

Emerging Company Profile**Anaphore: Narrowing the focus**

By Aaron Bouchie
Senior Writer

Anaphore Inc. was founded in late 2007 to commercialize a protein engineering platform that had been the basis of now defunct Borean Pharma A/S. Anaphore believes focusing on specific products against a few carefully selected targets will help it succeed where Borean did not. Last week, the newco completed a \$25 million series A round to take its first product into the clinic.

The technology, which Anaphore has named TrimerX, is based on the human protein tetranectin, a trimeric plasminogen-binding protein whose three binding domains each contain five loops. By altering the amino acid sequence of these loops, Borean had developed a library of antibody analogs containing specific binders to virtually any target (see *BioCentury*, Sept. 27, 2004).

Anaphore calls the resulting proteins Atrimers.

"With these kinds of platforms, product selection and target selection are key to success. We saw an opportunity for immune-mediated diseases that wasn't being exploited" by Borean, said Chairman Andrew Schwab, founder and managing partner of 5AM, who spearheaded the transfer of Borean's assets to Anaphore.

"They were great protein engineers in Denmark who built and validated this platform. But to build a product portfolio, we needed a new product development team to take it forward. That's just the way companies evolve," Schwab said.

5AM purchased the technology, library and other assets from Borean in December 2007. The VC then brought in Versant Ventures to round out an \$8 million seed round in March 2008, which the newco used to buy the assets, transfer them to La Jolla, build a team and establish some product candidates. That seed money was converted into last week's series A round, which gave the company a total of \$25 million raised to date.

Anaphore is developing Atrimers against undisclosed targets for immune-mediated diseases such as inflammatory bowel disease (IBD), lupus, multiple scler-

Anaphore Inc.

La Jolla, Calif.

Technology: Atrimer class of protein therapeutics and TrimerX protein engineering platform

Disease focus: Autoimmune, cancer

Clinical status: Preclinical

Founded: 2007 by Katherine Bowdish, Richard Ulevitch, Andrew Schwab and Phyllis Whiteley

University collaborators: None

Corporate partners: None

Number of employees: <25

Funds raised: \$25 million

Investors: 5AM Ventures, Versant Ventures and Apposite Capital

CEO: Katherine Bowdish

Patents: 5 issued covering Atrimers and the TrimerX platform

osis (MS) and psoriasis. The company's secondary focus is oncology.

CEO Katherine Bowdish said the size and nature of Atrimers give the compounds biological, manufacturing and commercial advantages over other engineered protein therapeutics. Bowdish was co-founder and president of Prolifaron Inc., which became Alexion Antibody Technology Inc. after it was acquired by **Alexion Pharmaceuticals Inc.**

Atrimers are about 60 kD, compared with about 150 kD for antibodies. The smaller size means that only a single gene is needed to encode Atrimers, making production in bacteria possible. This is much easier and less expensive than manufacturing in mammalian cells, which is needed to enable multi-gene assembly and glycosylation for antibodies.

Tetranectin is not glycosylated. And because the human immune system already recognizes tetranectin, Anaphore expects no immunogenicity issues and has seen none yet in mouse studies.

Bowdish also said animal studies have shown Atrimers to be stable proteins with longer half-lives than marketed protein therapeutics.

"Because Atrimers are smaller than

antibodies, we expect to see better tissue distribution and better tumor penetration," she added.

Bowdish said Atrimers' three domains also should give the compounds better avidity for their targets than antibodies or peptides.

Schwab told BioCentury the TrimerX technology could be used against many kinds of targets, but the ability of tetranectin to bind specifically to trimeric targets was especially attractive.

"The key to the technology is there are many extracellular targets that are in a trimer format, like RANKL and TNF," he said.

The receptor activator of NF-kappa B ligand (RANKL) and the tumor necrosis factor (TNF) superfamily of targets are involved in autoimmune diseases and cancer.

According to Bowdish, the technology could be used to create heterotrimers and bi-specific homotrimers, although Anaphore is initially focusing on homotrimers against a single target. The company also has created fusion molecules using TrimerX, including fusions with other proteins as well as small molecules. These are in preclinical development.

All of these types of trimers are considered Atrimers.

Anaphore did not acquire Borean's Trimeric Apo A-I, which was sold to **Roche** in May 2006. Bowdish said the trimerized version of the naturally occurring apolipoprotein A-I is in late preclinical development at the pharma. The compound was developed using TrimerX.

Anaphore did receive Borean's anti-TNF therapeutic, which was in preclinical testing, although Bowdish said the company is not taking that one forward.

Bowdish is not sure which type of molecule will make it to Phase I testing first, but she expects it will take about two years and be in an immune-mediated disease. She said the series A financing should last about two years, and any partnerships will give the company more runway.

COMPANIES AND INSTITUTIONS MENTIONED

Alexion Pharmaceuticals Inc. (NASDAQ: ALXN), Cheshire, Conn.

Anaphore Inc., San Diego, Calif.

Roche (SWX:ROG), Basel, Switzerland