

# Man's new best friend: What cats can teach us about human genetics and precision medicine

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Although cats have lived alongside humans for millennia, it remains a

dogs' world. This bias has historically bled into science as well. It's time for cats to get their day, argues veterinary medicine expert Leslie Lyons in a Forum published July 28 in the journal *Trends in Genetics*. Cats, she says, have the potential to be a valuable model organism for geneticists, as the feline genome is ordered similarly to humans.

"Using cats in research is really overlooked, since people don't realize the advantages," says Lyons, of the Department of Veterinary Medicine & Surgery at the University of Missouri. "The dog or [mouse genome](#) have rearranged chromosomes that are quite different than humans, but the [domestic cat](#) has [genes](#) that are about the same size as humans, as well as a [genome](#) that, like humans, is very organized and conserved."

Lyons writes that cats could be an asset for helping researchers better understand our genetic "dark matter." Although making up 95% of our DNA, it has long been considered filler information of little to no consequences, yet approximately 10% of the noncoding regions within the dark matter of the genome are conserved across mammals, suggesting that it has an important, misunderstood role. Cats have been found to have [genetic diseases](#) related to dysfunction of their genetic [dark matter](#), making them a potential model organism for this type of research.

"As we discover that perhaps animals have more similar spacing between genes and the genes are in the same order, maybe that will help us to decipher what's going on with humans," Lyons says. "Working with a primate is on the expensive side, but a cat's affordability and docile nature make them one of the most feasible animals to work with to understand the [human](#) genome."

Another reason why cats could enlighten the human genome is that we have the technology to clone cats and make transgenic cats. The first cat clone, Cc, short for CopyCat, was generated in 2001. Her cell donor was

a typical calico cat with black, orange, and white fur, but Cc didn't turn out to have any orange on her coat, defying Mendel's laws and other basic genetic principles. This was a clue that something was happening in Cc's genes that researchers are just now beginning to understand.

Cats could also play a role in precision medicine for genetic diseases, in which instead of treating the symptoms, researchers fix the actual gene and what the gene does. For example, certain breeds of cats are prone to the genetic illness [polycystic kidney disease](#), which also afflicts humans. Lyons writes that if we could treat this disease with precision medicine in [cats](#), we could apply those learnings to us.

"So, if you and your cat walk in the vet's door and there is not a trauma, there is not a feeding problem, there might be a genetic problem with the cat. Vets could sequence the genes and potentially more quickly find the cause of what's going on and then develop a treatment that is more appropriate than just treating the symptoms," Lyons says. "We can provide a more tailored healthcare program for our pets, and more funding would put all the different pieces into place."

**More information:** *Trends in Genetics*, Lyons, L.: "Cats - telomere to telomere and nose to tail" [www.cell.com/trends/genetics/f...0168-9525\(21\)00142-6](http://www.cell.com/trends/genetics/f...0168-9525(21)00142-6) , DOI: [10.1016/j.tig.2021.06.001](https://doi.org/10.1016/j.tig.2021.06.001)

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