IN brief

UCSD researcher shot by cofounder

On September 18, former Traversa Therapeutics CEO Hans Petersen went on a shooting spree. One of two people wounded was molecular biologist Steven Dowdy, a professor at University of California San Diego (UCSD) School of Medicine, in La Jolla, and cofounder of Traversa, according to a San Diego police report. Petersen has pled not guilty to charges of attempted murder and awaits trial. Petersen and Dowdy set up Traversa in 2006 to commercialize two promising short-interfering RNA (siRNA) delivery technologies licensed from Dowdy's UCSD laboratory. In 2010 the board of directors asked Petersen to leave, citing the growing complexity of operations, a decision Petersen blamed on Dowdy, according to the UCSD professor. But Dowdy says he had no vote on the board: "I was not the grand poobah of Traversa." Petersen's protracted departure coincided with a period in which the pharma industry shied away from RNAi research (*Nat. Biotechnol.* **29**, 93–94 (2011)). The company's main delivery technology, a fusion of a protein transduction domain and double-stranded RNA binding domain (PTD-DRBD), capable of chaperoning siRNAs through cell membranes to silence genes, only worked at low concentrations. But at the higher siRNA concentrations necessary for clinical trials, it precipitated, Dowdy says. Traversa developed an improved version by late 2011 and decided to focus on that, returning the license for the second siRNA delivery technology ribonucleic neutrals (RNNs) to UCSD. Even so, Traversa failed to attract Series C funding and in April 2012 filed for bankruptcy. Dowdy's UCSD laboratory meanwhile made more progress with RNNs. He and ex-Traversa CSO Curt Bradshaw have since launched another San Diego–based startup, Solstice Biologics, to capitalize on that technology. In January 2013 Solstice reported an $18-million Series A funding round. Dowdy is recovering from his gunshot wound and says he is "looking forward to getting back into my laboratory and doing science." *Lucas Laursen*

IN their words

"This requirement, which on its face looks reasonable, is for some reason highly controversial. Doctors…would welcome this information. Calpers [California Public Employees' Retirement System] and other large purchasers warn that the requirement itself would cast doubt on the safety and desirability of more cost-effective alternatives to biologics." California Gov. Jerry Brown ultimately vetoed SB 598, which would have required pharmacists to notify physicians when prescribing a biosimilar. The measure was being pushed by innovator companies and opposed by generics makers and insurers. (*The New York Times,* 12 October 2013)

Anti-infective monoclonals step in where antimicrobials fail

Officials of the Centers for Disease Control and Prevention (CDC) in Atlanta, issued a report in September on antibiotic resistance—the latest in a series of national and international efforts to document this global threat. "If we don't act now, our medicine cabinet will be empty and we won't have the antibiotics we need to save lives," says CDC director Tom Frieden. One key CDC recommendation (**Box 1**) to help control infectious diseases is to develop new anti-infectives. Biotech and pharma companies are responding—notwithstanding some foot-dragging—with renewed efforts to develop both conventional antibiotics and monoclonal antibodies (mAbs) and peptides (*Nat. Biotechnol.* **31**, 379–382, 2013).

Today, anti-infective mAbs, in particular, are poised for a resurgence. Nearly a decade ago (*Nat. Biotechnol.* **24**, 1491–1493, 2006), they seemed at the brink of commercial readiness. But several candidate mAbs then in clinical trials either failed trials or could not find traction during preclinical testing as anti-infective agents. Of some ten candidates then considered promising, Abthrax (raxibacumab) is the only such product from that group to gain approval—late in 2012—from the US Food and Drug Administration (FDA), evaluated under the terms of the FDA "animal rule" (*Nat. Biotechnol.* **31**, 8, 2013). This GlaxoSmithKline (GSK) monoclonal, which neutralizes toxins produced by the bacterial pathogen *Bacillus anthracis*, was developed by Human Genome Sciences, a Washington, DC–area biotech company that the London-based pharma purchased in 2012.

The FDA did approve an anti-infective mAb, Synagis (palivizumab), as early as 1998. It is used to prevent respiratory syncytial virus (RSV) infections in pre-term infants or other newborn children considered at high risk from this virus. Synagis was developed by MedImmune of Gaithersburg, Maryland, now a subsidiary of AstraZeneca in London.

Other candidates from the past decade are still going strong. An antimicrobial mAb pair, actoxumab/bezlotoxumab (MK-3415A), now in phase 3 clinical trials, could be headed for FDA licensing in 2015. The mAbs are directed against toxins produced by *Clostridium difficile*, a bacterial pathogen that causes recurrent diarrhea, and commonly affects elderly adults in hospitals or similar settings. The product is being developed by Merck of Whitehouse, New Jersey, under an agreement with Medarex of Princeton, New Jersey, a subsidiary of Bristol-Myers Squibb, and with Massachusetts Biologic Laboratory, a vaccine-manufacturing operation that is run by the University of Massachusetts.

Other antimicrobial mAbs now under development also target pathogen-associated molecules, mainly toxins or virulence factors but also other signature molecules such as carbohydrates that are arrayed along the surfaces of particular microbial pathogens. The two principal pathogens of interest for mAb developers are bacterial—one of them is the Gram-positive *Staphylococcus aureus* and the other is *Pseudomonas aeruginosa*, which is Gram negative.

Both pathogens can be difficult to control clinically because of acquired and intrinsic drug resistance and can be life-threatening. These two bacterial pathogens are major scourges in hospitals and similar settings, causing pneumonias and also soft tissue, or skin and wound infections, in the case of *S. aureus*, whereas *P. aeruginosa* is a major cause of pneumonia for individuals with cystic fibrosis and also infects the damaged skin and soft tissues of burn patients. Combined, these bacteria are estimated to infect 2 million US hospital patients per year

MedImmune was the first company to gain an FDA approval for an anti-infective monoclonal antibody: Synagis for resperatory syncytial virus. Here shown are MedImmune headquarters in Gaithersburg, Maryland.