

Bacteria may be key to immunity, DNA manipulation

Bacteria's ability to destroy viruses has long puzzled scientists, but researchers at the Johns Hopkins Bloomberg School of Public Health say they now have a clear picture of the bacterial immune system and say its unique shape is likely why bacteria can so quickly recognize and destroy their assailants.

The researchers drew what they say is the first-ever picture of the molecular machinery, known as Cascade, which stands guard inside bacterial cells. To their surprise, they found it contains a two-strand, unencumbered structure that resembles a ladder, freeing it to do its work faster than a standard double-helix would allow.

The findings, published online on August 14 in the journal *Science*, may also provide clues about the spread of antibiotic resistance, which occurs when bacteria adapt to the point where antibiotics no longer work in people who need them to treat infections, since similar processes are in play. The World Health Organization (WHO) considers antibiotic resistance a major threat to public health around the world.

"If you understand what something looks like, you can figure out what it does," says study leader Scott Bailey, PhD, an associate professor in the Bloomberg School's Department of Biochemistry and Molecular Biology. "And here we found a structure that nobody's ever seen before, a structure that could explain why Cascade is so good at what it does."

Read the full, original story: [Harnessing the power of bacteria's sophisticated immune system](#)