Fiscal Year 2017 and 2018 Office of Antimicrobial Products Research Priorities

Public Health Impact:
As bacteria continue to develop resistance, standard treatment becomes ineffective and bacterial infections threaten global health. Therefore, there is an urgent need to develop new antibacterial drugs that are active against pathogens associated with antibacterial drug resistance and poor clinical outcomes to improve patient health and well-being worldwide.

FDA's roles in combatting antibacterial drug resistance are to: (1) facilitate the development of new antibacterial drugs to treat patients and (2) advance the science of clinical trial design.

Background:
In March 2015, The National Action Plan for Combating Antibiotic-resistant Bacteria (CARB) was developed in response to Executive Order 13676: Combating Antibiotic-Resistant Bacteria, which was issued on September 18, 2014. The National Action Plan outlines steps for implementing the National Strategy for Combating Antibiotic-Resistant Bacteria to address urgent and serious drug-resistant threats that affect people in the U.S. and around the world. Implementation of the National Action Plan will also support World Health Assembly resolution 67.25 (Antimicrobial Resistance), which urges countries to take urgent action at the national, regional, and local levels to combat resistance.

To facilitate the development of new antibacterial drugs active against multi-drug resistant bacteria, FDA recently led the following:
- July 18 - 19, 2016 FDA Public Workshop "Facilitating Antibacterial Drug Development for Patients with Unmet Need and Developing Antibacterial Drugs that Target a Single Species." Meeting materials can be reviewed at: http://www.fda.gov/Drugs/NewsEvents/ucm497650.htm
- December 13, 2016 FDA Request for Information "Develop Animal Models of Infection." The announcement can be found at: https://www.fbo.gov/index?s=opportunity&mode=form&id=d9928804bf9bde9c313a7eb5697a1945&tab=core&_cview=1
- March 1, 2017 FDA Public Workshop "Current State and Further Development of Animal Models of Serious Infections Caused by *Acinetobacter baumannii* and *Pseudomonas aeruginosa.*" Meeting materials can be reviewed at: https://www.fda.gov/Drugs/NewsEvents/ucm534031.htm.
- April 13, 2017 Advisory Committee Meeting "Developing Antibacterial Therapies Targeting a Single Bacterial Species." Meeting materials can be reviewed at: https://www.fda.gov/AdvisoryCommittees/Calendar/ucm551347.htm.

FDA/Office of Antimicrobial Products (OAP) Research:
The goal is to identify research areas where regulatory science can support new antibacterial drug development in general, by creating new drug development tools or standards for use by industry or other stakeholders, to meet patient needs. To advance the development of new antibacterial therapies for the treatment of serious bacterial diseases, FDA is exploring approaches to help stimulate development programs for antibacterial drugs where limited resources or a lack of incentives is preventing the development of new antibacterial drugs.

FY 2017 and 2018 Research Priorities
On February 27, 2017, The World Health Organization (WHO) announced its first list of antibiotic-resistant "priority pathogens" where new antibacterial drugs are urgently needed. *Acinetobacter*

baumannii and Pseudomonas aeruginosa were listed in the first-tier group or the highest priority category: http://www.who.int/medicines/publications/WHO-PPL-Short_Summary_25Feb-ET_NM_WHO.pdf?ua=1

In FY 2017 and 2018, the focus of OAP's regulatory science research is to advance pathways to develop drugs that could address an unmet medical need. Specifically, FDA is interested in research to advance regulatory science to facilitate the development of narrow-spectrum antibacterial drugs such as those that are active against only a single species of bacteria that may not occur frequently in any one type of infection/site of infection. When the species occurs infrequently, performing clinical trials can be extremely challenging. While every effort should be made to perform human clinical trials, animal models of serious bacterial infection are useful to explore the activity of a candidate antibacterial drug targeting a single species and may be further developed to help to predict whether the drug will be efficacious in humans. In addition, infections caused by *Acinetobacter baumannii* and *Pseudomonas aeruginosa* will be a high priority because there are limited therapeutic options to treat some patients with serious infections caused by these bacteria and it is difficult to enroll an adequate number of patients to conduct clinical trials.

Consistent with the CARB goals in the area of unmet medical need, fiscal year 2017 and 2018 research will focus on animal model development or animal model refinement for serious infections caused by *Acinetobacter baumannii* or *Pseudomonas aeruginosa*. Information can be found on FDA's Office of Antimicrobial Products Research Webpage (under Opportunities for Collaboration): https://www.fda.gov/OAPResearch.

In addition to animal model development, FDA is also interested in the following research topic areas:
- evaluate potential innovations in clinical trial design for new antibacterial drugs such as enrollment strategies, data collection streamlining, drug development tools, clinical endpoints, and new statistical analytic approaches
- advance the science of in-vitro, animal model, and/or pharmacokinetic studies to facilitate antibacterial drug development, including studies focused on drug development for special populations such as patients with unmet need, children and patients with renal or hepatic dysfunction
- evaluate strategies to enrich enrollment in clinical trials for new antibacterial drugs such as the use of rapid diagnostic tests
- advance the science of antibacterial drug susceptibility testing

Detailed information on the research activities can be found on FDA's Office of Antimicrobial Products Research webpage: https://www.fda.gov/OAPResearch