

Collie Rescue of Southeastern Pennsylvania, Inc.

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Collie Rescue of
Southeastern Pennsylvania
PO Box 493
Ambler, PA 19002

215-793-9298

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In this issue we bring you something a little different. We talk about the 6-degrees of separation that seems to link every human being on the planet. Look long enough and you are likely to find no more than that amount of separation between you and any other person who you may encounter on the street. In this issue of our newsletter, we bring you an article by a guest writer, on the relationships of collies to other breeds.

6-Degrees of Lassie

The population genetics of the collie dog

By Felice L. Bedford, Ph.D.

Recent research on the genetics of dog breeds finds new information pertaining to the origins of our favorite furry friend, the collie.

The collie's closest genetic relative is the Shetland sheepdog. This may come as no surprise to you because the Shetland wears the same luxurious fur coat as the rough collie. However, these types of overlapping traits often turn out to be superficial, arising independently in different breeds that are unrelated to one another. In this case though, the physical resemblance between the dogs turns out to be more than fur deep.

Thirteen additional breeds are found to be in the same genetic clade as the collie. The closest cluster consists of the Australian Shepherd, Cardigan and Pembroke Welsh corgis, border collie, kelpie, bearded collie, Australian cattle dog, and the old English sheepdog. This means that every single collie, Shetland, corgi and so on in the world shares a common canine ancestor who lived just a few hundred years ago, much like how



you share a great great grandparent from the 1800s with your cousins. A few hundred years is very recent in dog history compared to the initial domestication from wolves more than 10,000 years ago.

Beside perhaps a herding instinct, do breeds of the collie clan have anything else in common from all their shared genetic variants? The more distant members of the UK rural clade (the official name of the collie clan), for example, greyhound, Scottish deerhound and borzoi, are especially thought provoking. Shared genes can produce common behaviors, physical features, diseases, or just be a silent remnant of common geographic origin. No one has really delved into that question yet for this big 15-member clan. Perhaps the next time you are missing a dose of collie, you can try playing with, say, a Scottish deerhound and see if anything feels familiar. Let me know!

In a presentation of the "Genealogy of Dogs" 60 years ago, before modern genotyping was possible, there was instead said to be three siblings of the collie on the "family tree of 114 dog breeds", the German Shepherd dog (now known to be distant), the briard (also distant) and the old English sheepdog (remains a close cousin). Interestingly though, the German shepherd dog does have a notable relation to the collie; it

turns out each is connected to the Australian shepherd. This was found using a type of genetic comparison that I like to call Six Degrees of Lassie, named after the game Six Degrees of Kevin Bacon.

As with the connection to the German Shepard dog, the most interesting findings about the collie from genetic analyses may come from the Six Degrees of Lassie comparisons to breeds from other clades. A lucky collie (or Shetland sheepdog) was a founder of the Nova Scotia duck tolling retriever. Thus, collie's genes live on in every member of that breed. In addition, intriguingly, the collie shares a genetic variant with a very new breed of dog, the chinook, and likely the very ancient rare breed, Xoloitzcuintli. The mystery of how gene flow came about has yet to be completely unraveled.

Interested in solving this and other collie capers? DNA tests for dogs are now available commercially just like the popular tests for people that use saliva to discern genetic ancestry. Genetic tests can include autosomal DNA, the majority of DNA inherited from both parents, as well as mitochondrial DNA (mtDNA) that you and your pup get only from your respective human and canine moms. I have started extending my human mtDNA studies due in large part to my undeniable adoration for the collie.

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Felice Bedford is a professor at the University of Arizona in the field of Perception. She got her degrees from the University of Pennsylvania and her collie from New Jersey



Partnering

In February of this year, Collie Rescue League of New England took in 19 collies whose owner was no longer able to care for them. Most of this large group tested positive for heartworm and many also had other health conditions needing attention.

Collie Rescue of SEPA was able to sponsor some of the care required for one of these special rescues thanks