National vision

The vast IBS network signals South Korea's ambitions, but research focus may be adjusted after centres face scheduled scrutiny. **By Mark Zastrow**

South Korea's highest-profile investment in basic research is in the Institute for Basic Science (IBS), a network of research centres that comprises the nation's answer to Germany's Max Planck Society and Japan's RIKEN.

Founded in 2011 after a 2007 promise by conservative, Lee Myung-bak, during his successful campaign for the country's presidency, the institute sought to attract elite researchers from at home and abroad by giving successful individual applicants, as centre directors, full autonomy over their centre's research and a budget of 10 billion won (US$8.2 billion) per year for ten years.

The centres cover areas including dark matter, nanomaterials, genome engineering and climate change. But, after criticism that they were taking money away from the greater scientific community, the goal of 50 centres has been reduced to 30 for now, with average budgets trimmed to about 6 billion won.

IBS president, Noh Do Young, warns that the cuts are "likely to inhibit IBS's efforts to fulfil its missions and visions", arguing that the budgets are not large, considering centres can employ dozens of researchers each.

Many IBS researchers say the level of funding has helped their research reach new heights. For instance, in March 2020, the Center for RNA Research at Seoul National University used cutting-edge sequencers purchased with IBS funds to become one of the first research groups in the world to sequence the transcriptome – the total product of all expressed genes – of the coronavirus that caused the COVID-19 pandemic[1]. The sequencers can directly identify the molecules in RNA sequences, as well as where they are modified by other molecules. Narry Kim, a biochemist and the centre's director, says the work required an interdisciplinary team of virologists, microbiologists and computational scientists, which was enabled by IBS's steady support. "Without IBS funding, I don't think it would have been possible," she says.

Among other prominent IBS results, the Center for Genome Engineering supplied the gene-editing tools in a blockbuster 2017 study[2] in *Nature* that claimed the CRISPR–Cas9 gene-editing system was used to correct a mutation that causes heart disease in viable human embryos by replacing the mutated copy from the sperm with the correct gene from the egg. The results have been hotly debated, as some scientists argue there could be alternative explanations.

In 2018, results reported in *Nature*[3] by the Center for Underground Physics, from its laboratory in a subterranean power plant in Yangyang County near the country's east coast, ascribed constraints to the theorized particles that could make up dark matter. And in 2019, a collaboration including the Center for Climate Physics in Busan proposed in *Nature*[4] that the first ancestors of modern humans came from a prehistoric wetland in modern-day Botswana, roughly 200,000 years ago. The work combined the centre's supercomputer climate models with a genetic analysis of populations in Namibia and South Africa.

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Narry Kim, director of the Center for RNA Research at Seoul National University.

Political strife

IBS came under heavy scrutiny in 2019, when reports surfaced in South Korean media of misappropriated funds and nepotism in hiring, which had allegedly been uncovered by government audits, at several centres. Doochul Kim, a physicist who was president of IBS at the time, said these were mostly the result of administrative errors and that the audits were politically motivated by liberal lawmakers. In late 2019, Kim announced reforms to IBS's administrative structure, to be carried out under his successor, Noh, who started in November 2019.

The year 2020 marks another significant milestone for IBS: the first group of centres are coming up for review. Unlike at the Max Planck Society, centre directors at IBS are not awarded a lifetime appointment, and centres are subject to a make-or-break review after eight years to determine if they will be extended beyond their original ten-year remit. "This review session will shape the future of IBS," says Noh. He says centres may close as a result, although new centres may take their place. (Noh adds that the process may be delayed by the COVID-19 pandemic, if crucial on-site visits by international reviewers, scheduled for July, cannot go ahead.)

The model has its advocates. "I like that pressure," says Andreas Heinrich, who left IBM Almaden in San Jose, California, to lead the IBS Center for Quantum Nanoscience in Seoul. "If I cannot build a top-class research centre in eight years, either I'm not the right person for the job, or it's not possible in that environment."

Mark Zastrow is a science writer based in Seoul.

1. Kim, D. *et al. Cell* **181**, 914–921 (2020).
2. Ma, H. *et al. Nature* **548**, 413–419 (2017).
3. Adhikari, G. *et al. Nature* **564**, 83–86 (2018).
4. Chan, E. K. F. *et al. Nature* **575**, 185–189 (2019).

Correction

National vision

This article originally gave the incorrect founding date for IBS. It was founded in 2011, not 2012. The article has now been corrected.

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