

## **Kyowa Hakko Kirin Announces a Phase 1 Clinical Study of its IDO inhibitor in solid tumor, under a collaboration with Merck KGaA, Darmstadt, Germany, and Pfizer**

**Tokyo, Japan, November 2, 2018** – Kyowa Hakko Kirin Co., Ltd. (President and COO: Masashi Miyamoto, “Kyowa Hakko Kirin”) announces that the company has entered into a collaboration agreement with Merck KGaA, Darmstadt, Germany, and Pfizer Inc., to initiate a Phase 1 clinical study of Kyowa Hakko Kirin's novel IDO inhibitor, KHK2455, in combination with avelumab\*, a human anti-PD-L1 antibody for solid tumors.

Under the terms of the agreement, Kyowa Hakko Kirin will initiate a Phase 1 clinical study in the US, to evaluate the proof-of-concept of KHK2455 by combining with avelumab in patients with solid tumors.

“I am pleased to collaborate with Merck KGaA, Darmstadt, Germany, and Pfizer Inc. on this combination study,” said Mitsuo Satoh, Ph.D., Executive Officer, Vice President Head of R&D Division of Kyowa Hakko Kirin. “I hope we will find a new potential of KHK2455 through the clinical study.”

“We believe that the pathway to progress treatment outcomes lies in combination approaches, and we look forward to collaborating with Kyowa Hakko Kirin to investigate how combining avelumab with KHK2455 may improve patient care and outcomes,” Kevin Chin, Vice President, Global Clinical Development, Immuno-Oncology at the biopharma business of Merck KGaA, Darmstadt, Germany, which in the US and Canada operates as EMD Serono. “This is another key example of how we continue to focus on opportunities to advance combination trials with avelumab.”

“Evaluating and advancing the potential of immunotherapy combination approaches to support patients with challenging cancers is a key focus of our clinical development program for avelumab,” said Chris Boshoff, M.D., Ph.D., Senior Vice President and Head of Immuno-Oncology, Early Development, and Translational Oncology, Pfizer Global Product Development. “We look forward to working with Kyowa Hakko Kirin to explore this novel combination for patients with solid tumors.”

Avelumab has received accelerated approval by the US Food and Drug Administration (FDA) for the treatment of patients with metastatic Merkel cell carcinoma (MCC) and previously treated patients with locally advanced or metastatic urothelial carcinoma (mUC), and is under further clinical evaluation across a range of tumor types under a global strategic alliance between Merck KGaA, Darmstadt, Germany, and Pfizer Inc.

The Kyowa Hakko Kirin Group companies strive to contribute to the health and well-being of people around the world by creating new value through the pursuit of advances in life sciences and technologies.

\*Avelumab is under clinical investigation for treatment of solid malignancies and has not been demonstrated to be safe and effective for these uses. There is no guarantee that avelumab will be approved for additional solid malignancies by any health authority worldwide.

### **About KHK2455**

KHK2455 is a selective inhibitor of indoleamine 2,3-dioxygenase 1 (IDO1), which converts tryptophan to kynurenine and contributes to tumor escape from immunosurveillance. KHK2455 inhibits IDO1 apoenzyme with long-lasting and potent activity. KHK2455 inhibits kynurenine production in preclinical models and demonstrates synergistic inhibition of tumor growth in mouse tumor models with immune checkpoint inhibitors. KHK2455 is well tolerated and suppresses kynurenine production in a dose-dependent and sustained manner in patients with advanced solid tumors.<sup>1</sup>

### **About Avelumab**

Avelumab is a human anti-programmed death ligand-1 (PD-L1) antibody. Avelumab has been shown in preclinical models to engage both the adaptive and innate immune functions. By blocking the interaction of PD-L1 with PD-1 receptors, avelumab has been shown to release the suppression of the T cell-mediated antitumor immune response in preclinical models.<sup>2-4</sup> Avelumab has also been shown to induce NK cell-mediated direct tumor cell lysis via antibody-dependent cell-mediated cytotoxicity (ADCC) in vitro.<sup>4-6</sup> In November 2014, Merck KGaA, Darmstadt, Germany, and Pfizer announced a strategic alliance to co-develop and co-commercialize avelumab.

Avelumab is currently being evaluated in the JAVELIN clinical development program, which involves at least 30 clinical programs, including eight Phase III trials, and more than 9,000 patients across more than 15 different tumor types. For a comprehensive list of all avelumab trials, please visit [clinicaltrials.gov](http://clinicaltrials.gov).

### **Alliance between Merck KGaA, Darmstadt, Germany, and Pfizer Inc., New York, U.S.**

Immuno-oncology is a top priority for Merck KGaA, Darmstadt, Germany, and Pfizer Inc. The global strategic alliance between Merck KGaA, Darmstadt, Germany, and Pfizer Inc., New York, US, enables the companies to benefit from each other's strengths and capabilities and further explore the therapeutic potential of avelumab, an anti-PD-L1 antibody initially discovered and developed by Merck KGaA, Darmstadt, Germany. The immuno-oncology alliance will jointly develop and commercialize avelumab and advance Pfizer's PD-1 antibody. The alliance is focused on developing high-priority international clinical programs to investigate avelumab as a monotherapy, as well as in combination regimens, and is striving to find new ways to treat cancer.

### **References**

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