

SCIENTIFIC METHOD —

# Your office equipment can reveal the identity of your special someone

In pilot study, microbial “fingerprints” turn up on loved ones and office items.

BETH MOLE - 2/7/2017, 8:40 AM



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WASHINGTON, DC—Your computer keyboard and your significant-other likely have something in common: they're both marked by your microbial signature.

In a small pilot study, the living prints on oft-touched office equipment allowed researchers to pinpoint the individuals using them, as well as those individuals' romantic partners. Although microbial shedding has long been known to happen, the early results are a step forward in researchers' long-standing efforts to turn smatterings of our microbial companions into snitches to solve crimes.

Microbes offer a real advantage over DNA-based forensics, Katherine Bates, lead researcher of the study and a biologist at the US Air Force Academy, told Ars. “You can control whether you're leaving DNA behind,” she says. It's much harder to keep all your microbes in line. Bates, along with several cadets, [presented the work](#) at the American Society for Microbiology's Biothreats conference being held in Washington, DC this week.

In recent years, researchers have begun tracking the microbiomes of our indoor environments and how germs move onto and off of us. In 2013, researchers reported that the microbes on patients [quickly take over their hospital rooms](#) after being admitted. And last year, researchers showed that they could pick out the microbes that had [sloughed off a burglar](#) during a mock house break-in.

But right now, the techniques aren't quite ready for prime time, Bates said. Researchers

are just now at the “cataloguing” stage—taking inventory of what’s a normal microbiome for, say, a wall, a bedroom carpet, or a bathroom counter. In terms of our indoor worlds—what microbiome scientists refer to as the “built environment”—microbes tend to come from building materials; the outside, [such as soil microbes](#) that get tracked or blown in; and inhabitants, including humans, pets, and smaller critters—intruding roaches, ants, and dust mites. But we don’t have enough data to have a clear understanding of patterns and attributes of those invisible communities.

Bates and her colleagues tried to dive into all of this. In their small pilot study, they swabbed the Academy offices of 22 faculty members, plus the members themselves, their romantic partners’ palms, and their homes. In the offices, the team swabbed keyboards, computer mice, and desks. For the home swabs, the team swiped living room floors, bedroom floors, nightstands, and bathroom counters.

With a total of 264 samples, the researchers did a simple DNA survey of what germs were present and then created algorithms to assess patterns to match up objects, surfaces, and people.

Interestingly, when the researchers looked at home surfaces (nightstands, floors, counters, desks), the microbial patterns weren’t clear or specific enough to match the human occupants. But when researchers focused in on frequently touched objects—the keyboards and computer mice—they could almost always match them to their owner and the owner’s partner.

The finding is a step toward better forensics, Bates suggests. But there’s still a lot of really important questions to answer. For instance, it’s unclear how long a microbial signature will last on an object or how a signature could be discerned from objects touched by lots of people—like door knobs.

The hypothesis is that these microbial signatures could one day allow us to track people through space and time. This includes tracking a criminal’s path through hallways and doorways he or she went through during a break-in or using environmental microbes that a criminal has picked up on their person to assess where they’ve been. We’re not quite there yet, but we’re getting closer, Bates said.

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