Couples who live together share a lot of things: beds, bathrooms, food, toiletries. But one thing they might not expect to share? Skin bacteria.

In a study published Thursday in mSystems, an open-access journal of the American Society for Microbiology, researchers studied the skin microbiomes of 10 sexually active, heterosexual couples living together.

A microbiome is a mini-ecosystem of bacteria, fungi, viruses and other microorganisms living on and in the body. Each square centimeter of skin hosts between one million and one billion microorganisms, according to the study.

After analyzing 330 skin swabs collected from 17 parts of the body on each participant, the researchers found that each person significantly influenced the microbial communities on a lover’s skin.
In fact, computer algorithms relying on microbial data were able to accurately match couples with up to 86 percent accuracy.

“The most surprising aspect of the study was that we could identify a microbial fingerprint common to cohabiting couples,” Josh Neufeld, co-author and a biologist at University of Waterloo, wrote in an email.

And the part of the body most likely to host a microbial community shared by a couple: the feet.

The study didn’t examine causality, but the researchers say it’s likely microbes are picked up from skin and bacteria in the home. Humans shed over one million biological particles every hour, and it’s particularly easy to pick up new microbes on the feet — in the shower shared with a partner, for instance, or walking barefoot around the home.

Most of the bacteria found on skin is harmless or beneficial, preventing pathogenic microbes from inhabiting the area. But little is known about this ecosystem.

“The more we know about factors that influence the human microbiome, including microbes coating our skin, the more we understand about the barriers that protect our bodies from disease, train our immune system and connect to the environments that we inhabit,” Dr. Neufeld wrote.

Other factors, like gender, influence a person’s microbiome even more than proximity to a partner, researchers said. A sample taken from one part of a person’s body will match a sample from another part of her body more closely than it will matches her partner’s.

But a lover still plays an important role in shaping your microbial profile, said Ashley Ross, co-author of the new study and a master’s student in biology at the University of Waterloo. “It’s not the main influence, but it’s one more piece of the puzzle.”

In addition to the feet, sexual partners share similar microbial communities on the torso, navel and eyelids, the study showed. Some of that exchange might occur
from sleeping in the same bed and sharing sheets, Ms. Ross said.

She and her colleagues also found that the microbial communities on a person’s inner thigh were specific to gender. Computer algorithms were able to differentiate between men and women with 100 percent accuracy by analyzing these samples alone.

It may have to do with the fact that the bacteria on women’s inner thighs are influenced by the vaginal microbiome, Ms. Ross said.

Given the small sample size of 20 participants, it’s difficult to generalize the results to all populations, she and her colleagues said. It would be useful to study same-sex couples in the future, as well as couples of various ethnicities and races.

Eventually, Dr. Neufeld said, the findings may have practical applications for the design of public and shared spaces to reduce the spread of pathogens between individuals.

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A version of this article appears in print on August 1, 2017, on Page D2 of the New York edition with the headline: Perfect Matches: Invisible Gifts From One Lover To Another.