

# Your showerhead slime is alive—and mostly harmless

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The day after Halloween, something scary may still lurk inside your

showerhead. Researchers at CIRES have identified *Mycobacterium* as the most abundant genus of bacteria growing in the slimy "biofilm" that lines the inside of residential showerheads—and some of those bacteria can cause lung disease.

In a new study, they report that mycobacteria are more prevalent in the United States than in Europe, thrive more in municipal tap [water](#) than in well water, and are especially common in geographical "hot spots" where certain types of lung disease caused by mycobacteria are also common.

It's important to understand routes of mycobacterial exposure, especially in the household. We can learn a lot from studying the biofilm that accumulates inside your showerhead, and the associated water chemistry," said Matt Gebert, CIRES researcher and lead author of the new study published this week in the American Society for Microbiology's journal *mBio*. "There is a lot of interesting ecology at work, and it allows us to begin to understand how it can impact human health."

The research team, CIRES Fellow and Professor of Ecology and Evolutionary Biology at CU Boulder Noah Fierer's group, began this work in 2017, funded partially by an CIRES Innovative Research Program grant. The team analyzed DNA collected from 656 household showers in the United States and 13 countries in Europe. Citizen scientists swabbed the inside of their showerheads with specialized kits, and mailed the "biofilm" samples to Boulder.

By harnessing DNA sequencing technology, the researchers were able to identify which [bacterial species](#) that lived in showerhead slime, and how abundant they were. Mycobacteria were far more abundant in showerheads receiving municipal tap water than in those receiving well water, as well as more abundant in U.S. households versus European.

These patterns are probably driven in part by differences in the use of

chlorine disinfectants, the team reported. Mycobacteria tend to be somewhat resistant to the chlorine-based disinfectants used more heavily in the United States than in Europe—so in Europe, other bacterial species may be better able to thrive and outcompete the disease-causing strains.

Showerhead materials seemed to matter, too, with more mycobacteria in metal showerheads than in plastic ones—plastic leaches some chemicals that support diverse bacterial communities, possibly preventing the mycobacteria from becoming too abundant.

When the researchers mapped out where potentially pathogenic [mycobacteria](#) thrived, the maps revealed "hot spots" that roughly match regions where a nontuberculous mycobacterial (NTM) [lung disease](#) is most prevalent—parts of Southern California, Florida, and New York, highlighting the potentially important role of these showerhead bacteria in disease transmission.

There is a fascinating microbial world thriving in your showerhead and you can be exposed every time you shower," Fierer said. "Most of those microbes are harmless, but a few are not, and this kind of research is helping us understand how our own actions—from the kinds of water treatment systems we use to the materials in our plumbing—can change the makeup of those microbial communities."

"In terms of what's next, we're hoping to begin to explore, beyond identification and abundance, what is causing this striking geographic variation within the genus Mycobacterium, and what is potentially driving these 'hot spots'," said Gebert.

"And don't worry," he added. "There is definitely no reason to fear showering."

**More information:** Matthew J. Gebert et al, Ecological Analyses of Mycobacteria in Showerhead Biofilms and Their Relevance to Human Health, *mBio* (2018). [DOI: 10.1128/mBio.01614-18](https://doi.org/10.1128/mBio.01614-18)

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