

Emerging Company Profile

Anaptys: Naturalizing antibodies

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Staff Writer

Using existing methods to isolate therapeutic antibodies with the desired biological activity can be lengthy, complicated and expensive. By harnessing natural biological mechanisms for creating antibody diversity, Anaptys Biosciences Inc. believes its Omnitope-SHM platform offers speed, cost effectiveness and technical advantages for both the discovery and optimization of therapeutic antibodies in a one-step process.

The company is using the technology to generate antibodies for its own account and also plans to conduct discovery and optimization against targets selected by partners.

"With many of the original players having been acquired or their technologies exclusively licensed for particular targets, and given certain technical limitations and complex IP and payment-stacking implications associated with these platforms, the industry needs new and more powerful antibody discovery and protein optimization approaches," Chairman and CEO Tom Smart told BioCentury.

"Our technology allows us to bypass the IP limitations and extensive royalty payments. Anaptys has harnessed the biological mechanism that nature uses to evolve and optimize antibodies, and we have put it into a dynamic, industrial platform," he said. "This technology, using successive rounds of selection and evolution, allows us to create novel, fully human antibodies with desired properties and performance characteristics."

Somatic hypermutation (SHM) is a natural process of immunoglobulin mutation that occurs in B cells and enables the rapid

Anaptys Biosciences Inc.

La Jolla, Calif.

Technology: Omnitope-SHM (somatic hypermutation) for antibody discovery and protein optimization

Disease focus: Inflammation, cancer

Clinical status: Discovery

Founded: 2005 by William Boyle, Andrew Cubitt, Kevin Kinsella and Nick Lydon

University collaborators: Medical Research Council; Albert Einstein College of Medicine; and UCSF School of Medicine

Corporate partners: None

Number of employees: 12

Funds raised: \$3 million

Investors: Avalon Ventures

CEO: Tom Smart

Patents: 2 issued covering a method for generating diversity in a gene or gene product by exploiting the natural somatic hypermutation capability of antibody-producing cells, as well as cell lines capable of generating diversity in defined gene products

variation and functional selection of antibodies against a target antigen. During B cell activation, SHM introduces sequence variation into the variable region of antibody structures, which are responsible for antigen binding. The end result is antibodies that have greater specificity and affinity for the antigen.

The Anaptys platform mimics this process. The company's antibody genes, selected from an in-house library, are trans-

ferred into cell lines in the presence of activation-induced cytidine deaminase (AID), the key enzyme that mediates SHM.

Anaptys uses a computational approach, using structure and functional data to predict which region of an antigen the antibody should bind to achieve the greatest potency. The company then iteratively screens for descendants from an evolving population produced through SHM.

According to Anaptys, static library approaches to MAb generation, such as phage display, are limited by a finite number of antibodies within the library. Also, MAbs must be optimized in a separate step. In the company's approach, the two steps are combined into one.

Moreover, said President and CSO William Boyle, "SHM yields a family of related sequences, and you can select potential lead candidates and rank them based on desired characteristics and activity."

It takes Anaptys three to four months to get from selection to optimization, while approaches such as phage display can take about six months to yield a potential antibody and another six months for maturation, Boyle said.

Preclinical testing of Anaptys' initial product candidates in undisclosed indications is slated to begin in 2008. Also by that time, the company plans to have generated a discovery pipeline for cancer, inflammation and other undisclosed indications. It anticipates seeking partners for some of its products at various stages of development.

Anaptys secured \$3 million in a series A round that will fund creation of a portfolio of product candidates and the start of preclinical testing. The company plans to raise a B round in the next 12 months.

Online links this week

Links to the following documents reside online at BioCentury's News Center at www.biocentury.com.

Compassionate use

CHMP guideline on compassionate use of medicinal products, including a summary of comments received on the draft guidance and a related Q&A.

Drug safety

FDA memorandum of understanding regarding a partnership

between FDA and the Department of Defense to share data and expertise to review the use medical products.

ESAs

Centers for Medicare and Medicaid Services (CMS) final National Coverage Decision (NCD) on erythropoiesis-stimulating agents for cancer and related neoplastic conditions (see "A Careful Wordsmith," A16).

Manufacturing

Draft EMEA guidance on comparability of biologics after a change in manufacturing process.

See page A22