

**Cidara Therapeutics Inc.: Cloudbreak™ immunotherapy platform and CD201 offer new hope to treat serious multi-drug resistant bacterial infections**

*Awarded \$3.9M over 13 months, and potentially up to \$3M in the following 11 months*

Cidara has created a proprietary immunotherapy discovery platform, Cloudbreak™, designed specifically to create compounds that direct a patient's immune cells to attack and eliminate bacterial, fungal or viral pathogens. CD201, a bispecific antibiotic immunotherapy, is Cidara's first Cloudbreak™ drug candidate being developed for the treatment of multi-drug resistant Gram-negative bacterial infections. Cloudbreak™ has the potential to transform infectious disease similar to the way immunotherapy has transformed cancer with the intent to produce new classes of antibacterials, antifungals and antivirals. Cidara (NASDAQ: CDTX) is a clinical stage biotechnology company headquartered in San Diego, CA.

**ContraFect Corporation: Antimicrobial lysins could potentially be a new weapon in the treatment of drug-resistant *Pseudomonas aeruginosa* infections**

*Awarded \$1.1M over 15 months, and potentially up to \$1.0M in the following 9 months*

ContraFect has recently discovered 48 novel Gram-negative lysins. Lysins are bacteriophage-derived enzymes with potent antibacterial activity against antibiotic-resistant pathogens, robust anti-biofilm activity, a low propensity for resistance development, and pronounced synergy when used in combination with conventional antibiotics in pre-clinical studies. The CARB-X award will support development of a potential treatment for invasive infections caused by *P. aeruginosa*. These studies will allow ContraFect to proceed with further IND enabling work and the identification of lysins active against other Gram-negative pathogens. ContraFect (NASDAQ:CFRX) is a Yonkers, N.Y.-based biotechnology company.

**Entasis Therapeutics Inc.: A novel oral antibiotic to treat patients with serious drug-resistant bacterial infections**

*Awarded \$2.1M over 9 months, and potentially up to \$4.2M in the following 12 months*

Entasis' anti-infective discovery platform has produced a pipeline of innovative preclinical and clinical programs which target Gram-negative bacterial infections. Entasis, in partnership with CARB-X, is addressing a significant unmet medical need: the lack of an oral therapy to treat multi-drug resistant Gram-negative bacterial infections, including those caused by carbapenem-resistant Enterobacteriaceae (CRE). Currently, many patients with CRE infections require hospitalization for intravenous therapy because antimicrobial resistance has rendered all available oral therapies ineffective. Entasis's novel oral agent has the potential to reduce or eliminate the need for hospitalization. Entasis is based in Waltham, MA.

**Forge Therapeutics Inc.: Pioneering chemistry platform for first novel class of 'superbug' antibiotics in decades**

*Awarded \$4.8M over 15 months, and potentially up to \$4M in the following 18 months*

Forge Therapeutics is a privately-held biopharmaceutical company in San Diego, CA, developing novel antibiotics to treat multi-drug resistant bacteria, or 'superbugs,' that have ignited a global health epidemic. With its proprietary chemistry approach, Forge develops small molecule inhibitors targeting metalloenzymes. Forge's lead effort is focused on LpxC, a zinc metalloenzyme found only in Gram-negative bacteria and which is essential for bacteria to grow. Forge has discovered novel small molecule inhibitors of LpxC that are potent in vitro, efficacious in vivo, and effective against drug resistant Gram-negative bacteria 'superbugs'. Learn more at [www.ForgeTherapeutics.com](http://www.ForgeTherapeutics.com).

**Microbiotix Inc.: Type III secretion inhibitors could boost the body's ability to fight bacteria and potentiate host defenses against resistant *P. aeruginosa* in pneumonia patients**

*Awarded \$1.6M over 12 months, and potentially up to \$1.6M in the following 12 month*

Microbiotix's unique approach to targeting drug-resistant Gram-negative bacteria focuses on bacterial virulence, specifically the type III secretion system of *Pseudomonas aeruginosa*. The novel inhibitors, discovered by Microbiotix scientists, have been shown to reverse the pathogen's disruption of the host innate immune response to infection and are not subject to efflux or existing antibiotic resistance mechanisms. Microbiotix's lead program, MBX-400, is a novel potent nucleoside dual DNA polymerase/kinase inhibitor for the management of cytomegalovirus disease in transplant patients and is Phase 2 ready. Microbiotix is based in Worcester, MA. For information: [www.microbiotix.com](http://www.microbiotix.com).

**Oppilotech Ltd: Using computational modeling to develop potentiators, which weaken the bacterial membrane and break antibiotic resistance**

*Awarded \$0.12M over 6 months*

Oppilotech is focused on the development of safe antibacterial compounds against drug resistant organisms. This approach entails developing potentiators – agents that can permeabilize the cell envelope allowing the use of established antibacterial compounds. To develop potentiators, Oppilotech has built the most detailed, accurate, computational network model of bacterial cell envelope (LPS, peptidoglycan & phospholipids components) biogenesis that has ever been assembled. The model has allowed Oppilotech to identify a protein involved in the synthesis of LPS found in Gram-negative bacteria that has unique features making it an excellent viable target for drug development. The CARB-X funding allows Oppilotech to undertake early stage experimental analysis of agents that can modulate this target to disrupt the envelope. Oppilotech is based in London, UK.

**Proteus IRC: New optical imaging technology could allow rapid and accurate diagnosis of bacterial infection in the lungs, and help speed up access to life-saving treatment**

*Awarded \$0.64M over 21 months, and potentially up to \$0.48M in the following 20 months*

The multidisciplinary Proteus team is developing technology to visualise bacteria and the host response in the deepest parts of human lungs in just 60 seconds, using bacteria-specific Smartprobes and fibre-based imaging. This potentially game-changing optical molecular technology will be used in critical care units, which are the largest consumer of antibiotics and an epicentre of antimicrobial resistance development in hospitals. Used at the bedside of patients who are mechanically ventilated and critically unwell, it will enable precision in diagnosing and prescribing, and has widespread applicability elsewhere in the human body for point-of-care bacterial detection and host-response monitoring. Proteus is based in Edinburgh, Scotland. For more information, see: [www.proteus.ac.uk](http://www.proteus.ac.uk).

**Redx Pharma Plc: Novel bacterial inhibitors target multi-drug resistant bacteria and hold potential for the treatment of serious hospital-acquired infections**

*Awarded \$1M over 18 months*

Redx has developed novel bacterial topoisomerase inhibitors which combine efficacy with an excellent safety profile against some of the most difficult-to-treat gram negative pathogens. Redx compounds from this series have demonstrated activity against a range of resistant bacterial species and have shown efficacy against a multi-drug resistant strain of *A. baumannii* in an animal model. With support from CARB-X, Redx aims to rapidly progress these compounds into clinical development with the goal of delivering to patients a new treatment for serious infections such as hospital-acquired pneumonia. Redx (LON: REDX) is headquartered in Alderley Park, UK, and is focused on the discovery and development of proprietary small molecule therapeutics to address areas of unmet medical need, principally in cancer, immunology and infection. By improving the characteristics of existing drug classes to create highly differentiated novel best-in-class drugs, Redx has already established a broad portfolio of proprietary drug programs. For more information: [www.redxpharma.com](http://www.redxpharma.com).

**Spero Therapeutics LLC.: Developing new combination drugs aimed at disrupting the Gram-negative bacterial membrane and allowing antibiotics to get their targets**

*Awarded \$1.6M over 12 months, and potentially up to \$5.4M in the following 24 months*

Spero's lead program, SPR741, also called Potentiator, is a platform approach to combination therapy to treat multi-drug resistant gram negative infections, such as Enterobacteriaceae and *Acinetobacter baumannii*, including carbapenem-resistant strains. SPR741 increases the spectrum and potency of more than two dozen classes of Gram-positive antibiotics to include activity against multidrug resistant Gram-negative infections when used in combination. As a

part of the CARB-X program, Spero will be screening antibiotic partners for SPR741, with the goal of identifying at least one partner to take through Phase 1 clinical trials. Spero is a clinical-stage biopharmaceutical company based in Cambridge, MA. For more information, visit [www.sperotherapeutics.com](http://www.sperotherapeutics.com).

**Tetraphase Pharmaceuticals Inc.: Clinical candidate TP-6076, a novel synthetic fluorocycline antibiotic, targets most urgent multi-drug resistant Gram-negative bacteria**

*Awarded \$4M over 18 months*

Tetraphase Pharmaceuticals uses its proprietary chemistry technology to create novel antibiotics for bacterial infections, including those caused by multidrug-resistant bacteria. The CARB-X collaboration will support the advancement of TP-6076. This phase 1 drug candidate is a novel, synthetic, fluorocycline antibiotic being developed for the treatment of serious and life-threatening bacterial infections, including those caused by pathogens otherwise resistant to current treatment options. It is highly active against clinically important Gram-negative pathogens, including carbapenem-resistant *Acinetobacter baumannii* and *Enterobacteriaceae*. Tetraphase (NASDAQ:TTPH) is a clinical-stage biopharmaceutical company based in Watertown, MA. For information: [www.tphase.com](http://www.tphase.com).

**Visterra Inc.: Developing antibody-drug conjugate as single-dose curative therapy, engineered to kill strains of deadly *Pseudomonas* bacteria**

*Awarded \$3M over 12 months, and potentially up to \$4.2M in the following 12 months*

Visterra applies its novel Hierotope® platform to design and engineer precision antibody-based biological medicines directed against disease targets that are not adequately addressed with conventional approaches. These targets include viruses and bacteria – which have a high degree of diversity among strains with frequent mutations – and proteins within the body. Using our platform we have designed, engineered and are developing an antibody that attaches to the deadly *Pseudomonas* bacteria and facilitates its killing. We combined our antibody with a potent anti-microbial peptide that we designed, resulting in a single molecule called an antibody-drug conjugate, which delivers a one-two punch to kill the bacteria. With funding and support by CARB-X, we are developing this antibody-drug conjugate as a single-dose curative therapy, engineered to kill all strains of the deadly *Pseudomonas* bacteria, including multi-drug resistant strains. Visterra is a clinical-stage biopharmaceutical company based in Cambridge, MA. For more information, visit [www.visterrainc.com](http://www.visterrainc.com).