

More than meows: How bacteria help cats communicate

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Cats, like many other animals, use scent to communicate with each other. A new UC Davis study characterizes the range of scent chemicals from cats and the bacteria that make them. Credit: UC Davis

Many mammals, from domestic cats and dogs to giant pandas, use scent to communicate with each other. A new study from the University of California, Davis shows how domestic cats send signals to each other using odors derived from families of bacteria living in their anal glands.

The work was published Nov. 8 in [Scientific Reports](#).

The study adds to a growing body of research on the relationship between microbes and odor in mammals, including [domestic dogs](#), [wild animals](#) such as foxes, pandas and hyenas, and humans.

Cats' scent comes from a mix of volatile organic compounds, including aldehydes, alcohols, esters and ketones. While mostly undetectable to human noses, these scents are important in cats' behavior and social lives. They mark territory, attract mates and repel rivals.

Connie Rojas, a postdoctoral researcher working with Professor Jonathan Eisen at the UC Davis Department of Evolution and Ecology and Genome Center, led a three-part study of anal gland secretions from [domestic cats](#). They used DNA sequencing, [mass spectrometry](#) and microbial culturing to look at the chemicals in the secretions and the microbes that make them.

The subjects in the study were 23 domestic cats seen at the UC Davis Veterinary Medical Teaching Hospital for elective procedures such as dental cleaning. Owners gave written permission for their cats to take part in the study.

Highly variable microbiome

Five genera of bacteria (Corynebacterium, Bacteroides, Proteus, Lactobacillus and Streptococcus) dominated overall, but the microbial makeup was highly variable between individual cats. Older cats generally had a different microbiome from younger animals. There were also some apparent differences in cats assessed as obese, but the sample size was not large enough to confirm this. Microbial populations might also be affected by factors such as the cat's diet, health conditions and its overall living environment.

Looking at the chemicals produced in the anal glands, the researchers detected hundreds of organic compounds. Genetic analysis showed that the bacteria living in the anal gland could be responsible for making these compounds.

The researchers hope to continue and expand the study to include more domestic cats as well as other species of cats.

Additional co-authors on the study, all at UC Davis, are: David Coil, Genome Center; Stanley Marks, School of Veterinary Medicine; Eva Borrás, Mitchell McCartney and Cristina Davis, Department of Mechanical and Aerospace Engineering and UC Davis Lung Center; and Hira Lesea, Department of Microbiology and Molecular Genetics.

More information: Connie A. Rojas et al, Characterization of the microbiome and volatile compounds in anal gland secretions from domestic cats (*Felis catus*) using metagenomics and metabolomics, *Scientific Reports* (2023). [DOI: 10.1038/s41598-023-45997-1](https://doi.org/10.1038/s41598-023-45997-1)

Provided by UC Davis

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