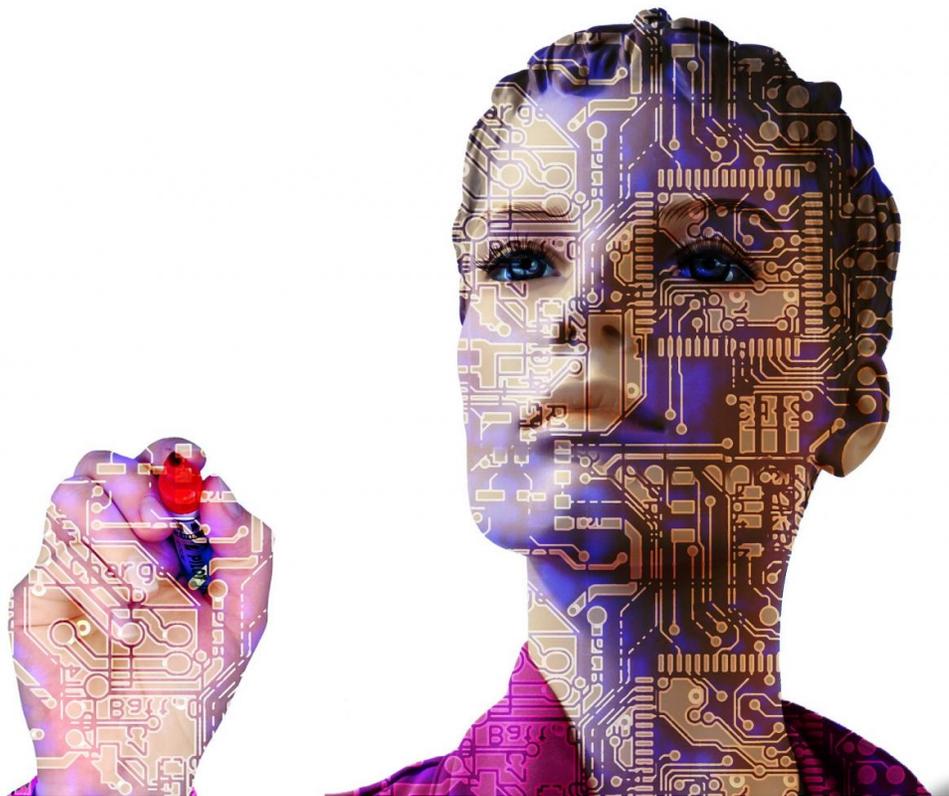


Will a machine pick your next medication?

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What once seemed like a scene from a 22nd century sci-fi movie is reality today. High speed, big data-processing computers combine artificial intelligence with human know-how to crack complex health

care conditions. This deep computer analysis may unveil new patterns that could bolster your provider's ability to prescribe precise therapies, make a diagnosis, recommend a clinical trial or even predict your risk of disease.

Mayo Clinic Center for Individualized Medicine (CIM) is collaborating with the Coordinated Science Laboratory (CSL) at the University of Illinois at Urbana Champaign (UIUC) to unleash the potential of artificial [intelligence](#) in patient care. Funded by a National Science Foundation (NSF) grant, the Mayo UIUC Alliance and corporate partners are conducting research into the big data challenge: how to develop computer systems that, combined with human intelligence, unlock new analysis of health and disease.

IDENTIFYING DEPRESSION THERAPY

Research within CIM is probing whether artificial intelligence can reduce or eliminate the trial and error of prescribing antidepressant medication. In a clinical study with Mayo's department of psychiatry, researchers have combined machine learning, a type of [artificial intelligence](#), with genomics, metabolomics and other clinical variables. This machine learning approach helps providers to choose a [therapy](#) most likely to work on the first try.

"We combined expertise from clinicians, engineers and biologists to create an algorithm that uncovered patterns of antidepressant response that each of these specialists alone might not be able to recognize," said Arjun Athreya, a Mayo- UIUC Alliance predoctoral research fellow. "Using this data with deep machine learning, we were able to predict with 75-85 percent accuracy whether a common antidepressant drug would work for each individual patient in the study. That compares to 58 percent accuracy when predictions are based only on clinical, demographic and social factors. In addition, we found that women and

men respond differently to this [antidepressant therapy](#)."

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