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Establishment of AI Technologies for Drug Screening
To Accelerate Data-Driven Drug Discovery

Mitsubishi Tanabe Pharma Corporation (MTPC) (Head Office: Osaka; President & Representative Director, CEO: Hiroaki Ueno) developed new AI technologies for drug screening by adapting the unique AI technologies of HACARUS INC. (HACARUS) (Head Office: Kyoto; CEO: Kenshin Fujiwara), an AI venture company, with the aim of accelerating data-driven drug discovery.

MTPC has been collaborating with Professor Jun Miyake at Graduate School of Engineering, Osaka University to develop AI technologies for drug screening by using deep learning. This AI technology enabled the evaluation of compounds using large-scale images without prior detailed experimental and analytical studies.

To further leverage AI technology, we had two challenges: "Scale-up of computing resources" and "Black-box AI problem". To address these two challenges, MTPC started to consider the use of HACARUS's unique AI technology in FY 2020 and concluded that the new AI system developed with HACARUS was useful for drug screening.

【Current Results】
① By utilizing sparse modeling*, MTPC and HACARUS solved the problem of increasing the size of computational resources and reduced the calculating time from 15 to 40 minutes per drug to about 16 seconds.
② Sparse structure learning enabled us to explain by estimating image features affected by drug exposure, avoiding the problem of black-box AI.

MTPC expects that these results will be applied to drug screening based on genetic polymorphism and drug screening using human iPS cells from patients in the future, contributing to the realization of precision medicine where MTPC focuses on "Medium-Term Management Plan 21-25".

MTPC will continue to take on the challenge of discovering drugs for diseases with unmet medical needs by utilizing various technologies.

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*This technology has a history of about 25 years. Although there are various stories about its origin, LASSO was advocated by Professor Robert Tibshirani at Stanford University, and became widely recognized in the fields such as data science. Research has advanced in academia to date, but there are still few practical and application examples in business.

■About HACARUS

HACARUS INC, founded 2014 in Kyoto, Japan is the leading provider of Explainable Lightweight AI Tools, backed by Osaka Gas and Miyako Capital (Kyoto University) among others. Its solutions are used in the Medical field to enable humans to make better, faster, and more reliable decisions, based on AI driven insights. HACARUS' proprietary AI engine is built using Sparse Modeling, an AI method that understands data like a human would – by its unique key features and is far more resource, time and energy efficient when compared to Deep Learning. To learn more, visit https://hacarus.com

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