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San Jose bioscience company launches research into Covid-19 treatment

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See Correction/Clarification at end of article

A San Jose biosciences firm that normally focuses on developing cancer drugs has launched a research initiative to find a treatment for Covid-19, the disease that has killed more than 175,000 people globally.

Anixa Biosciences Inc., a 38-year-old company with a market cap of almost \$41 million, has partnered with the German company OntoChem GmbH, which has developed the world's largest database of chemistry and structure information — a computer database containing around 1.2 billion molecules that have not been synthesized yet, but can be synthesized.

"If you were going to test out 1.2 billion molecules by testing them out in test tubes, that would take, you know, 100 years, so you just can't do that," Anixa CEO Amit Kumar told the Business Journal. "But you can use high-computational, high-powered computing as well as molecular modeling, and test out those molecules virtually or 'in silico' on a computer."

The crystal structure of the main protease of the virus that causes Covid-19 was just published a month ago, giving researchers the ability to study it for drug development.

The high-resolution structure, Kumar said, allows drug developers to see what each of the atoms of the protein are and how they are placed in relation to other arms, and what the binding site of the protein is.

Anixa is using molecular modeling to see whether any of the 1.2 billion molecules in OntoChem's database can bind to the active site of the protein, which would stop the virus from working. Kumar compared the process to searching for a matching puzzle piece or lock and key.

"Some of these molecules are not going to fit at all, but some of the molecules, we anticipate, will fit nicely," Kumar said. "We understand from a molecular modeling standpoint how the molecules rotate and how they bend and whatnot."

Kumar, who previously ran the company CombiMatrix Corp. when it was working on genetic products that monitored the original SARS virus' genome and mutations in the early 2000s, said Anixa is taking a different approach than other companies that are searching for a treatment for Covid-19.

Many of the drugs in clinical trials are all drugs that are repurposed from other diseases — either approved drugs like hydroxychloroquine and promising drugs that have not been approved, like Gilead Sciences' Remdesivir, which was developed for ebola but wasn't effective in treating that disease, Kumar said.

"While all of that is good, because we have this massive public health issue and because we've got this massive economic disruption that's occurring as a result, it makes sense that the industry would try to take things that are on the shelf and try and use them to see if they would impact the health concern," Kumar said. "However, we feel scientifically that if you want a really good drug for a particular disease the best way to do it is to start from scratch and design the drug against this specific virus."

Kumar said he expects the "discovery period" to take six months, followed by about three months of animal testing. If Anixa doesn't see any toxic side effects on the animals, human testing could start about six months later.



ANIXA BIOSCIENCES INC.

Amit Kumar is the chairman, president and CEO of Anixa Biosciences Inc. in San Jose.

"We think that this program could be ready by next fall — fall-winter timeframe, if the virus is still around at that time, which I think it will be," Kumar said.

Shares of Anixa closed 3.43 percent lower on Tuesday at \$1.94 per share, down 52 percent from a year ago.

Correction/Clarification

11:25 a.m. April 22, 2020: An earlier version of this story stated that the crystal structure of the virus that causes COVID-19 was published a month ago, when in fact the crystal structure of the main protease of the virus was published. The story also incorrectly stated that CombiMatrix Corp. developed drugs against the original SARS virus in the early 2000s. In fact, the company developed genetic products to monitor the virus genome and mutations. The story has been updated.

Allison Levitsky

Tech Industry Reporter
Silicon Valley Business Journal

