

FOR IMMEDIATE RELEASE

Hitachi High-Tech and Institute of Science Tokyo Started Research on PFAS Detection

Tokyo, January 28, 2025 – Hitachi High-Tech Corporation ("Hitachi High-Tech") and Institute of Science Tokyo ("Science Tokyo") have been engaged in joint research on the detection of PFAS*¹ ("this research") using Hitachi High-Tech's proprietary cloud service "Chemicals Informatics" ("CI").

PFAS are resistant to heat, water and oil, and are widely used in all kinds of products, including household and industrial goods. On the other hand, they are difficult to break down which is causing problems, particularly in terms of water pollution as they accumulate in seawater and soil even after waste treatment. Furthermore, there are concerns that PFAS, which are not broken down and thus accumulate in the body as well as the environment, will be consumed in tap water, etc., leading to health issues in the future. However, the current method for detecting PFAS is complex and time-consuming, and improving efficiency of detection is challenging.

In this research, Hitachi High-Tech and Science Tokyo will explore methods to achieve simple and rapid detection of PFAS that may affect people's health. We aim to achieve efficient discovery and generation of peptides*² useful for PFAS detection through combining the peptide detection and identification technology from Science Tokyo with CI, Hitachi High-Tech's compound discovery support service using its proprietary database.

Through proof of concept work on this research, we will solve the challenges of detecting PFAS in order to provide safe tap water supplies and contribute to public health and safety.

*¹ PFAS: per- and polyfluoroalkyl substances

*² Peptide: A compound formed by two or more amino acids bound together. There are 20 natural amino acids, and there are many combinations of amino acids that make up peptides. We employ a method of discovering and designing peptides that interact with specific substances, and using them as sensors.

Background to This Research

Recently, health issues caused by PFAS in tap water have been reported, and various countries are working on regulating it. In Japan, policies on strengthening measures were fixed. For example, local governments and water companies may be required to conduct regular water quality inspections based on the law from 2026. Currently, PFAS are detected using liquid chromatograph mass spectrometers, but expertise is required for solvent extraction and concentration of target components, which requires several hours of pretreatment and measurement for a single analytical process.

With the frequency of PFAS detection expected to increase in the future, Hitachi High-Tech started research on simple and rapid PFAS detection in collaboration with Science Tokyo to improve the efficiency of PFAS detection.

Overview of This Research

Professor Takeshi Serizawa and Associate Professor Toshiki Sawada of the Department of Chemical Science and Engineering, School of Materials and Chemical Technology at Science Tokyo have been researching peptides to identify small differences in the structures of synthetic polymers, such as resins and rubbers. By combining these with a compound structure discovery service based on Hitachi High-Tech's CI, we can efficiently discover peptides that interact with extremely low concentrations of PFAS, and continue to verify the simple and rapid detection of PFAS. We will also verify the use of peptides that interact with PFAS for PFAS removal purposes.

Future Outlook

Hitachi High-Tech is committed to creating social and environmental value and providing solutions that contribute to solving social and customer issues, and is also focusing on developing technologies, creating new business and collaborating with partners that are essential to this aim. In this research with Science Tokyo, we will work toward solid results through proofs of concept and look forward to future commercialization, while continuing to contribute to building a sustainable society and improving people's quality of life.

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About CI

<https://www.hitachi-hightech.com/global/en/products/ict-solution/randd/ci/>

About Institute of Science Tokyo

Science Tokyo was established in October 2024, following the merger between Tokyo Medical and Dental University (TMDU) and Tokyo Institute of Technology (Tokyo Tech), with the mission of "Advancing science and human wellbeing to create value for and with society."

About Hitachi High-Tech

Hitachi High-Tech, headquartered in Tokyo, Japan, is engaged in activities in a broad range of fields, including manufacture and sales of clinical analyzers, biotechnology products, radiation therapy systems, semiconductor manufacturing equipment, analytical instruments, and analysis equipment. Also, we provide high value-added solutions in industrial fields such as mobility, connected, environment and energy, etc. Through business based on our core Observation, Measurement and Analysis technologies, we will contribute to the realization of a sustainable society by solving social issues.

The company's consolidated revenues for FY2023 were approx. JPY 670.4 billion. For further information, visit <https://www.hitachi-hightech.com/global/en/>

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