IN brief

SBIR widens cash net

Biotech companies with venture capital backing are once again eligible for federal funding. In January, the US Small Business Administration (SBA) implemented changes to the federal Small Business Innovation Research (SBIR) program to broaden eligibility for firms owned by multiple domestic venture capital investors. “We applaud the [Obama] administration and the SBA for updating this program to support all emerging biotech companies,” says Jim Greenwood, president and CEO of the Biotechnology Industry Organization (BIO) in Washington, DC. Greenwood’s main concern is for its rapid implementation to enable a small majority of venture capital-backed companies to once again participate in the program. The new rules detail how to implement the SBIR/STTR Reauthorization Act of 2011, which extends SBIR through September 30, 2017. Although the law authorizes gradually rising funding for SBIR set-asides to support companies, that planned expansion is in jeopardy because of the threatened federal budget sequester and other plans that could reduce federal outlays for research through agencies such as the National Institutes of Health. Meanwhile, a new and related component of these programs, the Small Business Investment Company capital investment program has named its first licensee: Hatteras Venture Partners. The Research Triangle Park, North Carolina-based firm has raised \$125 million to invest in early-stage companies, and those private-sector resources are to be used in conjunction with \$1 billion from SBA over the next five years, dependent, of course, on forthcoming allocations of funds from Congress.

Jeffrey L. Fox

that emerge over time in response to infection or vaccination could also help researchers understand how pathogens flourish or perish in different patients and even lead to improved vaccine design. For example, in a recent study led by Stephen Quake from Stanford University, scientists tracked immune repertoire shifts after influenza vaccination in recipients of different ages by analyzing ongoing ‘evolution’ of antibody heavy chain sequences (*Sci. Transl. Med.* **5**, 171ra19, 2013). Quake has recently founded ImmuMetrix in Palo Alto, California, which will use similar strategies to explore how antibody repertoires are altered in different medical conditions. “Our informatic analysis approach allows you to really delineate the clonal expansion process,” explains Ning Jiang of the University of Texas (UT) at Austin, who was lead author on the influenza study and is on the ImmuMetrix scientific advisory board.

San Carlos, California-based startup Atreca is also pursuing antibody profiling to devise vaccines for challenging targets like HIV, malaria and tuberculosis—an effort that has benefited from generous support from the Bill and Melinda Gates Foundation in Seattle. “The foundation has invested \$6 million in Atreca, which establishes a long-term collaboration between both parties,” says Tito Serafini, the company’s CEO and CSO. Although still at an early stage, the company may have a valuable technological edge. Current repertoire-sequencing platforms generate numerous individual CDR3 sequences, but every antibody and TCR consists of two polypeptide chains, each with distinct CD3 elements. When this pairing

information is lost, accurate reconstruction of antibodies or TCRs of interest from sequence information alone becomes impossible. According to Serafini, Atreca has solved this problem, using a still-unpublished methodology licensed from Stanford immunologist William Robinson that retains chain-pairing information from individual immune cells. “Atreca employs proprietary technology to label all cDNAs originating from a single cell, for many single cells simultaneously,” says Serafini. “Within days, our technology can generate an unbiased and comprehensive set of natively paired antibody heavy and light chains.” Recently published work from the laboratory of George Georgiou at UT Austin describes another high-throughput, single B cell-based approach to rapidly sequence and retain the pairing information for the endogenous human antibody repertoire (*Nat. Biotechnol.* **31**, 166–169, 2013).

Although it’s still early days for most of these applications, the robustness of the core technologies involved—NGS and PCR—and the considerable progress in data analysis and deconvoluting large numbers of highly similar sequences has given these pioneering companies considerable confidence. “It’s pretty bullet-proof,” says Robins. And with vast quantities of repertoire data—and a number of clinical studies—now in the pipeline, many experts likewise express cautious optimism that these approaches may bring us our closest view yet of how our bodies deal with disease. “Compared to genomes, immune repertoires are a lot more personal,” says Holt. “This is truly personalized medicine.”

Michael Eisenstein, Philadelphia

IN their words

“If airlines agree to transport these dogs to Britain we will look to take action to disrupt their trade.” Unnamed British animal welfare activist on their latest attempt to bully airlines into not transporting

animals used in medical experimentation. (*The Guardian*, 14 January 2013)

“If Wal-Mart is at the table, that’s a big deal.”

Ronnie Cummins, director of the Organic Consumers Organization, commenting on a meeting among 20 major food retailers to discuss federal GM label law. (*The New York Times*, 31 January 2013)

Drug-proof grapefruit

Citrus breeders Fred Gmitter (left) and Chunxian Chen at the University of Florida’s Citrus Research and Education Center display new varieties of grapefruit and pomelo hybrids that could resolve the problem of grapefruit/drug interactions. The team developed the hybrid fruit as a cross between grapefruit and pummelo, a citrus species native to Southeast Asia. The hybrid, known as UF 914, has extremely low furanocoumarin content, which is thought to interfere with cytochrome P450 A34 enzyme involved in drug metabolism and P-glycoprotein.