

## Predatory bacteria – friend, foe or façade?

By Rebecca Hall

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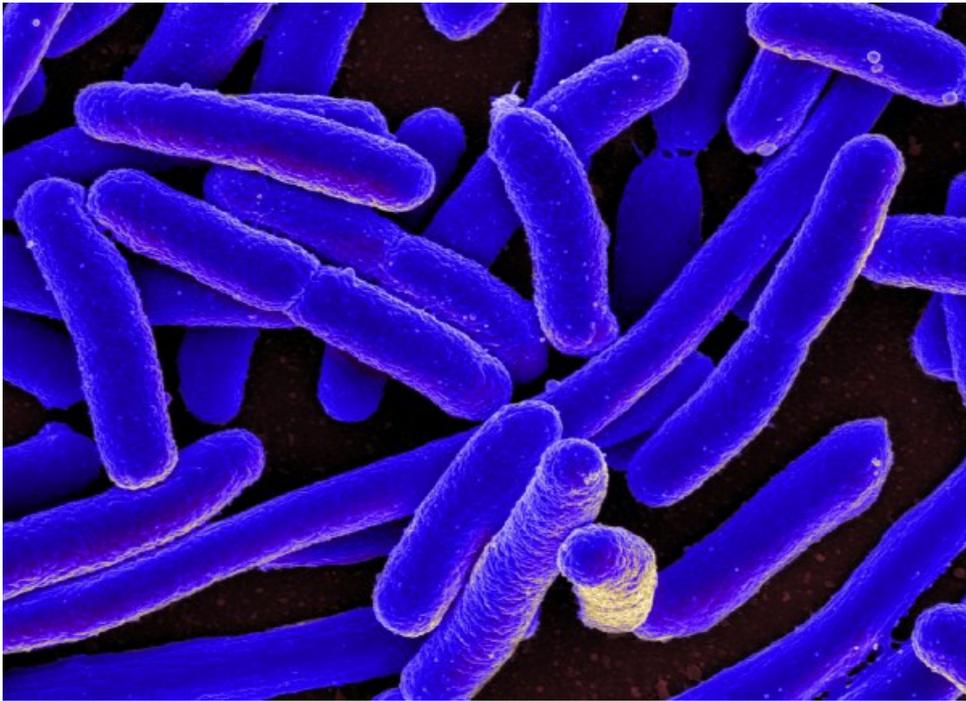


Image: Wikimedia Commons. Bdellovibrio bacteriovirus feed on the biopolymers, e.g. proteins and nucleic acids, of their hosts.

If it sounds too good to be true then it probably is. So when the BBC announced last week that “*predatory bacteria can wipe out superbugs*” it was met with a feeling of scepticism. The article suggested that a microbe called *Bdellovibrio bacteriovorus* could help ease fears of an *antibiotic apocalypse* by “devouring” the insides of bacteria that are resistant to multiple drugs. The paper in question is much more cautiously realistic about its ability to cure the world of superbugs any time soon though.

*Bdellovibrio* is a small, motile bacterium that hunts other bacteria, attaching to their surface before entering and forming a structure known as a *bdelloplast*. Four hours later, the infected cell bursts open and releases the *Bdellovibrio* harboured inside, allowing them to attack other cells. It is this predatory behaviour that the researchers suggest could be harnessed and used to treat infections that are resistant to all other lines of treatment.

The scientists found that introducing *Bdellovibrio* into zebrafish in isolation had no adverse effect on the survival rate of the fish. When they added a normally-lethal amount of drug-resistant *Shigella* to the mix they found that intriguingly, the *Bdellovibrio* seemed to assist the zebrafish immune system in clearing the pathogen. They believe it worked by reducing the number of *Shigella* to the point where the immune system could take over and clear the rest. The *Bdellovibrio* was also targeted after a longer period of time, seemingly producing no ill-effects of its own.

The biology behind *Bdellovibrio* is a very interesting one and serves neatly to highlight the quirks that you can find once you start digging a bit. The issue here is that, contrary to the BBC news report, it is very

unlikely to ever become a viable therapeutic option. First, it is hard to believe that patients would find the thought of receiving a dose of bacteria at the large quantity described in the paper a pleasant one. Second, no one would argue against the point that zebrafish and humans are not the most similar. Third, *Shigella* is not the most well-known of all multidrug-resistant bacteria and therein lies a flaw in the claims. That being said, the science behind predatory bacteria is fascinating and if it is making some kind of headline news then that can only be a good thing.

*Source - Injections of predatory bacteria work alongside host immune cells to treat Shigella infection in zebrafish larvae. Willis et al. 2016. Current Biology.*



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