

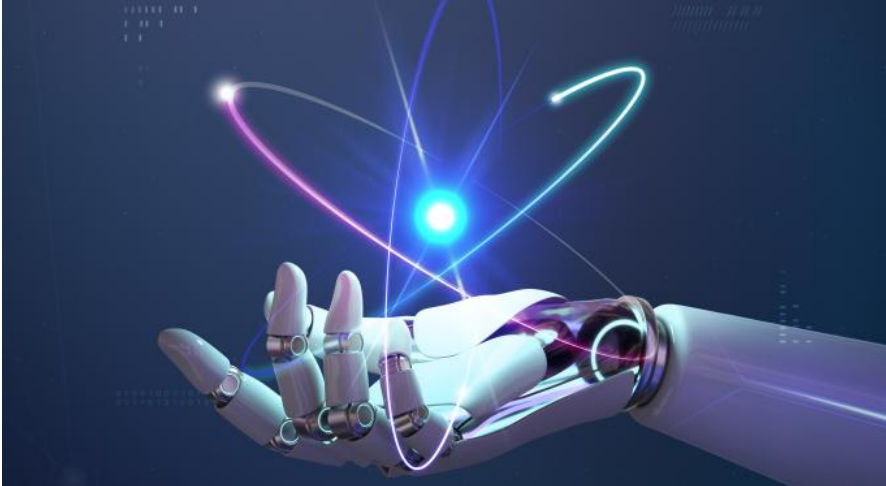
Y Combinator Startup Uses AI To Design New Drug-Induced States Of Consciousness

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A new psychedelics company, part of the 2021 Y Combinator alumni, has officially launched.

Mindstate Design Labs is a biotech startup focused on developing new drugs capable of inducing curated states of mind.

The company has raised \$11.5 million in a seed round and its initial achievement is a technology platform built to design altered states of consciousness using predictive artificial intelligence models.

If its AI model proves successful, **Mindstate will be able to first design a desired state of consciousness and then output the drug capable of producing it.** This model, however, still needs to be proven in human clinical trials.

An Inverted Approach To Psychedelic Drug Discovery

Mindstate Design is presenting itself to the world as a company with an alternative approach to drug discovery. While most companies in psychedelics drug development have a “drug-first” approach, Mindstate describes its approach as “mindstate-first.”

This means that **instead of first discovering a drug and then moving to identifying an indication for it, Mindstate plans to first design a state of mind, and then identify the chemical compound that can get the patient to that state.**

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CEO **Dillan DiNardo** explained in an interview that, while most classic psychedelic drugs (like LSD, DMT, psilocybin or mescaline) interact with the same serotonin receptor, the subjective experiences that these drugs produce are qualitatively different and cannot be fully explained by a simple interaction with the 5-HT2A receptor.

“It’s quite obvious that something else is going on,” says DiNardo.

His scientific co-founder **Tom Ray** has, for over two decades, been focused on understanding the interaction between the 5-HT2A receptor and other targets that psychedelics hit in order to perform targeted discovery of new psychedelic compounds.

While Mindstate is a drug development company, its first development is a tech platform dubbed the Osmanthus AI platform.

"The approach that we've taken in the Osmanthus tech platform is a combination of two large datasets," DiNardo said.

One dataset carries biochemical information related to how different psychedelic molecules interact with different receptors in the human body.

That first data set is then contrasted to a second data set consisting of accounts of subjective experiences of people under the effects of psychedelics. These range from descriptions from patients in legal clinical trials all the way to "trip reports" written by reddit users.

"So you can take these unstructured trip reports and pass them through natural language processing techniques in order to calculate the semantic distance between the different descriptors of the types of experience," DiNardo explained.

What that process outputs is "a quantitative representation of the biochemical fingerprints of each particular effect."

This allows Mindstate to connect the subjective psychedelic effects of drugs to the particular biochemical targets these drugs are hitting, and figure out their correlations.

An Unproven Model With Massive Disruptive Potential

Regardless of the company's innovative approach to "mindstate design," **the precise subjective effects of Mindstate's compounds will not be known until the company can apply its drugs on patients.** That's the only way to make sure that the theorized subjective experiences it has designed actually produce the desired effects.

The company's clinical trial design, however, carries a second layer of development with what DiNardo calls a "primer/probe" approach.

Each of the company's drug programs consists of one serotonergic psychedelic together with one non-psychedelic compound that modulates the effect of this first psychedelic compound.

"In this way, we can do this A-B testing or one by one, we look at the interaction of 5-HT2A with drug A, drug B, drug C; receptor A, receptor B, receptor C," says DiNardo.

This approach gives the company "the ability to more specifically design clinical trials" that can prove these correlations between biochemistry and subjective experience.

The company's lead drug development program looks to produce a less toxic version of MDMA, with less side effects or no side effects at all. However, **DiNardo says that the "true long term potential" of the company is in its tech platform** and its "ability to precision-design multiple states of consciousness, not only the altered states that we're already familiar with, but expanding the possible states to new novel states of consciousness that just don't exist yet."

Mindstate expects to wrap up its preclinical efforts soon and move over to clinical trials of its compounds by mid or late 2023.

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