For Immediate Release

Establishing an Automated System for the Analysis of SARS-CoV-2 in Wastewater

Joint press release by Hokkaido University, Robotic Biology Institute Inc., iLAC Co., Ltd., and Shionogi & Co., Ltd.

On March 19, 2021, Hokkaido University, Robotic Biology Institute Inc., iLAC Co., Ltd., and Shionogi & Co., Ltd. have entered into a memorandum of understanding (MOU) toward the establishment of an automated system for the analysis of the novel coronavirus (SARS-CoV-2) in wastewater.

The joint project aims to establish an automated analytical system that enables mass diagnosis by early detection of viral disease prevalence and mutants, based on wastewater-based epidemiology. The analysis operation is scheduled to start in April 2021 or later.

It has been suggested that the novel coronavirus (SARS-CoV-2) can propagate by infecting intestinal epithelial cells. SARS-CoV-2 has been detected in the feces of a significant proportion of infected individuals including those without gastrointestinal symptoms. SARS-CoV-2 excreted in the feces of COVID-19 patients eventually come together at wastewater treatment plants. Therefore, research into wastewater-based epidemiology (WBE) of SARS-CoV-2, which acquires population-level epidemiological information by routine monitoring of the virus in wastewater, has been accelerating across the world. WBE has been reported in scientific papers to be extremely useful for early detection of the spread of COVID-19 and the confirmation of successful mitigation of the disease prevalence in a given region.

In Japan, there have been fewer reported cases of COVID-19 infection per capita compared to the United States and some European countries and regions, and therefore, the concentrations of SARS-CoV-2 in Japanese wastewater tend to be lower than those in other countries. Hokkaido University and Shionogi entered into a collaborative research agreement in October 2020 to develop a virus detection method with an increased sensitivity. As a result of the collaborative research, a highly sensitive method of SARS-CoV-2 detection in wastewater has been successfully developed.

For societal implementation of WBE, the establishment of a high throughput analysis system of the collected wastewater samples is urgently needed. For this purpose, the Robotic Biology Institute, Inc. (RBI), and iLAC Co., Ltd., have joined the existing collaborations between Hokkaido University and Shionogi. RBI has the technology for automated SARS-CoV-2 detection/quantification and library preparation for next-generation sequencing (NGS) analysis using LabDroid “Maholo,” a versatile humanoid robot made in Japan; iLAC is capable of elucidating genomic information (e.g., viral genome mutations) based on massive NGS analysis. They will help develop an automated analysis system for WBE of SARS-CoV-2. The four parties have entered into an MOU toward societal implementation of WBE.

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Hokkaido University

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Founded in 1876 as Sapporo Agricultural College, Hokkaido University is one of the oldest, largest, and most prestigious universities in Japan. The university attracts prospective students all around the globe with the diverse degree programs offered and the all year round scenic beauty. The campuses are located in the cities of Sapporo and Hakodate of Hokkaido and 21 facilities are spread throughout Hokkaido and mainland Japan, contributing towards the resolution of global issues.
https://www.global.hokudai.ac.jp/

Robotic Biology Institute Inc. (RBI)

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RBI aims to accelerate research in the field of life science by developing the general-purpose humanoid robot LabDroid "Maholo". "Maholo" can reproduce the procedure of a skilled person repeatedly with the same degree of freedom as humans, and high-precision pre-analysis processing is possible by quantifying and optimizing the procedure. By conducting research with the general-purpose humanoid robot LabDroid "Maholo", researchers will be able to streamline the enormous cost and time required for cutting-edge research and improve the intellectual productivity of researchers.
https://rbi.co.jp/en/

iLAC Co., Ltd.

Shinji Irie, Director
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iLAC Co., Ltd. develops its unique comprehensive omics analysis platform for the scientific research of genome, gene expression, gene construction, proteomics and metabolomics. iLAC's omics analysis capabilities lead the rapid development and practice of Precision Medicine, where iLAC's proprietary multiple markers support more effective diagnostics of patient's disease status. iLAC's accumulated precise & comprehensive omics database contributes to the discovery of new therapeutic targets, the research for longer healthy life expectancy and the medical expense reduction efforts.
http://www.i-lac.co.jp/

Shionogi & Co., Ltd.

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Shionogi is committed to “protect people worldwide from the threat of infectious diseases” as our key focus. We are not limiting ourselves to the research and development of therapeutics, but are also pursuing total care for infectious diseases, through awareness building, prevention, diagnosis, and addressing exacerbations, as well as the treating the infection itself. As a leading company to fight infectious diseases, in order to contribute to the recovery of social security and safety through the early termination of COVID

19, we are working on the development of new therapeutic drugs and vaccines and maximizing the value of existing compounds. In addition, we will strengthen our efforts, including collaboration with external partners, to provide healthcare solutions to a larger number of patients.
https://www.shionogi.com/global/en/