Jae Cheon Yeo – Executive Director, Korea Drug Research Association (KDRA)

The urgent challenge for new drug developers is to secure the funds needed for innovation

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Established in 1986, the KDRA is Korea's leading new drug research and development special corporation, established under the Ministry of Science and ICT and composed of 350 members

. Its executive director, Jae Cheon Yeo, explains the crucial role the organization plays in promoting R&D in Korea, the evolution of the innovation ecosystem in Korea, and what remains to be done to turn the country into a global player in the field.

Could you briefly introduce our international audience to the history of KDRA?

In preparation for the revision of the substance patent system in 1986, the state established the Korea Drug Research Association through the Industrial Technology Research Association Promotion Act as a special corporation under the Ministry of Science and Technology. The founding members of the association were 15 pharmaceutical companies and biotech companies. Thirty-three years later, about 350 companies, academic institutions, research centres and hospitals are now part of KDRA, working on developing new drugs and forming open innovation partnerships at home and abroad. During this period, about 1,000 new drugs are being studied in Korea, and the active transfer of global partners and new technologies, lead-compounds and candidate-compounds is underway.

How has the pharmaceutical landscape evolved since the creation of the KDRA?

After the Korean War, our country's pharmaceutical industry focused on addressing the most pressing public health concerns by importing and selling finished medicines as well as importing raw materials to produce generic medicines. Gradually, the industry secured more advanced technologies by forming partnerships and joint ventures with leading foreign pharmaceutical companies. For example, in 1962, Handok established their first technical partnership with West Germany's Hoechst AG and began producing the latest medicines in Korea. Since then, a number of other Korean pharmaceutical companies have done the same, allowing them to accumulate the knowledge and technologies necessary to start developing their own medicines.

As the trend towards a globalized economy accelerated in the 1980s, pressure on Korea to open its doors increased. With the gradual liberalization of drug imports, local companies began to face foreign competition directly. As a result, Korea's pharmaceutical companies embarked on research and development of medicines in order to remain competitive, with the support of the state.

Moreover, the reform of the substance patent system in 1987 also increased the need for new drug development. Previously, South Korea did not recognize patents for materials and only recognized patents for processes. Thus, new drugs developed by multinational pharmaceutical companies could be locally manufactured by changing the process slightly. After the patent reform, compounds developed abroad became protected by intellectual property rights, providing an incentive for local companies to engage in their own in-house research.

Moreover, the government recognizes the importance of the biopharmaceutical industry to drive future growth. At the Science and Technology Strategy Meeting in 2016, the bio-health industry was selected as one of nine national strategic projects to bring about the fourth industrial revolution, followed by the Ministry of Trade, Industry and Energy's announcement of policies for the development of the bio-health industry (biomedical/digital health).

What are the most pressing concerns of your members?

The urgent challenge for new drug developers is to secure the funds needed for innovation. A virtuous circle of new drug development systems (programs) should be established that can generate huge profits by supplying proprietary innovative drugs to the world market and reinvest these revenues in R&D.

National drug development support is a necessary condition for global market development, and the government's top policy is to expand the government's funding for R&D projects and for research institutes and production facilities. It is also important to revise related laws, such as policy support for revitalizing mergers and acquisitions, support for establishing R&D integrated facilities and corporate research facilities, and the revision of the Pharmaceutical Affairs Act, which has failed to keep up with changes in high-tech technologies.

One of the main strategic axes of KDRA is the activation of global open innovation. What initiatives have been put in place to foster global innovation partnerships?

A practical way to develop new medicines in a short time is to activate open innovation. The KDRA has put in place initiatives to foster business partnerships, technology transfers and licensing agreements between pharmaceutical and biotech companies, academic and public research organizations domestically and internationally. One such initiative is the Interbiz Bio-Partnering & Investment Forum held on Jeju Island every year where more than 1,000 people from 100 companies from home and abroad gather to form a vibrant technology trading marketplace.

Another endeavour is to provide services for technology transfer, licensing and R&D cooperation activities between members and domestic and foreign partners, centring on the Parmatech Business Center, which was established 20 years ago under the KDRA.

Our members are confident that their accumulated experience will help them become global market leaders. As the years pass, we will continue to see the global march of new drug development in the biopharmaceutical sector.

What have been the major success stories in new drug R&D?

Some of the best examples are the high blood pressure drug *Kanarb* developed by Boryung Pharmaceutical, the Gastric ulcer drug *Noltec,* and the Leukemia drug Supect developed by Il-Yang Pharm, an Antibiotic drug *Sivextro* and a Diabetes drug *Suganon* developed by Dong-A ST. This is by no means an exhaustive list and there are many others.

In addition, Last year alone, nine companies exported 11 technologies for KRW 4.8 trillion (USD 4.3 billion). A number of new drug pipelines from bio-venture companies and startups such as iNtRON Biotechnology and ABL Bio have continued to be released in domestic and foreign markets through

development stages.

Sooner or later, a Korean pharmaceutical company will develop a global blockbuster drug. This could greatly contribute to securing national industrial competitiveness.

If Korean pharma companies keep licensing out their technologies, how can Korea ever have a company in the top 50?

Indeed, there are many cases in which early research is transferred to foreign companies in Korea where development funds are insufficient. If Korea ever hopes to have a pharma company in the top 50, a global business model that utilizes the technological, financial and human resources of pharmaceutical companies, biotechs, VC funds, universities and research institutions should first be created. Second, Korea should move away from its positive regulation system that stifles innovation and move towards a negative regulation system like the one in the US. Last but not least, clinical research support funds needed for global market development should be increased.

In 2017, the Korean government launched the Bio-Economy Initiative 2025 setting many ambitious targets to increase Korea's share of the global bioengineering market to 5 percent from the current 1.7 percent by creating five home-grown blockbuster medicines by 2026. What is KDRA's role in this endeavour?

For every government-led R&D initiative, the KDRA takes part in decisions for establishing the roadmap, assigning roles and responsibilities to the different stakeholders, as well as capital allocation.

I think the goal of creating five blockbuster medicine in the next seven years is realistic.

What are your priorities for the coming year?

This year, the KDRA will strengthen its support for the industry through the promotion of public R&D projects, the establishment of clinical pipelines through basic and translational research, the strengthening of exit strategy projects, and enhancing the productivity of multi-ministerial drug development support projects. We will make every effort to ensure that the whole bio-accelerator system is implemented jointly by public and private actors.

We will also actively propose policies to support R&D investment in companies with bottom-up corporate support to enhance the global competitiveness of new drug development and propose plans for the incubation of new drug development programs. We will continue to push for negative regulation reform for new drug development by lobbying the government and the National Assembly.

Another strong focus will be strengthening the cooperative system among the stakeholders in the field of new drug development. To accompany this effort, we will reinforce our expert personnel and cultivate the expertise necessary to prepare strategies for the change in the global new drug development system, from government-led to private-led.

Finally, we will establish a cooperative system between our member companies, municipalities, and medical complexes to enhance corporate support for national infrastructure facilities supporting new drug development.

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