

## Biologists manipulate cells with tiny bacterial ‘nanospears’

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Billions of years before hominids sharpened sticks into stabbing weapons, bacteria invented spears. Specifically, they invented *transforming* spears—structures that could almost instantly unfold from flat, coiled ribbons into long, pointed cylinders. They use these weapons to wage war on other microbes. And now, scientists—descendants of those early stick-sharpening hominids—are planning to tweak these bacterial javelins, and deploy them as tools for research, medicine, and more.

[The story of the spears](#) starts in 1938, with an American biologist named Tracy Sonneborn and his favorite organism—a hairy, single-celled, slipper-shaped organism called [Paramecium](#). Sonneborn discovered that some strains of *Paramecium* are exceptionally violent, and can kill their more sensitive peers by releasing small particles into their environment.

These weapons are proteins called ‘*Type 51 refractile bodies*,’ or R bodies for short. When the bacteria first produce them, they take the form of rolled-up ribbons. But in the acidic conditions on a paramecium’s vacuole, the ribbons extend from the inside, stretching out by almost 40 times and transforming into a long, tapered tube.

Many scientists have pieced together this fascinating bit of natural biology over the last eight decades. But when Jessica Polka of Harvard Medical School heard about the R bodies, she realized that she could repurpose them into tools for delivering specific molecules into cells. After all, that’s exactly what *Caedibacter* naturally use them for. “I thought we could further domesticate this natural protein machine, tune it to behave differently, modify, and manipulate it to make it work for us,” she says.

**Read full, original post:** [Biologists Steal Nanospear Technology From Bacteria](#)