In the developed world, where people are used to the luxury of safe drinking water flowing out of a tap on demand, cholera may seem to be a vanished scourge of the 19th century, made quaint by the passage of time. But *Vibrio cholerae*, the bacterium that causes this devastating disease, remains a very real threat in many developing countries. Infection can lead to severe diarrhea and dehydration, capable of killing untreated victims in a single day. Each year, cholera causes an estimated 120,000 deaths worldwide, plus many additional nonfatal cases.

*V. cholerae* continues to evolve, shifting its shape in ways that foil human immune responses.

"We don’t really know what *V. cholerae* does in its day job, when it’s associating with marine invertebrates,” says Edward Ruby, a microbiologist at the University of Wisconsin–Madison who studies the interactions of *Vibrio* with squid. “The situation we know most about is the acute infection of humans, which is not the bacterium’s typical lifestyle.”

**Moonlighting as a pathogen**

Epidemiologists and clinical microbiologists tend to see *V. cholerae* as shaped by its interaction with people. It’s the point where the germ connects with our own innards, and threatens our own survival, that naturally compels interest. But the bacterium spends most of its time elsewhere. Epidemic cholera may flare up for a year or two, then fade away for many decades. “Most of the time, it’s sitting somewhere else, in what we call a reservoir [because in] our self-centered way of thinking...nothing is doing anything interesting until it’s doing something with us,” says Ruby. “Basic *V. cholerae* biology has got to be tuned in to something else, because these bacteria clearly have not spent much of their time with humans over the last thousands of years.”

The tools *V. cholerae* uses to infect human hosts certainly can give the impression that this microbe has evolved to plague us. Pathogenic strains of the bacterium are equipped with genes that code for the production of cholera toxin, a protein that wreaks havoc with the salt balance of cells lining the small intestine. Toxin-damaged cells pump electrolytes and water into the lumen of the intestine, causing the severe diarrhea and dehydration characteristic...