmental sciences as well as nanotechnology.

One problem, however, is that as of today, there are still few financial incentives for Japanese researchers to be innovative, unlike their counterparts in the United States and Europe. State-funded universities led by Tokyo University are still considered the best research institutions in the country, but their employees -- including academics -- are still effectively considered as public servants. As such, their salaries are based more on the number of years served rather than whatever new discoveries they bring to the table, and there is no bonus payment system based on the amount of patents they have been able to generate. In addition, they face constraints when working with the private sector on a for-profit basis or accepting research grants from private corporations.

But perhaps the biggest problem that the Japanese research community on university campuses faces is the old-guard mindset of researchers themselves.

When questioned about the practical applications of his studies on the movement of motor proteins, Ando replied curtly that he loathed being questioned about how knowledge can be applied in business and industry.

"When I do my research, I don't think about what applications exist," he said, adding that "I just want to focus on discovery."

An official of Kanazawa University, however, argued that while there are many researchers like Ando who are focused on research purely for research's sake, the number of those who are eager to collaborate with the private sector and see practical use of their studies is increasing, while the university itself is currently studying the possibility of introducing a bonus system based on research achievements.

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