

Investing in New Research Strategies for Gonorrhea: Sample Bank Offers Treasure Trove of Resources for Scientists

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Gonorrhea's [resistance to drug treatment](#) is a common cause that unites today's sexually transmitted infection (STI) researchers. Just one recommended treatment remains: ceftriaxone. This urgency has prompted the development and implementation of projects such as CDC's [Gonococcal Isolate Surveillance Project \(GISP\)](#), [STD Surveillance Network \(SSuN\)](#), and [Strengthening the United States Response to Gonorrhea \(SURRG\)](#) initiatives; programs focused on staying ahead of this rising public health threat. These cooperative efforts are propelling a number of advancements in the [fight against drug-resistant gonorrhea](#)—at the center of which is data- and resource-sharing.

In addition to GISP, SSuN, and SURRG, for the last several years CDC has partnered with the Food and Drug Administration (FDA) to offer the [CDC & FDA Antimicrobial Resistance \(AR\) Isolate Bank](#)¹ as a resource for researchers in various disciplines such as academia, pharmaceuticals, biotechnology, and public health to access and share data to support innovation in drug development and pathogen detection. CDC has one of the largest collections of isolates gathered from national reference labs and tracking activities, taken from specimens in healthcare, food, and the community, including gonorrhea.

What is the AR Isolate Bank? A collection of resistant organisms grouped into distinct isolate (pure germ sample) panels, each curated with unique characteristics designed for specific analysis purposes.

"A goal of the AR Isolate Bank is to support our public health partners in their quest to successfully treat and prevent gonorrhea," said **Dr. Ellen Kersh**, Branch Chief of CDC's Division of STD Prevention (DSTDP) lab. "Academic labs can access the panels and help push research further along; drugmakers can use the panels for detection of biological markers to test for resistance and help fine-tune the drugs that are used to treat gonorrhea; and public health labs can use the panels to test and validate, i.e., ensure that what they are testing for is accurate, while also helping drugmakers learn if their drug is effective. Various organizations might use different research methods, but we are all united in one common purpose: investing in partnerships to drive effective gonorrhea treatment and prevention strategies for healthier communities and better overall public health."

Half of all gonorrhea infections each year are resistant to at least one antibiotic

The CDC & FDA AR Isolate Bank has 108 gonococcal isolates

Since 2016, more than 9,635 gonococcal isolates (277 panels) have shipped



Centers for Disease Control and Prevention
National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention

Interactive partnerships promote new drug development and accurate bug detection

The AR Isolate Bank actively supports scientific collaboration. For gonorrhea, researchers request specific sample panels to develop new drugs and analytical methods that address the dilemma of an STI that continues to evolve in ways that challenge the effectiveness of current treatments.

“Giving researchers the ability to directly analyze the dynamics of *Ng* resistance (*Neisseria gonorrhoeae*, *Ng*, the bug that causes gonorrhea) to drug treatments opens the door to developing more precise and accurate treatment solutions that will benefit public health in the years to come,” said Dr. Hsi Liu, an STI researcher in CDC’s DSTDP lab, which provides four distinct sets of panels through the CDC & FDA AR Isolate Bank that are specifically focused on supporting drug development to combat drug-resistant gonorrhea:

- the *Neisseria gonorrhoeae* Ciprofloxacin Panel of 14 isolates (developed by Liu),
- the *Neisseria* species MALDI-TOF Verification Panel of 30 isolates,
- the *Neisseria gonorrhoeae* Panel of 50 isolates, and
- the World Health Organization (WHO) *Ng* Reference Panel of 14 Isolates (developed by a worldwide group of WHO-affiliated scientists).

Dr. Cau Pham, also an STI researcher in the DSTDP lab, says innovation is a catalyst that stimulates progress in other labs around the world. The *Neisseria* species identification method using MALDI-TOF that Pham developed, for example, relies on highly specialized research equipment to differentiate *Ng* from other *Neisseria* non-gonorrhea species.

“It’s a powerful tool that strengthens diagnostic tests to improve the ability to identify *Ng* correctly. This and other specialized methods help scientists stay abreast of the tricky versatility that gonorrhea can exhibit.”

Fine-tuning public health protection

Simply stated, scientists working to counter the spread of drug-resistant gonorrhea make the right decision when they contact the AR Isolate Bank for resources, said **Dr. Matthew Schmerer**, a biologist in the DSTDP lab.

The entire process of generating isolate copies for sample panel distribution is a time-consuming, detailed protocol—lasting up to a month in some cases—but Schmerer sees it as a vital step in the drive to move the science forward in curbing the spread of drug-resistant gonorrhea. **“We embrace our role in the ongoing effort, and we’re committed to the cause. Accessibility and reliability of the sample panels are central components that make the whole research process work. By accessing the resources offered by the AR Isolate Bank, scientists all over the world contribute directly to, and benefit from, the very latest advancements in drug research to protect public health.”**



¹ Housed within the Antimicrobial Resistance Coordination and Strategy Unit of the Division of Healthcare Quality Promotion in CDC’s National Center for Emerging and Zoonotic Infectious Diseases

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