Shingyu Bae â?? CEO, MDimune, South Korea

Our vision is to give hope to cancer patients by providing innovative anti-cancer therapies

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Shingyu Bae, CEO of MDimune, explains how the companyâ??s new exosome drug delivery system increases efficacy and reduces toxicity compared with other oncology products. He also discusses the potential and attractiveness of the Korean biotech industry as a global leader in developing new technologies.

What was the rationale behind your decision to found MDimune?

MDimune is the second start-up I have founded, as I was previously involved in founding Chemizon Inc., a drug discovery company, which I co-established in 2005. The reason for starting MDimune was my mission to provide an anti-cancer drug with only a few side effects. My background is in biotechnology, so we started to work on an improved oncology drug delivery system in 2010. The technology our drug is based on was originally developed at POSTECH University in Pohang. At that time, I became convinced that this was a groundbreaking development. Hence, our vision is to give hope to cancer patients by providing innovative anti-cancer therapies.

You have set the ambitious target to develop the worldâ??s first exosome Nano-anticancer drug. How has this project progressed?

We have almost completed setting up the process development, which is necessary for the commercialization of this technology. It has been very challenging as we had to organize the manufacturing processes from scratch. The technology uses immune cells as a vehicle, which have specific targeting functions. In particular, our DDS technology, which enables drugs to be delivered only to cancerous tissues to the exclusion of normal healthy tissue, represents a breakthrough in the field. We have maximized the efficacy of this technology, and today the MDimuneâ??s BioDrone platform, which safely delivers cytotoxic, anti-cancer drugs with exosome-mimetics, is the most advanced drug delivery platform in its class.

We are collaborating with Samsung Medical Center and Asan Medical Center as well as several University Medical Schools. On the other hand, we are also partnering with cell therapy companies because they have the raw materials, immune cells and stem cells necessary for the production of exosomes for our technology. As we are mainly focused on process development, improving the production yield and GMP manufacturing, we need partners on both sides to be successful. We are also interested in out-licensing technologies to biotechnological and pharmaceutical companies.

The key focus of your research is the development of cancer treatments through exosome cells. What differentiates you from other biotechs investigating oncology treatments?

Cancer treatment is a very complicated field, which requires years of research, especially when it involves specific targeting technology like our products. Killing cancer cells through immune cells is a complex process and has a limit, so I am very confident that our vehicle technology, based on a parent cell, will be more efficient than a single antibody treatment. Our product allows a higher production yield while having the same characteristics as the products of competitors. So far, we have patented this technology in Korea, China, Japan, and the EU. The application for the patent in the USA is ongoing.

MDimune was selected as a company to be awarded the â??Post-TIPSâ?? by the Small and Medium Business Ventures won for overseas marketing support project. What will be the impact of these programs on MDimuneâ??s operations?

It has been very helpful for us to receive this government funding. As a small company, only founded three years ago, we are dependent on external support. The funds have been used to further develop our anti-cancer drugs, but also diversify our stem cell pipeline into the osteoarthritis treatment area. Chronic obstructive pulmonary diseases have also a been a focus of treatment for MDimune, and the funds received through the government have played a big role in this achievement. However, it is not easy to get the funding, and the sums provided are usually limited in size. Thus, we have been in a very fortunate position. In general, we hope to see more government support for the Korean biotech industry.

One of the key themes is Koreaâ??s embracement of the 4th industrial revolution. Given the range of interest in oncology drug development, what is the scope for Korean biotechs to become a leader in this field?

I worked as a venture capitalist from 1997 to 2005 and in this period, there were scarce opportunities to find and invest in Korean biotech companies offering impressive technological advances. Today, however, the market is flooded with fruitful Korean biotechs with new innovative technologies. I am very confident that the Korean biotech industry will continue to grow, as the country has a high level of technology and excellent academic and research institutes. Korean companies are very strong in developing products from scratch and bringing them to the market.

Korea has always held the potential of developing new visionary biotechnologies, but only recently has the industry realized how to evaluate and commercialize the findings made in research centres and universities. MDimune is a great example of this trend, having taken the research findings of a project at POSTECH university and with the assistance of a venture capitalist fund, built on this research to develop a product. Korea has many good technologies, which are only waiting to be commercialized. This is why I see great potential in the Korean biotech industry.

Nonetheless, funding, while it has increased, is definitely still an issue that is slowing down the industryâ??s growth. Another issue is the lack of collaboration within the industry. Older Korean pharma companies prefer late-stage drug candidates for collaboration and investment. they are traditionally focused on generics and incrementally modified drugs. Moreover, they are not willing to assume large risks, despite possessing the financial capabilities. Instead, they maintain a preference for in-licensing foreign products. We are therefore working to change this mindset in the industry and foster collaboration.

What is your vision for MDimune for the next five years?

We are aiming to receive approval from the Korean Ministry of Food and Drug Safety to enable our anti-cancer drug to be launched onto the market. For this process, we will require reliable and strong partners. Therefore, our primary goal is to find new domestic and international collaborations.

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