Pharmacology, drug discovery, and drug treatment: thinking about the present and future of AI

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As a representative of the JST ERATO Ikegaya Brain-AI Hybrid Project, I would like to take a bird's-eye view of recent trends in the application of machine learning in the pharmaceutical field and its surroundings, including my own research concepts. My ERATO team aims to establish a novel interdisciplinary field, namely, "Wisdom Engineering", which could ultimately revise our understanding of the functions of the brain and artificial intelligence (AI) by elucidating how brains and AI can cooperate when brains and AI are directly connected (brain-AI hybrid). Based on three directions, i.e., AI-assisted brain function, brain-inspired AI designing, and brain-AI co-learning, we are exploring the potential and limit of the plasticity of brain-AI hybrids, thereby extending the functions of the brain and AI and expanding the definition of wisdom. Finally, we aspire to bring our research achievements closer to human society; that is, we aim to improve the productivity, health, welfare, and happiness of individuals by optimizing human behaviors and social structures.