

DNA Unlocks Mystery of Diverse Traits in Dogs

Scientists can now identify the genetic basis for variations in a dog's traits.

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When it comes to explaining the diversity of dog traits, a new study says it's all in the genes. Sheepdogs herd and retrievers retrieve because they are preset to do so, according to a team of international scientists.

Dogs vary in size, shape, color, coat length, and behavior more than any other animal, and until now, these diverse traits have largely been unexplained. Researchers have found a way to identify the genetic basis for the differences that might benefit dogs and their owners.

This breakthrough reveals areas in a dog's DNA that contain genes that scientists believe lead to variations in body and skull shape, weight, fur color and length – and possibly behavior, trainability and longevity.

The study involved the use of simple genetic markers known as SNPs, or single nucleotide polymorphisms, to find places in the dog genome that connect with breed traits. Because many traits are “stereotyped” – or fixed within breeds – scientists can zero in on these “hot spots” to see what specific genes are in the area that might lead to trait differences.

Study co-author Paul Jones, Ph.D., a Mars Veterinary genetics researcher, said this study, which was published in the journal *Genetics*, helps scientists piece together the canine genome puzzle. “By applying this research approach, we may be able to decipher how genes contribute to physical or behavioral traits that affect many breeds,” Jones said.

The research used 13,000 dog DNA samples provided by Mars Veterinary. The scientists said this study may also have implications for human health, as dogs suffer from many of the same diseases that people do.