Korea Drug Development Fund
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KDDF: bringing Korea's multi-modality R&D expertise to global partners

Providing all round development and partnering support to Korean companies, Korea Drug Development fund is propelling Korea's cutting-edge research and assets to the world stage.

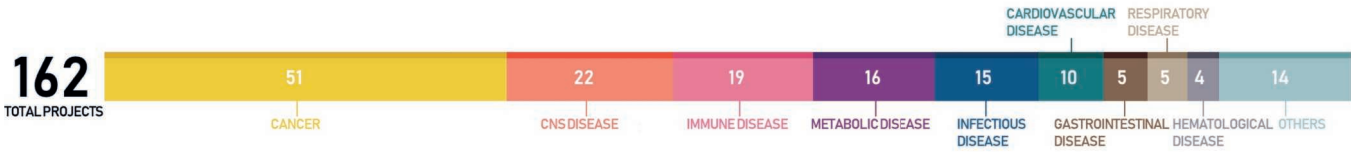

Fig. 1 | KDDF's therapeutic pipeline. KDDF's portfolio of drug candidates cover a broad spectrum of therapeutic areas.

Korea Drug Development Fund (KDDF) is bringing cutting-edge Korean science to the global market. Working with a $1 billion budget, KDDF has been supporting developers of 162 drug candidates as they work to gather data and strike global partnering deals.

KDDF, a government-funded organization, provides support that is tailored to the needs of groups working across drug development. By doing everything from helping academics to get drugs into the clinic to finding global partners for biotechs, KDDF has built a broad pipeline that reflects Korea's position at the forefront of research into many of the most exciting drug modalities (**Fig. 1**).

From aptamers to RNA interference (RNAi), antisense oligonucleotides to small molecules, KDDF's portfolio companies are using novel and established modalities to improve health outcomes. That process is exemplified by four KDDF-backed projects.

OliPass

OliPass wants to realize the full potential of antisense oligonucleotides (ASOs) by significantly improving cell permeability. Through the use of 'cationic-lipid' side chains, OliPass has developed a new type of ASO that permeates cell membranes without the use of advanced formulation.

Such enhanced ASOs have a wide range of applications. Working with KDDF, OliPass has taken an antisense molecule that lowers the expression of Nav1.7 into early-phase testing in the treatment of pain.

OliPass is also working on programs targeting VEGF-A, HIF1a, PCSK9 and PTP1b. The most advanced of these assets will enter preclinical safety assessment in 2020, positioning OliPass to further validate its novel ASOs.

Much of the work on these programs will take place at OliPass's state-of-the-art R&D labs in Korea. OliPass also runs a site in the US to foster collaborations with academic and industry partners in the region.

Aptamer Sciences

Aptamer Sciences is a biotech company developing aptamer-based technologies. These short, single-stranded oligonucleotides selectively bind to specific targets, giving them applications in research, diagnosis and therapeutics.

In exploring that range of opportunities, Aptamer Sciences identified an aptamer that targets insulin receptors (IRs). The aptamer, A48ms, induces monophosphorylation in the IR kinase domain through allosteric binding and selective activation of IR downstream signals. Through these actions, A48ms stimulates metabolic pathways that increase glucose uptake without affecting the mitogenic MAPK cell proliferation pathway.

Aptamer Sciences has validated the potential of that mechanism. In murine models of type 1 and type 2 diabetes, A48ms showed excellent glycemic control. The animals experienced sustained glucose lowering with no hypoglycemia.

Having improved target selectivity and metabolic stability during lead optimization, Aptamer Sciences now has a preclinical-stage asset of significant promise. Aptamer Sciences is looking for out-licensing partners.

Bioneer

Bioneer is working on unlocking the power of RNAi molecules. RNAi is a potentially powerful modality that has been held back by issues that include safety and target specificity. Bioneer thinks that SAMiRNA, an abbreviation of self-assembled-micelle interfering RNA, can overcome those issues without encapsulation hassle. SAMiRNA is a novel type of RNAi molecule that can be assembled by itself into a nanoparticle.

Animals exposed to SAMiRNA do not experience any significant innate immune response or toxicity. Bioneer found no adverse preclinical toxicity or safety effects, even in acute and repeated-dose tests and other types of assessment with good laboratory practice (GLP) standards.

Preclinical work shows that this SAMiRNA-amphiregulin is suitable for treating idiopathic pulmonary fibrosis, which Bioneer plans to test in humans in 2020. Bioneer is endeavoring to form partnerships and out-license the SAMiRNA-based platform technology.

Oscotec

Unlike some of its peers, Oscotec is focused on a well-established modality, small molecules. Yet, through the use of a highly targeted approach Oscotec is finding innovative ways to use the modality.

The power of Oscotec's approach is shown by SKI-O-703, a selective, oral SYK inhibitor to treat autoimmune diseases. SKI-O-703 targets BCR and Fc receptors, setting it apart from JAK inhibitors that interact with immune cytokine receptors.

In preclinical trials, SKI-O-703 showed strong efficacy in rheumatoid arthritis (RA) and idiopathic thrombocytopenic purpura (ITP), as well as an excellent safety profile and wide therapeutic window.

Oscotec then ran studies in healthy volunteers in the US, giving it the data needed to move deeper into the clinic. Oscotec is now running two phase 2a trials, one in patients with RA that is unresponsive to existing therapies, and another for people with persistent and chronic ITP.

A rich source of drugs

Aptamer Sciences, Bioneer, OliPass and Oscotec are just a few of the KDDF-backed companies with promising assets. Collectively, KDDF's portfolio companies are working on innovative, first-in-class drugs in a range of modalities and therapeutic areas, making it a go-to resource for companies that want to bolster their pipelines.

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