



September 29, 2020

**Joint Research on the antigen design for COVID-19 universal vaccines.**

Suita--- KOTAI Biotechnologies, Inc. (CEO, Kazuo Yamashita, hereafter referred to as KOTAI) today announced that it has entered into a Joint Research Agreement with Shionogi & Co., Ltd. (hereafter referred to as Shionogi) regarding the antigen design for COVID-19 vaccines.

Since the fiscal year of 2019, KOTAI has participated in a COVID-19-related project titled “Development of pathological diagnostic methods for congenital infections and unexplained illness of possible infectious etiology” (Representative institution: The National Institute of Infectious Diseases (hereafter referred to as the NIID)) supported by the Japan Agency for Medical Research (AMED). Since May 2020 KOTAI has implemented the Joint Research with NIID, Shionogi, and Osaka University regarding the immune profiles of COVID-19 patients, in which the analysis has been conducted from the viewpoint of protection from infection and then followed-up over long terms using immune cells in COVID-19 patients’ blood samples. In addition, KOTAI has acquired the additional research grants from AMED titled “Development of immune monitoring technologies for SARS-CoV-2 post-infected individuals” (Representative institution: KOTAI), and “Exploratory research on COVID-19 vaccine biomarkers based on immune profiling” (Representative institution: NIID), since October 2020 and April 2021, respectively. We continue our efforts based on our Immunoinformatics technologies to meet the ever-changing social needs.

The SARS-CoV-2 pandemic broken out in 2019 has entered a new phase for a fight against its mutant strains. It is seriously concerned that an escape from immunity induced by existing vaccines may occur in the future. We will implement the Joint Research to design antigens for a “universal vaccine” against SARS coronavirus infection based on our knowledge of the structure of the mutant strains. It is agreed with Shionogi that such design of antigens is extremely important to develop vaccines which are efficacious for prophylaxis or prevention of aggravation of infection of mutant strains for the future.

In this Joint Research, KOTAI will design antigens for the universal vaccine, and analyze immune reactions induced by the antigens. Shionogi will produce and assess their neutralization activities or wide range of the activities of antigens constructed with the information provided by KOTAI. KOTAI will receive initial payment from Shionogi as



research funds in the execution of the Agreement. In addition, KOTAI will receive a success fee based on criteria, and a royalty according to the sales amount if any vaccines using the antigens will be commercialized in the future.

KOTAI is a startup company founded in 2016 based on the research achievements at Immunology Frontier Research Center at Osaka University. KOTAI will work diligently to apply their proprietary bioinformatics and information/structure analysis technologies to SARS-CoV-2 and contribute to bringing the pandemic to a quick end.

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