

SOUTH KOREA

Focused on recruiting overseas researchers and encouraging basic science, this Asian tech hub is using research to drive development

SEONGJUN CHO/BLOOMBERG/GETTY IMAGES



Among the fruits of R&D investment are companies like LG Electronics, whose headquarters are in Seoul.

When it comes to science, South Korea is an ambitious player. It invests more of its GDP in research and development than any other developed nation except Israel. This has helped propel the country's rapid rise from war-torn nation to G20 summit host and home of powerhouses like Samsung and LG.

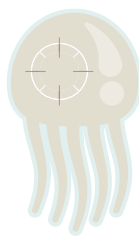
But only within the past decade have universities begun to employ more scientists from abroad, boosted by a government programme established in 2009 that committed around \$700 million to help universities bring talent from abroad. This recruitment drive is not without complication, not least because of cultural and language barriers. Foreigners often feel disadvantaged seeking funding as many agencies require applications to be submitted in Korean.

The attempt to attract more foreign recruits coincides with efforts to boost basic research, after decades of focusing on applied research and economic growth. President Park Geun-hye has pledged to ease the path for tech start-ups, limit the influence of the tech giants and to kickstart a "creative economy". Halfway through her five-year term, the results have been mixed. The Institute for Basic Science, a research centre founded in Daejeon in 2011 aimed at rivalling

Japan's RIKEN, has since opened other centres, but scientists say that grant pools are spread thin, and levels of individual grants are flat or falling.

On the positive side, junior researchers in South Korea enjoy relatively great freedom and are not expected or obliged to work on projects run by senior academics.

Foreigners are often surprised by the array of equipment at their disposal. "For biology, there is everything we need in Korea," says Eric di Luccio, a structural biologist from France who joined Kyungpook National University in Daegu in 2010. That includes national facilities such as the Pohang Accelerator Laboratory that are not yet on the radar of researchers who might trek to Japan or Taiwan for instrument time. "There is a lot of infrastructure and research going on, and it's not widely recognized yet," says di Luccio. ■



South Korea's Jellyfish Elimination Robotic Swarm (JEROS) provides an automated solution to problematic jellyfish blooms. Robots hunt in packs, each capable of pulverizing 400 kg of jellyfish every hour.

Thanks to South Korea's push to make its scientific workforce more international, the government freely approves work visas for researchers, though anecdotal reports suggest there can be hold-ups at the university or department level if institutions are not accustomed to employing foreigners and are unfamiliar with the required documentation. These

visas need to be renewed annually. Foreign nationals whose parents or grandparents emigrated from South Korea — or who were once citizens themselves, including those adopted abroad — are eligible for an Overseas Korean F-4 residence visa. This grants nearly all the benefits of citizenship except voting rights, and is not specific to a particular employer.



HAKIM DJABALLAH
 > EMPLOYER
 > CHIEF EXECUTIVE OFFICER
 > INSTITUT PASTEUR KOREA

Are there good opportunities for postdocs in Korea?

Coming here for three years or so is a great opportunity for a postdoc considering it as a little bit of a break to do some teaching, enjoy life in Korea and explore Asia. You may struggle in terms of publications unless you're at Seoul National University. Korea has been struggling with publishing in high-profile journals because editors and reviewers get more sceptical with the things that they send because of past fraud. I think many editors have had their fingers burned, and they often consider our researchers guilty until proved innocent.

What are the main obstacles for foreign scientists in Korea?

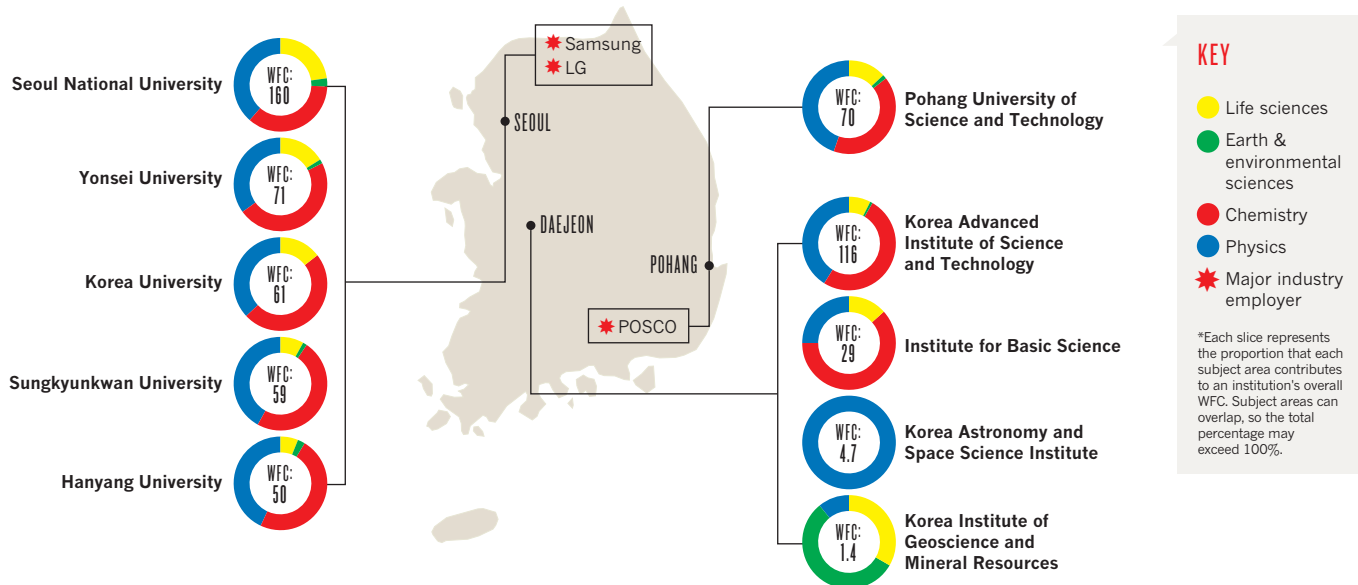
The lack of transparency and fairness of the granting and peer review systems. Foreign researchers in Korea suffer a lot because of the old boy network. It's often a case of, 'We went to kindergarten together, so I'll fund you.' You would never expect foreign scholars to be required to write grant applications and to have to defend their proposal in Korean, yet often that is expected. My researchers here suffer from that. We feel discriminated against.

What advice would you give to scientists coming to Korea?

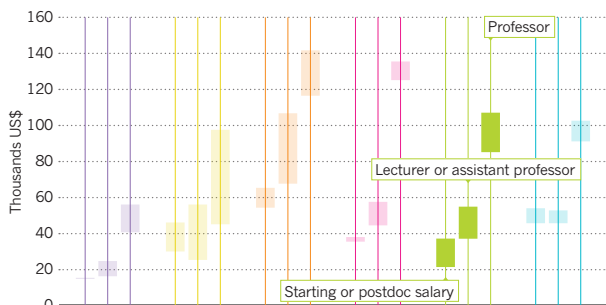
Negotiate everything in writing before you get here. The Koreans have a tendency to say, 'It's OK, we'll take care of it once you get here.' Scientists need to get agreements on everything from salary to health insurance, all the way to if they are married and want to bring their family, how they're going to do it. ■

WHERE TO WORK

The below charts represent the research output included in the 2014 Nature Index for ten of South Korea's leading institutions, and the contributions of different subjects, measured by weighted fractional count (WFC).

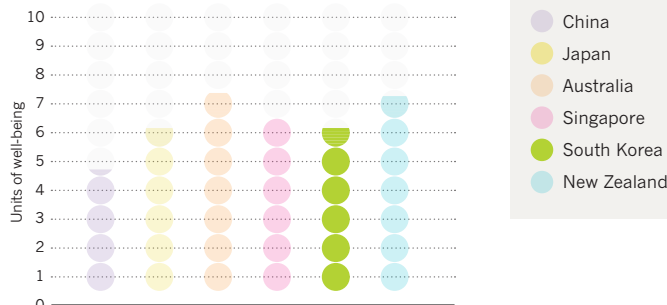


SALARIES



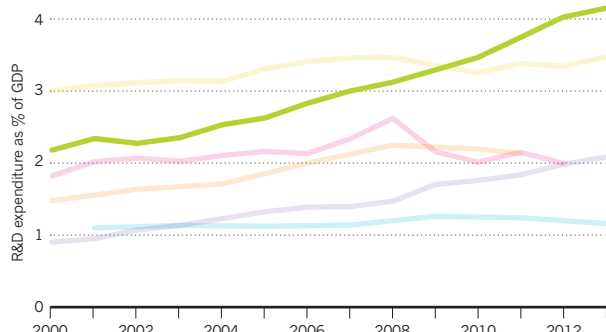
Postdocs are relatively badly paid and professors better paid compared to the same grades elsewhere in the region, according to our ranges based on reported data.

REPORTED WELL-BEING



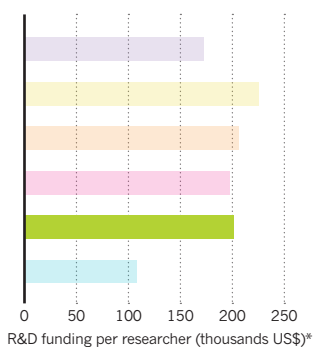
Life satisfaction among South Koreans is just below average for the six countries.

FUNDING OVER TIME



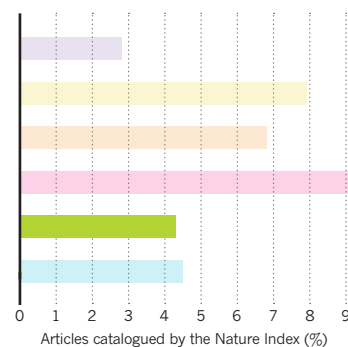
South Korea has roughly doubled its proportion of gross domestic product (GDP) spent on research and development (R&D) in the past decade.

SPENDING PER RESEARCHER



Despite investing the highest proportion of its GDP in R&D, South Korea spends only the third most in the region per researcher.

RESEARCH QUALITY



Only China scores lower than South Korea in the proportion of scientific papers published in Nature Index journals.

*Figures are normalized for purchasing power, and are the latest available for each country.