EMBO reports

interview

Science in the Orient

An interview with Jeongbin Yim, President of the Asia-Pacific International Molecular Biology Network, Seoul, South Korea

EMBO reports (ER): The Asia-Pacific International Molecular Biology Network (A-IMBN) was established to promote science in this region. Why do you feel that the network was needed, and how are you organizing international cooperation between members as diverse as South Korea, Japan, India, China, Australia and New Zealand?

Jeongbin Yim (JY): I started to work towards founding the A-IMBN in 1993 when I was the Director of the Institute of Molecular Biology and Genetics at Seoul National University in South Korea (IMBG, SNU) and looking for a leading research institute for international collaboration. That year I happened to meet Dr Ken-ichi Arai, from the Institute of Medical Science at the University of Tokyo in Japan, and we immediately agreed to start a bilateral, bi-institutional collaborative programme. We felt that the programme was successful and expanded it to a six-institutional network, which now includes the Institute for Virus Research at Kyoto University in Japan; the Samsung Biomedical Centre at the Sungkyunkwan University in Seoul; the Institute of Biochemistry and Cell Biology (IBCB) at the Shanghai Institutes for Biological Sciences in China; and the Institute of Biochemistry and Molecular Biology, National Taiwan University in Taipei. We held annual meetings to bring the six institutes together and this collaboration later developed into the A-IMBN.

When we formed the A-IMBN, our mission was to promote molecular biology and biotechnology in the Asia-Pacific region. Currently, we have about 300 members from 16 participating 'economies'—we call them 'economies' because of the political situation in China and Chinese Taipei—and we have 16 supporting institutes. All of them are leading institutes in the region and the Asia-Pacific Economic Corporation (APEC) also supports the initiative. We organize an annual conference, and support workshops and training courses.

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One of the long-term goals of the A-IMBN is to establish an international molecular biology laboratory (IMBL)—like the European Molecular Biology Laboratory (EMBL; Heidelberg, Germany)—but it is proving difficult. In an effort to move toward this goal, we have established a 'virtual' IMBL network that we have called the electronic IMBL (eIMBL). This network was proposed at the APEC Science and Technology Ministers' meeting three years ago in New Zealand and received broad support. We have established four so-called 'eIMBL unit laboratories'. The first is located at Kwangju in Korea, focusing on systems biology; the second is in Tokyo, focusing on DNA replication; the third is in Taipei, focusing on genomic medicine—James Shen is the head of this particular unit lab; and the fourth is in Shanghai and specializes in molecular oriental medicine.

Each unit laboratory is responsible for coordinating the research activities of the participating labs by using the infrastructure provided by the eIMBL system. To this end, we have developed a rather sophisticated web-based system that supports real-time video conferencing and means that participating members can discuss experimental results with their collaborators. Additionally, at least once a year, each unit laboratory organizes a workshop to discuss progress with the participating primary investigators.

ER: How willing are scientists to embrace these new forms of communication and collaboration?

JY: It is not easy, partly because we cannot provide any research funding and partly because this is a ground-breaking virtual network. We have found that the head of each unit laboratory is very important—he or she has to be very active and has to promote virtual methods of communication. Also, as a cyber laboratory network, we feel that the annual conferences are vital for the interaction of all the participating laboratories. We also try to provide personnel to work on the eIMBL computer system—at the moment we have one systems manager in Kwangju, and one in Tokyo.

ER: Do you think there will be difficulties in deciding where to build a physical IMBL—how will you decide which country gets to host the laboratory?

JY: We have already tried to build one on several occasions, including efforts by both Korea and Japan. Arai and Kiyoshi Kurokawa—who later became an advisor to the Prime Minister—coordinated the Japanese attempt. However, we have found that it is not that easy to found a physical laboratory, even though we have all tried to mobilize our personal connections to politicians.

Credit: Volker Wiersdorff

Despite these difficulties, we have managed to establish an eIMBL common laboratory at the IBCB in Shanghai. They provide space for researchers working for the A-IMBN and we have been able to appoint two A-IMBN professors. We provide US$100,000 funding for these positions and, in that sense, we have been partly successful in securing a common physical laboratory. In fact, the IBCB institute has just constructed a new building in Shanghai that will hopefully open its doors in July and will be a common IMBL laboratory.

ER: Do you think that fellowship schemes to help researchers travel around the A-IMBN member countries would help to further cooperation?

JY: Certainly, we would like to offer such fellowships, but again we are short of funds. Of course there are some contributions made at the governmental level, and donations from private companies and individuals help; however, to make a sustainable organization we need a more stable source of income.

> **The question is what material, product or service can we produce that can support Koreans in the future. Literally speaking: what is it that can 'feed' Korean generations to come?**

Therefore, we recently established the IMBN Venture Company in Seoul. The founding members are A-IMBN participants, although the initial funding of US$2 million comes from a Japanese venture capital company. We are planning to raise an IMBL Venture Fund of up to US$30 million hopefully by the end of next year. This will be a commercial company, of course, but one of the reasons we established it was to support various A-IMBN activities and to make A-IMBN a more sustainable organization with an established funding mechanism. If we are able to sustain the IMBN fund, then we can use some percentage of the profit to support A-IMBN activities.

ER: You have also been director of the Bio-MAX Institute in Seoul, which was established to increase the overall quality of Korean research and to attract international researchers to South Korea. How effective have you been at achieving your stated aims?

JY: Seven biotechnology-related colleges at the Seoul National University initiated the Bio-MAX initiative. The goal of Bio-MAX is to establish an international centre for research and education in the areas of bioscience, biomedicine and bioengineering. When Bio-MAX began, it was proposed that one-third of the newly recruited faculty should be foreign scientists and that their salary should be higher than that of Korean scientists as an incentive to attract them to Korea. In 2003, the Korean government decided to fund Bio-MAX and to provide US$5 million per year to support the institute. Unfortunately,

we have not yet secured funds from the private sector, and it is private donations that we need to construct a physical building to house Bio-MAX.

However, despite this delay, I believe that the spirit of Bio-MAX is still strong, and our work has had a great influence on the Korean scientific community. Many Korean scientists now widely support the Bio-MAX vision in which 'M' stands for multidisciplinary, 'A' for adventurous and 'X' for excellence. Our vision was to recruit and support adventurous, leading scientists with a strong emphasis on multidisciplinary research and the inclusion of prominent foreign scientists.

Although we are now struggling to obtain private donations, many other leading universities in Korea are making the same changes that Bio-MAX initiated. Recently, many of our universities began to emphasize globalization on campus, and increase and evaluate the number of courses taught by and to foreigners in English. Also, in Korea, housing is very expensive, so to attract more foreign scientists we have expanded housing facilities for foreign visitors and foreign faculty members. We have also started new schools for foreigners, and elementary schools and kindergartens for foreign children. There are large changes occurring in Korean science partly as a result of Bio-MAX, but we are struggling and will have to wait and see how it works out.

ER: Given that Singapore has already been successful at attracting scientists from North America and Europe, why was the decision made to create something new with Bio-MAX, rather than using the resources of a well-respected institution like Seoul National University?

JY: The Bio-MAX proposal was the result of a working group and was approved at university and government levels. From our discussions it was clear that Seoul National University—compared to other competitive universities worldwide—was very homogeneous. Over 90% of SNU faculty members at the time were SNU graduates and the female to male ratio was very poor. It was felt that we needed 'new blood' in order to be successful. At the time, many of the SNU faculty had experienced some training in the USA, so they understood how top US universities recruit faculty members. We really wanted to reflect the methodology of US universities, and this became one of the most important features of the Bio-MAX project.

ER: Do you see North American and European universities and research institutes as role models or benchmarks? Or was the idea to create something uniquely Asian, based on a more Asian tradition than on a western university system?

JY: Each department at SNU has chosen a foreign university department to compare itself to in terms of teaching and research. For instance, the Department of Biological Sciences at SNU benchmarks itself against the Department of Molecular and Cell Biology at Berkeley, USA. Most of our faculty members have been trained in the United States, but there is currently little interaction with European institutes—the ratio of those trained in Europe to those trained in the USA is very small.

> **Of course, for Korea, the situation is the same as for Singapore and many other Asian countries—globalization is a real issue for all of us—and this is our effort to address it**

ER: Is interaction with Europe something you are trying to expand, or do you see the USA as your more natural partners?

JY: We would like to diversify the range of countries where our faculty members are trained. Most recently, we appointed two new female members of faculty who received their doctorates from the UK—one from Oxford, one from Cambridge—though in fact they did their postdoctoral training in the USA. We would like to have more people trained outside Korea and especially in Europe because they contribute many more ideas to the way SNU is run, and bring diversity to a very conservative system.

ER: In terms of attracting foreign researchers, do you feel that you are over-shadowed by your larger neighbours China and India—or is it that people aren't aware that South Korea is developing its scientific research and offers so many opportunities?

JY: China is changing really fast and improving in all aspects of science. In Korea we understand China's potential, so in order to compete with China we have to have a different approach. Also, in recent years, the number of Korean students going to Chinese institutes has been increasing rapidly.

ER: Because South Korea is moving away from a manufacturing-based economy to a high-technology-based economy—in line with India, China and Japan—do you think that you have to do something special to be competitive in the long run against other Asian countries?

JY: This is an important issue for the Korean government—to devise and evolve our strategy for national development. The question is what material, product or service can we produce that can support Koreans in the future. Literally speaking: what is it that can 'feed' Korean generations to come? In the past, the manufacturing of semiconductors, shipbuilding and car manufacturing provided a stable income for our country—but not anymore. Because of this, we have high hopes for the biotechnology field and the initiatives and advances that we are putting in place and making there.

ER: How then, has the case of Hwang Woo Suk damaged this whole process—both in terms of the international reputation of South Korea's science and in the national development of Korean science and biotechnology?

JY: Dr Hwang was an important member of the Bio-MAX team that I chaired for many years, so personally it was a very painful experience for me to learn of the scandal. He was the director of the research and he was the creator of the entire drama, so one cannot deny his responsibility. However, I would say that at the time many Koreans—including patients, disabled people, government ministers, and leading figures in industry—had very high hopes for his success. There was also huge pressure from the mass media and the 'superstar' status that had been bestowed upon him. In a very real sense he must have felt that he simply could not let people down. Therefore, I think that to some extent everybody is responsible for the scandal, or at least for creating the environment in which he felt compelled to make claims above and beyond what he had evidence and research to support.

On a national and international level, the Hwang scandal has had a very positive effect on Korea. Our government has enforced stricter guidelines for stem-cell

research and for projects related to the bioethics field so that the integrity of research has become a very important issue in Korea. For instance, at SNU we have formed a Committee on Research Integrity that has published a comprehensive report listing many types of misconduct, including falsifying or altering data and plagiarism. Of course this has had a huge impact on Korean scientists in terms of additional bureaucracy, but it now enhances and reinforces the quality of our biotechnology and scientific research.

I see these improvements as a very positive thing, and I would like to point out that young Korean scientists—not the *Science* editors or anybody else—first raised people's awareness of the misconduct. Seoul National University, led by President Un-Chan Chung, immediately formed a committee to investigate the allegations and, as soon as they were confirmed, Dr Hwang's professorship was revoked. I should point out that at the time it was a very difficult decision to make because Dr Hwang was a national hero and a scientific icon. Stripping him of his professorship was a very courageous thing for his peers to do.

So of course many Koreans and Korean scientists feel sorry for Hwang's misconduct, but I don't think we have to feel shameful for his deed or our response to it. It was a difficult but ultimately positive experience for us.

ER: Do you see this kind of pressure to produce results as a general problem in science, not only in South Korea or Asia?

JY: I do—there is much more pressure to perform now. Also the pressure comes from many more sources: governments, the media, funding bodies and the public, for example. I think the answer to this problem is to improve science education, all the way from elementary school to high school and on to university. Fraudulent scientific claims occur everywhere these days—there are far more globally relevant projects now with researchers under pressure from many different funding agencies or governments.

ER: Do you also see these problems affecting international collaborations or the way that A-IMBN members work with one another—or do you still believe that the basic scientific ideals of openness and cooperation among scientists are paramount?

JY: Openness and a willingness to share results is a very difficult thing to pursue. There is the very real question of how to protect your own intellectual property, data and research. However, we have to pursue collaborations—especially international collaborations—if we are to improve and succeed and make a difference.

> **What can you do? English is the language of science and science has no borders.**

From the Korean point of view we are actively seeking beneficial international collaborations. In fact, the Ministry of Science and Technology (MOST) established the Korea Foundation for International Cooperation of Science and Technology (KICOS) to identify, evaluate and host leading institutes in science and technology from overseas. Most recently, we hosted researchers from the Pasteur Institute (Paris, France), the Fred Hutchinson Cancer Research Centre (Seattle, USA) and the Cavendish Laboratory (Cambridge, UK). Those are all internationally renowned institutes that will open branch institutes in Korea soon.

Additionally, we'll move Korean equivalents of the USA's National Institutes of Health, Food and Drug Administration, and Centers for Disease Control and Prevention to Ochang, all in the same complex with new hospitals and international pharmaceutical companies. Also, in the Incheon Free Trade Zone, we intend to recruit high-tech industries, leading research institutes from oversees, and R&D centres from big companies. Of course, for Korea, the situation is the same as for Singapore and many other Asian countries—globalization is a real issue for all of us—and this is our effort to address it.

ER: Do you see a disadvantage for many Asian researchers that English is still the lingua franca of science? Do you see a future for non-English-language journals?

JY: What can you do? English is the language of science and science has no borders. But we are addressing this imbalance to some extent. As part of the eIMBL project we decided to set up an online journal, *A-IMBN Research News*, published by Nature Publishing Group (NPG), to highlight the best research carried out by the A-IMBN and eIMBL-supporting institutes. We select the top papers from our researchers published in journals like *Nature*, *Science*, *The EMBO Journal*, *PNAS* and *Cell*, and the NPG editors rewrite and highlight the summary. We are currently appointing the editorial board, and the online Journal will launch in July and be published monthly. This is another initiative that will be very useful for publicizing our activities and those of the Asia-Pacific region to the world.

ER: Is international recognition something that you think is important to validate the work of the A-IMBN?

JY: I hope that some day the activities of the A-IMBN will be recognized internationally—we have many opportunities. At a national level, it is important for South Korea to be able to compete with the world. We already have a good reputation for bioscience research and biotechnological advances, and I think that if we build on our strengths and make foreign researchers feel welcome and valued in Korea, we will succeed and play an important role in the international scientific community. The Asia-Pacific region has a lot to offer and together we can make the A-IMBN dreams come true.

ER: Professor Yim, thank you for the interview.

The interview was conducted by Holger Breithaupt and Samuel Caddick.

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