

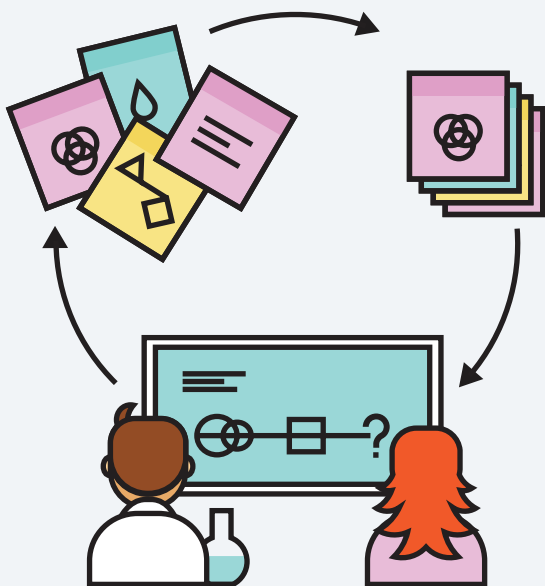


Q&A: Information-Sharing Platform to Fill Knowledge Gaps Impeding Antibiotic Innovation

Pew's publicly available database will help scientists build on previous research, generate new insights

Q: What is SPARK?

A. The Shared Platform for Antibiotic Research and Knowledge is a groundbreaking and dynamic information-sharing platform. It will bring together curated antibiotic discovery data and cutting-edge analytics to help scientists tackle the scientific barriers blocking antibiotics discovery. While the global threat of antibiotic resistance continues to rise, nearly every antibiotic in use today is based on a discovery from more than 30 years ago. SPARK will focus on the unique challenges of finding and designing antibiotics that can defeat drug-resistant Gram-negative bacteria, which are among the hardest-to-treat superbugs.



SPARK Can Advance Antibiotic Innovation

Interactive, publicly available database could help scientists tackle key research priorities

Antibiotic discovery findings are currently scattered across the academic literature or not published at all, making it difficult for scientists to build upon previous research.

SPARK collates and curates high-quality discovery data from multiple sources in a central online location.

SPARK's easy-to-use software enables scientists from around the world—across sectors and disciplines—to collaborate on and generate new ideas for finding urgently needed antibiotics.

Q: Why is Pew building SPARK?

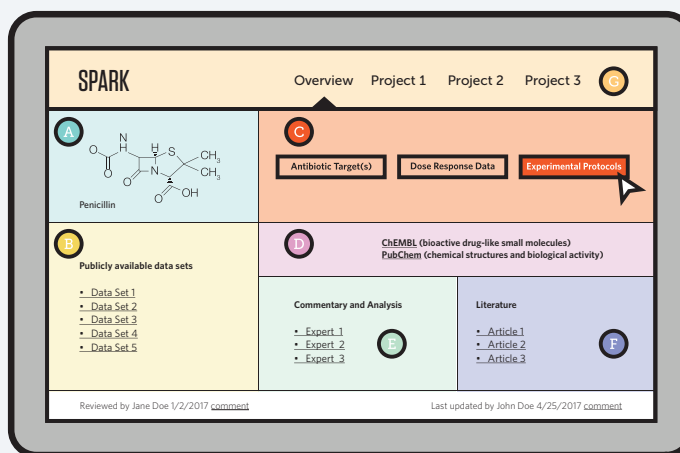
A. The pipeline of products in development to treat or prevent bacterial infections is stagnant and cannot meet today's urgent and growing patient needs. Leading experts have repeatedly identified information sharing as essential to spurring innovation; however, no publicly available mechanism currently exists for sharing information and expertise across the antibiotic discovery research community. As a result, invaluable knowledge and lessons learned are being lost, making it hard for researchers to benefit from the insights of others.

Q: What types of information will be included in SPARK?

A. The information in SPARK will be carefully collated and curated by a team of antibiotic discovery experts, and include chemical and biological data from past studies as well as analysis and commentary from leaders in the field. Initially, the data will be pulled from publicly available sources, such as published research articles, and be accompanied by related context and expert analysis. However, the platform will also have the capacity to host and integrate previously unpublished data as well as prospective research findings from studies still in progress at academic centers and drug companies.

SPARK's User-Friendly Interface Promotes Discovery Scientists can easily explore and analyze chemical and biological information by molecule type

- A** Chemical structure
- B** Chemistry information, such as high-throughput screening results
- C** Biological information, such as a molecule's activity against bacterial pathogens
- D** Public databases, such as PubChem and ChEMBL
- E** Expert commentary and analysis
- F** Published articles
- G** Collaborative project space

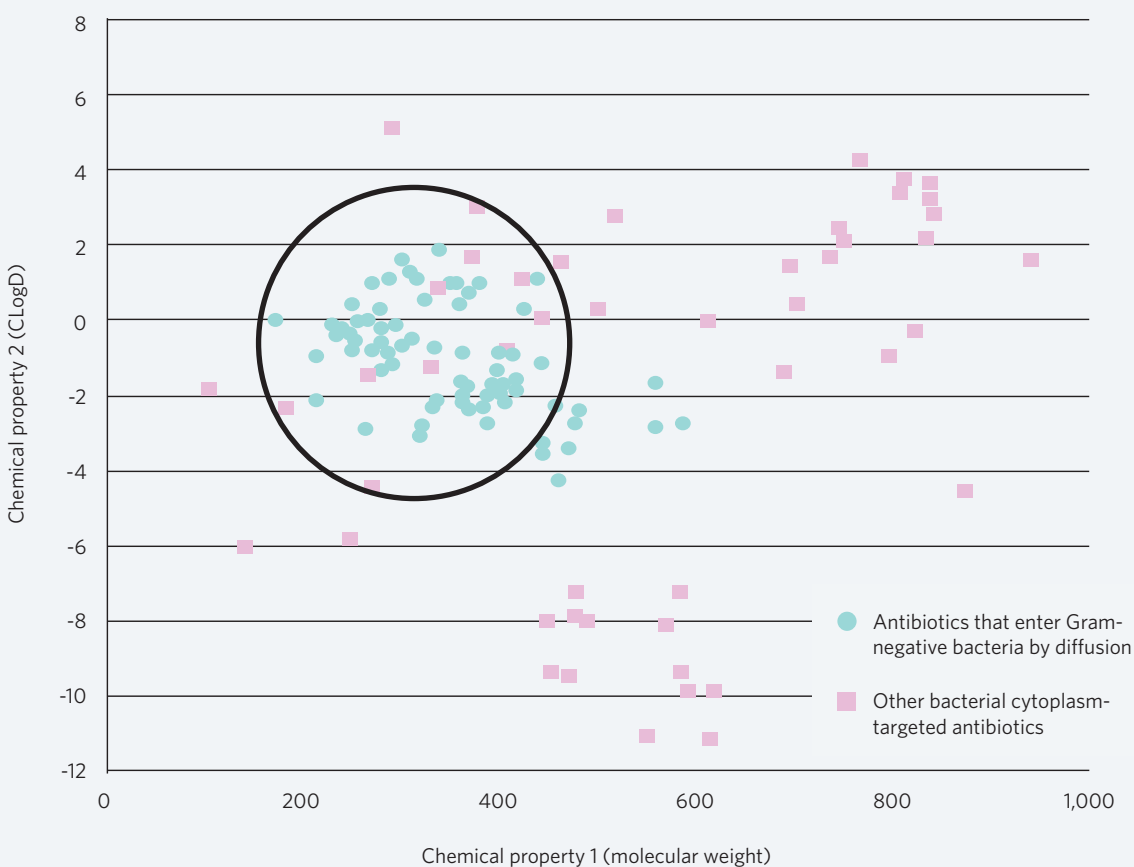


Q: How will SPARK work?

A. Through SPARK's user-friendly, cloud-based interface, experts from across disciplines (e.g., biologists, chemists, computational scientists) and around the world can work together to uncover new observations, generate and share new hypotheses on how molecules enter and stay inside Gram-negative bacteria, and identify the tools and additional information needed to advance discovery.

SPARK's Analytic Capacity Could Help Scientists Find and Design New Drugs

Scientists can look for patterns and make predictions about what types of molecules get into and stay inside tough-to-treat Gram-negative bacteria



Adapted from the following sources: Lynn L. Silver, "A Gestalt Approach to Gram-Negative Entry," *Bioorganic & Medicinal Chemistry* 24, no. 24 (2016): 6379-98; and Rosemarie O'Shea and Heinz E. Moser, "Physicochemical Properties of Antibacterial Compounds: Implications for Drug Discovery," *Journal of Medicinal Chemistry* 51, no. 10 (2008): 2871-78, doi: 10.1021/jm700967e

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Q: Who will use SPARK?

A. SPARK will be publicly available for use by researchers across disciplines and sectors—academia, industry, government, and nonprofits—from around the world that are focused on antibiotic innovation. SPARK will help cultivate the next generation of antibiotic discovery researchers, serving as a valuable resource in overcoming the challenges of “brain drain” and traditionally siloed information sources. This is particularly important given that antibiotic research programs have been abandoned or downsized in recent years, and findings from previous discovery efforts are often scattered across the academic literature or unpublished.

Q: How does SPARK compare to other information-sharing platforms?

A. Similar data-sharing tools have successfully catalyzed drug discovery in other research areas, such as cancer, neglected tropical diseases, and tuberculosis. Pew hopes that SPARK will do the same for antibiotic-resistant bacteria, using technology provided by Collaborative Drug Discovery.

Q: When will SPARK launch?

A. A pilot version of SPARK is expected to be publicly available on the Collaborative Drug Discovery website within the next year. Leading up to its launch, an initial round of antibiotic discovery information will be collated, curated, and augmented by commentary and analysis from leading scientists in the field. Pew will work with researchers to beta-test the platform prior to launch. Going forward, the goal is for SPARK to provide an impetus and nexus for inquiry and mentorship in a field desperately in need of a jump-start and help drive research efforts toward a more robust and sustainable antibiotic pipeline for generations to come.

For further information, please visit:

pewtrusts.org/spark-antibiotic-discovery

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