

# AI chatbot surpasses expert group in medical data analysis.

Research from UCSF and Wayne State suggests that AI-generated models can build predictive models for preterm birth faster and sometimes more accurately than human research teams.

AI-powered birthing tools have surprised researchers by building highly accurate models to predict preterm birth, much faster than human experts – and in some cases even better. This finding shows that AI can significantly shorten medical discovery time and improve the care of high-risk newborns.

In an early real-world experiment on the application of AI in health research, scientists at the University of California, San Francisco (UCSF) and Wayne State University found that AI-generated tools could analyze large medical datasets significantly faster than traditional research teams. In some cases, the AI even produced better predictive models than computer scientists who had spent months processing the same dataset.

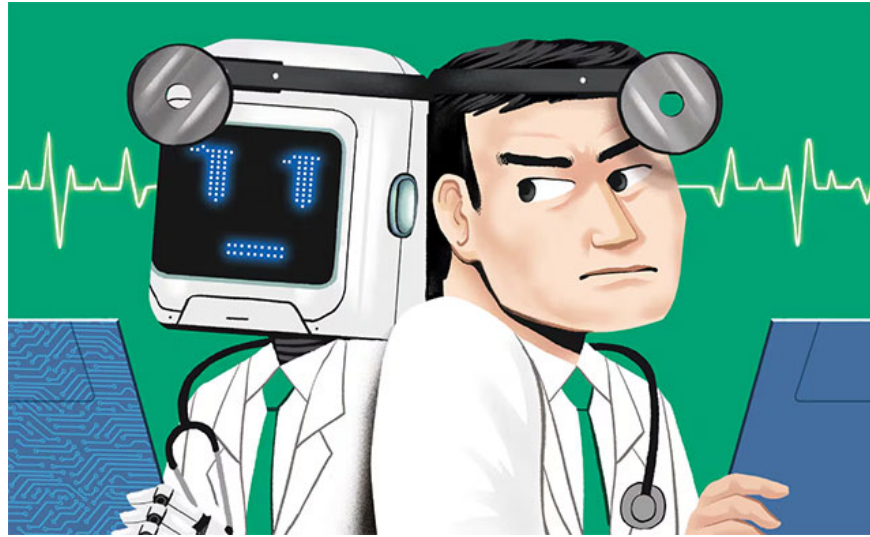
The research teams designed a direct comparison. Some teams relied solely on human expertise, while others combined scientists with AI. All were given the same task: to predict the risk of premature birth based on data from over 1,000 pregnant women.

Remarkably, even a relatively inexperienced team consisting of a UCSF graduate student and a high school student was able to build an AI-assisted predictive model. They produced working analytical code in just minutes – a task that would normally take hours or even days if undertaken by experienced programmers.

The biggest advantage of AI generation lies in its ability to create analytical code from concise technical requirements. However, not all systems perform well. Of the eight AI chatbots tested, only four generated usable code. Even so, the successful systems didn't require large teams of experts to oversee every step.

Thanks to this processing speed, the young research team was able to conduct experiments, verify results, and submit their papers to scientific journals in just a few months.

According to Marina Sirota, professor of Pediatrics and senior co-author of the study, AI could help address one of the biggest bottlenecks in data science: building analytical pipelines. The research was published on February 17 in the journal *Cell Reports Medicine*.



## **Why is predicting preterm birth important?**

Premature birth is the leading cause of death in infants and a major contributing factor to long-term motor and cognitive problems. In the United States, approximately 1,000 babies are born prematurely every day.

Despite its significant impact, scientists still don't fully understand the triggers for premature birth. To find an answer, Sirota's team collected microbiome data from approximately 1,200 pregnant women across nine different studies, following them throughout their pregnancies until delivery.

However, the sheer volume and complexity of the data made the analysis extremely difficult. Therefore, the team sought support through the global DREAM (Dialogue on Reverse Engineering Assessment and Methods) competition. Over 100 research groups worldwide participated in developing machine learning algorithms to identify patterns associated with preterm birth. Although the competition itself lasted only three months, compiling and publishing the results took nearly two years.

## **How can AI shorten the analysis process?**

To verify this, the UCSF team collaborated with researchers led by Adi L. Tarca at Wayne State. They asked eight independent AI systems to build algorithms from the same DREAM dataset, without any direct human programming assistance.

The systems receive requests in natural language but are meticulously designed, similar to how users interact with ChatGPT. The goal remains the same as in the competition: to analyze vaginal microbiome data for signs of preterm labor, and to evaluate blood or placental samples to estimate gestational age.

The results showed that 4 out of 8 AI systems generated predictive models with performance comparable to, and in some cases even superior to, the DREAM teams. The entire AI project – from initial idea to submission – took only six months.

However, researchers emphasize that AI can still produce inaccurate results and always requires human supervision. This technology does not replace scientific expertise. But by quickly processing massive amounts of data, AI allows researchers to spend less time debugging code and more time interpreting results and asking the

right biological questions.

In other words, AI could become a tool to accelerate medical research – especially in critical areas like premature birth, where every day that passes directly impacts the lives of newborns.

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