BioSpectrum
the business of Bio & Health Sciences
ASIA EDITION

NEC and Chugai Pharmaceutical use AI to potentially enhance cancer treatment in Japan

June 19, 2025 | News

NEC has built a system that predicts drug combinations by using in-house developed graph-based AI technology



Japan-based NEC Corporation, in collaboration with Chugai Pharmaceutical Co., has conducted an experiment using artificial intelligence (AI) to predict drug combinations that can possibly enhance the effectiveness of certain cancer treatments.

As a result, the time required to produce predictions may potentially be reduced by approximately 50% when compared to Chugai's conventional methods.

Drug combination therapy, in which two or more drugs are used in combination, is a promising option in the treatment of cancer. This therapy is expected to have a higher therapeutic effect than when single agents are administered. However, the prediction of drug combinations has conventionally required time-consuming manual research and analysis of information related to diseases, mechanisms of action, and indications based on vast amounts of publications and clinical trial data.

To resolve this, NEC built a system that predicts drug combinations by using in-house developed graph-based AI technology that leverages the vast amount of biochemical information and clinical trial data that is available from the AACT and ChEMBL databases.

By providing the system with the name of a target drug to be administered for a cancer treatment, it can quickly suggest candidate combinations to increase the efficacy of the target drug. The system also assists in understanding and validating prediction results by providing rationales about why certain combinations are selected.

In this experiment, information on approximately 400 combinations of cancer drugs was randomly extracted from the AACT. By using this information, NEC evaluated whether candidate drugs had the potential for clinical application and if they would enhance the effectiveness of a cancer treatment when administered with other drugs. As a result, NEC confirmed that the system can potentially reduce the time required to predict drug combinations by approximately 50%. NEC also confirmed that the drug combinations suggested by the system were accurate enough for possible use and that the basis for the predictions were highly convincing.