

Emerging virus in raccoons may provide cancer clues

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Rare brain tumors emerging among raccoons in Northern California and Oregon may be linked to a previously unidentified virus discovered by a team of researchers, led by scientists from the University of California, Davis. Their findings, published today in the journal *Emerging Infectious Diseases*, could lead to a better understanding of how viruses can cause cancer in animals and humans.

Necropsies conducted since March 2010 by scientists at the UC Davis School of Veterinary Medicine and UC Davis-led California Animal Health and Food Safety Laboratory found [brain tumors](#) in 10 [raccoons](#), nine of which were from Northern California, the article reports. The 10th was sent to UC Davis by researchers at Oregon State University in Corvallis, Ore.

The common factor, found in all of the tumors, was a newly described [virus](#), dubbed raccoon polyomavirus. Researchers suspect this virus contributes to [tumor formation](#).

Polyomaviruses, which are prevalent but rarely cause [cancer](#), do not typically cross from one species to another, so the outbreak is not expected to spread to people or other animals.

Two more raccoons with the tumor and the virus have been found in Yolo and Marin counties since September 2012, when the article was submitted to the journal for publication.

"Raccoons hardly ever get tumors," said study author Patricia Pesavento, a pathologist with the UC Davis School of Veterinary Medicine. "That's why we take notice when we get three tumors, much less 12."

Polyomaviruses are known to cause cancer under laboratory conditions. Less is known about their ability to cause cancer under natural conditions among people, because cancer often takes decades to develop.

Raccoons, with their short lifespans of two to three years, can provide a model for studying how these viruses spread outside the laboratory, how they cause cancer, and how easily they can jump from species to species.

Of the 12 raccoons affected, 10 were collected from Marin County. Pesavento said this does not mean the virus is limited to that county, or even to Northern California. Marin County is home to WildCare, an animal rescue and rehabilitation center that routinely submits animal remains for diagnostic testing, which might result in a sampling bias.

Other California raccoons were submitted by Lindsay Wildlife Museum in Contra Costa County and Sonoma Wildlife Rescue. Pesavento said her lab is collecting specimens and data from other sources across the country, looking for the virus and for raccoon exposure to it.

Pesavento said more research is needed to understand whether an environmental toxin, genetics or other explanation is contributing to the cancer. The study said that raccoons are exposed daily to human waste, garbage, environmental toxins and environmental pathogens as they travel along sewer and water lines.

"This is just the beginning of a story," said Pesavento, adding that high rates of cancer among wildlife are found in animals that live in close proximity to humans. "Wildlife live in our fields, our trash cans, our sewer lines, and that's where we dump things. Humans need to be

guardians of the wildlife-human interface, and raccoons are important sentinel animals. They really are exquisitely exposed to our waste. We may be contributing to their susceptibility in ways we haven't discovered."

Infectious pathogens, such as viruses, are associated with 15-20 percent of all human cancers worldwide, according to the American Cancer Society. For example, human papillomavirus can lead to cervical cancer. Feline leukemia virus, for which UC Davis developed a vaccine, can cause cancer in cats. UC Davis also continues to study Marek's disease, a deadly virus in chickens that is providing insight into human cancer.

"This work to investigate natural associations of cancer verifies the importance of our One Health approach to addressing complex biomedical problems, such as viral causes of cancer," said Michael Lairmore, dean of the School of Veterinary Medicine, of which the UC Davis One Health Institute is a part. "Understanding how infectious agents may contribute to cancer in animals has provided fundamental new knowledge on the cause of cancer in people."

Provided by UC Davis

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