

URL: <https://stvp.stanford.edu/clips/where-is-ai-driven-bioengineering-headed-next>

Stanford professor Russ Altman emphasizes that AI is opening new opportunities to understand how medicines interact with specific proteins, and build more highly customized therapies. He points to DeepMind's AlphaFold 2 deep learning system as a particularly powerful new tool for re-envisioning how drugs are discovered and designed.



Transcript

- Everybody knows that AI is good at detecting patterns.. 00:00:06,780 And this can be very useful in looking at electronic medical records for finding a bunch of patients whose disease looks similar.. A lot of diseases are really waste bins of all different kinds of people with slightly different diseases.. And when you do a clinical trial, of course your drug is only gonna work on 20% of the people because 20% of them actually have a version of the disease where that drug is relevant and 80% might not even have the disease, or they just have a totally different form.. The AI systems are very good at finding patients who are kind of looking very similar along all available dimensions.. And that's also very valuable.. Now jumping very molecular we've all heard about AlphaFold 2.. AlphaFold 2 is the program out of DeepMind that was able to predict the three-dimensional structure of proteins.. I'll just remind people who haven't taken biology since high school, that those three dimensional proteins are typically what we call the targets of a drug.. A drug is often a small molecule that binds one of these proteins and modulates its function to help the patient have their disease go away or get better..

So, going from just some protein three dimensional structures to all of the structures, at least almost all, at a reasonable level of accuracy, opens up our ability to think about in a very rational way, new drugs to interact with proteins that we weren't able to think about previously, because we didn't have the structure.. And so that whole three dimensional structure and molecular understanding of drug action is about to be revolutionized.. I mean, it's happening right now.. I can't tell you how quickly engineering students read those papers, walked into my office and said, "I wanna work on the spin-out effects of that discovery."..