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BioCentury

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Emerging Company Profile

Adimab: Simplifying the antibody recipe

By Aaron Bouchie
Senior Writer

Adimab Inc. believes its yeast-based platform for discovering, maturing and producing human antibodies is faster and less cumbersome than conventional methods like phage display technology and *in vivo* mouse systems. Last week, the company raised an undisclosed sum in a series B round that it believes should be enough to integrate all the components of its platform and get it through 2009.

"Phage display technology has been widely used, but it only allows you to display fragments of antibodies. First you get the fragment in *E. coli*, then you find which one binds, then you need to engineer an antibody, then express that antibody in mammalian cells, then test to see if it still retained its function. We cut all that out and do it in one step," CEO Tillman Gerngross told BioCentury.

"We can test right away and find those antibodies that elicit a relevant biological or therapeutic function. There is a big difference between having binding peptides versus having full-length antibodies in a 96-well plate to test," he added.

Mouse systems for generating antibodies are more robust than phage display, but some human targets — especially small extracellular domains of transmembrane proteins — are difficult to raise antibodies against in an *in vivo* system, according to Gerngross.

It also may be necessary to knock out the mouse homolog that encodes the target, so that the animal's immune system won't be tolerized against the human target. "This is very cumbersome," he said.

Adimab is developing an antibody library in a yeast system that models the human immune system before tolerance has occurred, Gerngross said. The yeast are engineered with synthetic DNA constructs from **DNA2.0 Inc.** that encode antibodies.

Adimab Inc.

Lebanon, N.H.
Technology: Yeast-based discovery of human antibodies
Disease focus: N/A
Clinical status: N/A
Founded: 2007 by Tillman Gerngross and K. Dane Wittrup
University collaborators: None
Corporate partners: DNA2.0 Inc.
Number of employees: 24
Funds raised: Undisclosed
Investors: Polaris Venture Partners and SV Life Sciences
CEO: Tillman Gerngross
Patents: Undisclosed

The first step is to generate yeast that present full-length antibodies on their surfaces. These yeasts can then be screened to discover antibodies that bind to an antigen of interest.

Adimab also has three undisclosed methods for affinity maturation and optimization of the antibodies, and the yeast can secrete the antibody and be used for manufacturing.

However, every antibody that has gone through FDA has had human-like glycosylation, Gerngross noted, so it could be difficult to seek regulatory approval with unglycosylated antibodies from yeast.

One option would be to put the DNA sequence encoding for the antibody into a different expression system for manufacturing, such as mammalian cells or the yeast-based glycoprotein optimization system from GlycoFi Inc. Gerngross co-founded and was CSO of GlycoFi, which is now a part of **Merck & Co. Inc.**

Adimab is still in its early days and figuring out how to integrate all the components of its technology. "When we are up and running, I think you could come in with an antigen and we'll have purified human antibodies in one month," said Gerngross. He estimates that Adimab will be at that point within six months to a year.

"Clearly there is a big need for compa-

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nies that can generate antibodies, and that need is being met by different approaches. We're not saying we're going to be the only player, but we've picked a strategy that we think is best."

Adimab is in advanced discussions with potential partners, and Gerngross expects to announce a deal by the end of next quarter. He added that although M&A is on the table, that would not be the ideal outcome. Gerngross wants to do multiple deals and let partners take the technology in-house.

"The key is to prove to people that the technology is special, that we can pull out antibodies that no one else can," he said.

Indeed, Gerngross noted, the platform will enable a partner to know early on what it is getting with Adimab's antibodies. "We will give our partners an opportunity to buy out our royalties at a fraction of the net present value when the antibodies are still in preclinical testing," he said.

Adimab has not ruled out developing antibodies in-house, but that will not be the company's initial focus. "There is lots of good work being done in academia at discovering targets, but they are weak at developing antibodies against those targets. We will look at them as they come along and be opportunistic about in-licensing," said Gerngross.

Adimab raised $6.2 million in a series A round in July 2007, which was originally supposed to last until mid-2009. But it decided to ramp up hiring to be able to handle a large deal-load quickly, according to Gerngross.

COMPANIES AND INSTITUTIONS MENTIONED

Adimab Inc., Lebanon, N.H.
DNA2.0 Inc., Menlo Park, Calif.
Merck & Co. Inc. (NYSE:MRK), Whitehouse Station, N.J.