

BREED MIX



GENETIC STATS

Wolfiness: 0.6 % **LOW**

Predicted adult weight: **28 lbs**

Life stage: **Young adult**

Based on your dog’s date of birth provided.

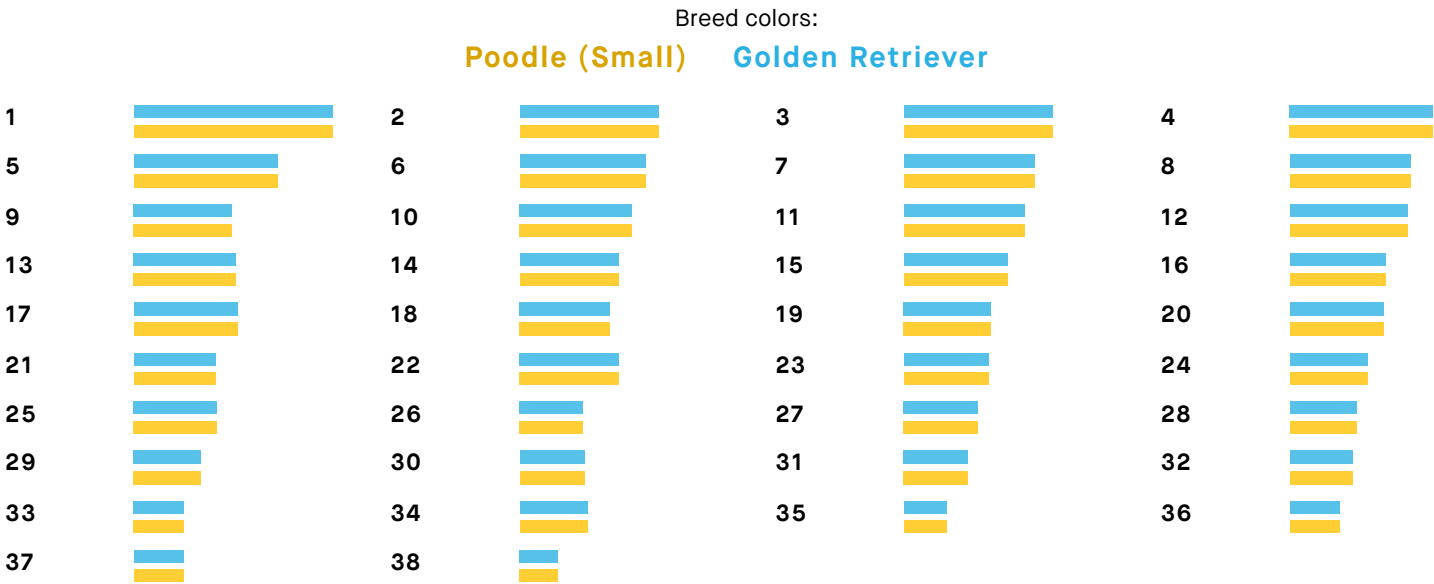
TEST DETAILS

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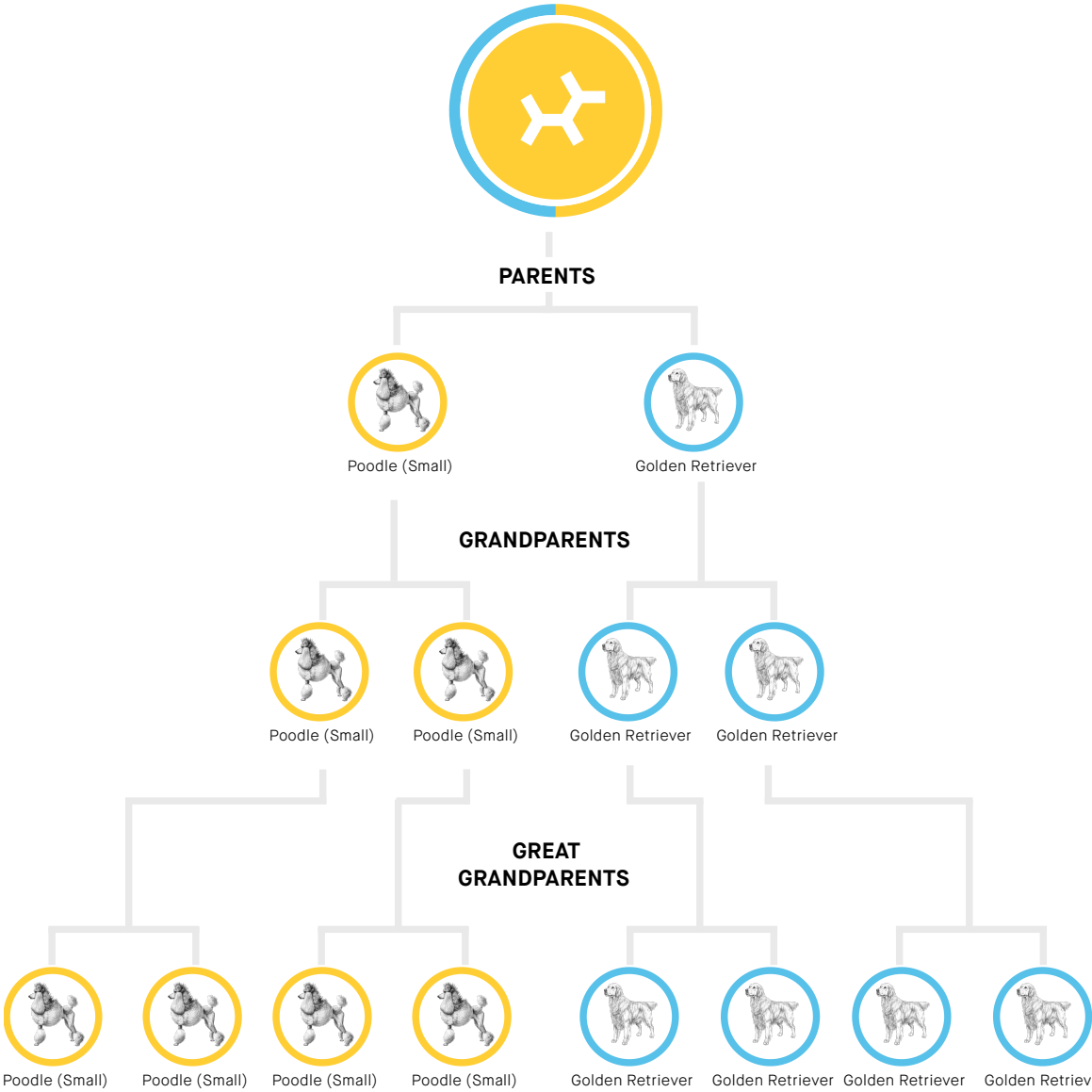
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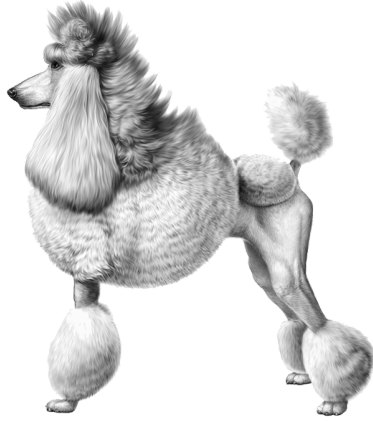
BREED MIX BY CHROMOSOME

Our advanced test identifies from where Alice inherited every part of the chromosome pairs in her genome.



FAMILY TREE





POODLE (SMALL)

Miniature and toy poodles are varieties of the poodle breed which originated in Germany in the 15th century. Unlike the larger standard poodle (>15 inches tall), these small poodles were not developed for hunting---except for truffles!---and were generally used as lap dogs and companions. Small poodles are frequently used to create designer dogs like Schnoodles and Maltipoos with low-shedding, hypoallergenic coats. All poodles are highly intelligent and energetic, and need daily exercise and stimulation. They are overall healthy dogs, although heritable eye disease, epilepsy and allergies are relatively common, and toy poodles also have a heightened risk of accidents/trauma due to their small size.

Alternative Names

Toy Poodle, Miniature Poodle

Fun Fact

Although Toy Poodles are the most popular dog breed in Japan, Poodles as a group are the eight most popular breed in the US, with miniature poodles being the most common variety.

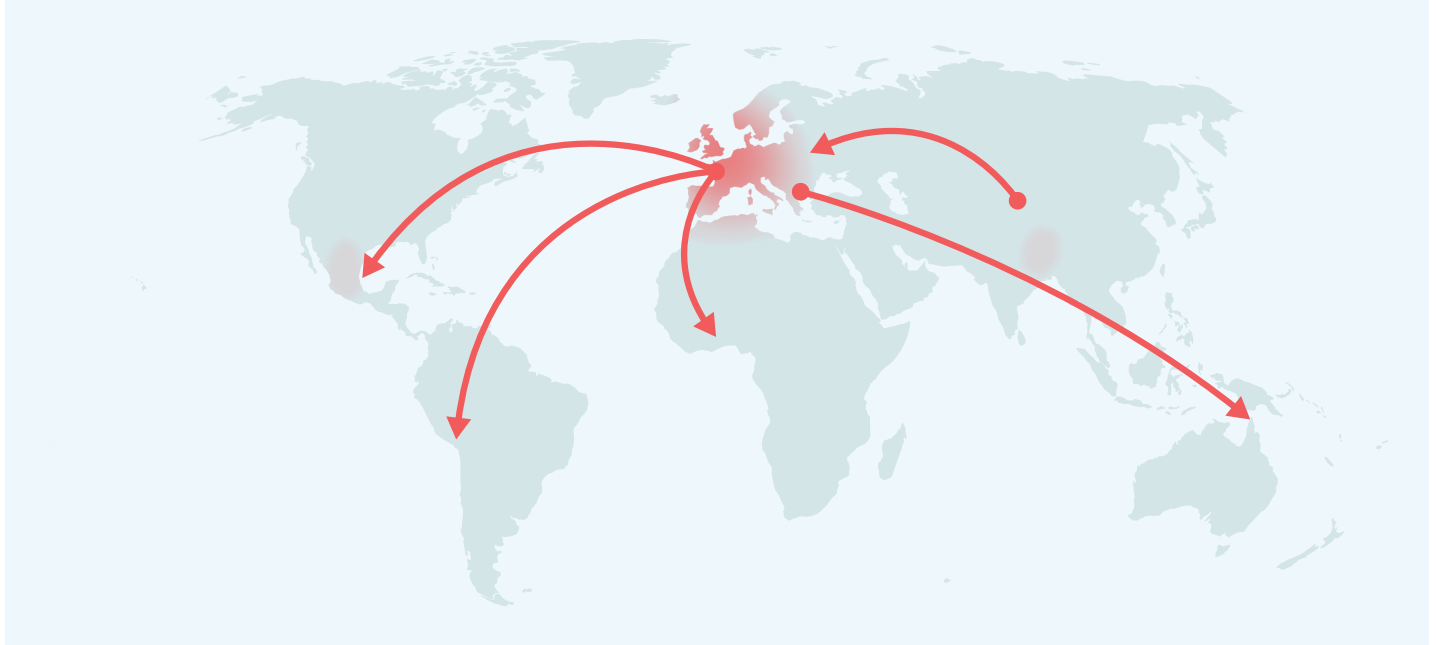
**Fun Fact**

A Golden Retriever is also pictured in the Guinness Book of World's Records for "Most tennis balls held in mouth" (with 6).

GOLDEN RETRIEVER

The Golden Retriever was developed in the early 19th century as an ideal hunting companion, able to retrieve birds on both land and water in the marshy Scottish countryside. Their friendliness and intelligence makes the both a popular family pet and an excellent working dog, well suited for being a service dog, therapy dog or for search and rescue. The third most popular breed in the US, the American and Canadian Goldens are generally lankier and darker than their British counterparts. Their wavy, feathered topcoat is water resistant, their undercoat helps them with thermoregulation and both coats have a tendency for heavy seasonal shedding. Goldens need lots of exercise (especially when younger), and their love of play and water means their owners usually get a lot of exercise too! In 2013, the 100th anniversary of Britain's Golden Retriever Club, Goldens from around the world came made the pilgrimage to the breed's birthplace in Scotland, where 222 of them posed in a single record-breaking photo. At the same time, the Golden Retriever Lifetime Study was getting started in the United States, recruiting 3,000 Golden Retrievers for a lifetime study aimed at understanding how genetics, lifestyle and environment influences healthy aging and cancer risk in Goldens.

MATERNAL LINE



Through Alice's mitochondrial DNA we can trace her mother's ancestry back to where dogs and people first became friends. This map helps you visualize the routes that her ancestors took to your home. Their story is described below the map.

HAPLOGROUP: B1

B1 is the second most common maternal lineage in breeds of European or American origin. It is the female line of the majority of Golden Retrievers, Basset Hounds, and Shih Tzus, and about half of Beagles, Pekingese and Toy Poodles. This lineage is also somewhat common among village dogs that carry distinct ancestry from these breeds. We know this is a result of B1 dogs being common amongst the European dogs that their conquering owners brought around the world, because nowhere on earth is it a very common lineage in village dogs. It even enables us to trace the path of (human) colonization: Because most Bichons are B1 and Bichons are popular in Spanish culture, B1 is now fairly common among village dogs in Latin America.

HAPLOTYPE: B84

Part of the large B1 haplogroup, this haplotype occurs most frequently in Golden Retrievers, Beagles, and Staffordshire Terriers.

TRAITS: BASE COAT COLOR

TRAIT	RESULT
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Dark or Light Fur | *E (Extension) Locus* | Gene: *Melanocortin Receptor 1 (MC1R)* | Genetic Result: **ee**

This gene helps determine whether a dog can produce dark (black or brown) hairs or lighter yellow or red hairs. Any result except for **ee** means that the dog can produce dark hairs. An **ee** result means that the dog does not produce dark hairs and will have lighter yellow or red hairs all over its entire body.

The overall MC1R genetic result is influenced by more subloci than those presented in this section. Additional MC1R subloci results can be found under the **Coat Color Modifiers > Facial Fur Pattern** section below.

Light colored fur
(cream to red)

Did You Know? If a dog has an **ee** result, then the fur's actual shade can range from a deep copper to white - the exact color cannot be predicted solely from this result and will depend on other genetic factors, including the red pigment intensity test.

Dark brown pigment | *Cocoa* | Gene: *HPS3* | Genetic Result: **NN**

Dogs with the **coco** genotype will produce dark brown pigment instead of black in both their hair and skin. Dogs with the **Nco** genotype will produce black pigment, but can pass the **co** variant on to their puppies. Dogs that have the **coco** genotype as well as the **bb** genotype at the B locus are generally a lighter brown than dogs that have the **Bb** or **BB** genotypes at the B locus.

No impact on skin
color

Did You Know? The **co** variant and the dark brown "cocoa" coat color have only been documented in French Bulldogs. Dogs with the cocoa coat color are sometimes born with light brown coats that darken as they reach maturity.

Red Pigment Intensity | *I (Intensity) Loci* | Genetic Result: **Intermediate Red Pigmentation**

Intensity refers to the concentration of red pigment in the coat. Dogs with more densely concentrated (intense) pigment will be a deeper red, while dogs with less concentrated (dilute) pigment will be tan, yellow, cream, or white. Five locations in the dog genome explain approximately 70% of red pigmentation intensity variation across all dogs. Because the locations we test may not directly cause differences in red pigmentation intensity, we consider this to be a linkage test.

Any pigmented fur
likely yellow or tan

Did You Know? One of the genes that influences pigment intensity in dogs, TYR, is also responsible for intensity variation in domestic mice, cats, cattle, rabbits, and llamas. In dogs and humans, more genes are involved.

TRAITS: BASE COAT COLOR (CONTINUED)

TRAIT

RESULT

Brown or Black Pigment | *B (Brown) Locus* | *Gene: Tyrosinase Related Protein 1 (TYRP1)* | Genetic Result: **BB**

This gene helps determine whether a dog produces brown or black pigments. Dogs with a **bb** result produce brown pigment instead of black in both their hair and skin, while dogs with a **Bb** or **BB** result produce black pigment. Dogs that have **ee** at the E (Extension) Locus and **bb** at this B (Brown) Locus are likely to have red or cream coats and brown noses, eye rims, and footpads, which is sometimes referred to as "Dudley Nose" in Labrador Retrievers.

Likely black colored
nose/feet

Did You Know? "Liver" or "chocolate" is the preferred color term for brown in most breeds; in the Doberman Pinscher it is referred to as "red".

Color Dilution | *D (Dilute) Locus* | *Gene: Melanophilin (MLPH)* | Genetic Result: **DD**

This gene helps determine whether a dog has lighter "diluted" pigment. A dog with a **Dd** or **DD** result will not be dilute. A dog with a **dd** result will have all their black or brown pigment lightened ("diluted") to gray or light brown, and may lighten red pigment to cream. This affects their fur, skin, and sometimes eye color. The D locus result that we report is determined by three different genetic variants that can work together to cause diluted pigmentation. These are the common **d** allele, also known as "**d1**", and the less common alleles known as "**d2**" and "**d3**". Dogs with two **d** alleles, regardless of which variant, are typically dilute.

Dark (non-dilute) skin

Did You Know? There are many breed-specific names for these dilute colors, such as "blue", "charcoal", "fawn", "silver", and "Isabella". Dilute dogs, especially in certain breeds, have a higher incidence of Color Dilution Alopecia which causes hair loss in some patches.

TRAITS: COAT COLOR MODIFIERS

TRAIT	RESULT
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Hidden Patterning | *K (Dominant Black) Locus* | Gene: Canine Beta-Defensin 103 (CBD103) | Genetic Result: K^BK^B

This gene helps determine whether the dog has a black coat. Dogs with a k^Yk^Y result will show a coat color pattern based on the result they have at the A (Agouti) Locus. A K^BK^B or K^Bk^Y result means the dog is dominant black, which overrides the fur pattern that would otherwise be determined by the A (Agouti) Locus. These dogs will usually have solid black or brown coats, or if they have ee at the E (Extension) Locus then red/cream coats, regardless of their result at the A (Agouti) Locus. Dogs who test as K^Bk^Y may be brindle rather than black or brown.

No impact on coat color

Did You Know? Even if a dog is "dominant black" several other genes could still impact the dog's fur and cause other patterns, such as white spotting.

Body Pattern | *A (Agouti) Locus* | Gene: Agouti Signalling Protein (ASIP) | Genetic Result: a^+a

This gene is responsible for causing different coat patterns. It only affects the fur of dogs that do not have ee at the E (Extension) Locus and do have k^Yk^Y at the K (Dominant Black) Locus. It controls switching between black and red pigment in hair cells, which means that it can cause a dog to have hairs that have sections of black and sections of red/cream, or hairs with different colors on different parts of the dog's body. Sable or Fawn dogs have a mostly or entirely red coat with some interspersed black hairs. Agouti or Wolf Sable dogs have red hairs with black tips, mostly on their head and back. Black and tan dogs are mostly black or brown with lighter patches on their cheeks, eyebrows, chest, and legs. Recessive black dogs have solid-colored black or brown coats.

No impact on coat pattern

Did You Know? The ASIP gene causes interesting coat patterns in many other species of animals as well as dogs.

TRAITS: COAT COLOR MODIFIERS (CONTINUED)

TRAIT	RESULT
Facial Fur Pattern <i>E (Extension) Locus</i> <i>Gene: Melanocortin Receptor 1 (MC1R)</i> Genetic Result: ee	
This gene determines whether a dog can have dark hair and can give it a black “mask” or “widow’s peak,” unless the dog has overriding coat color genetic factors. Dogs with one or two copies of E^m in their result may have a mask, which is dark facial fur as seen in the German Shepherd Dog and Pug. Dogs with no E^m in their result but one or two copies of the E^g, E^a, or E^h variants can instead have a “widow’s peak”, which is dark forehead fur.	
Did You Know?	No dark fur anywhere
The “widow’s peak” is seen in the Afghan Hound and Borzoi, and is called either “grizzle” or “domino.”	
In the absence of E^m, dogs with the E^g variant can have a “widow’s peak” phenotype. In the absence of both E^m and E variants, dogs with the E^a or E^h variants can express the “widow’s peak” phenotype. Additionally, a dog with any combination of two of the E^g, E^a, or E^h variants (example: E^gE^a) is also expected to express the grizzle phenotype.	
Saddle Tan <i>Gene: RALY</i> Genetic Result: NI	
The “Saddle Tan” pattern causes the black hairs to recede into a “saddle” shape on the back, leaving a tan face, legs, and belly, as a dog ages. The Saddle Tan pattern is characteristic of breeds like the Corgi, Beagle, and German Shepherd. Dogs that have the II genotype at this locus are more likely to be mostly black with tan points on the eyebrows, muzzle, and legs as commonly seen in the Doberman Pinscher and the Rottweiler. This gene modifies the A Locus a^t allele, so dogs that do not express a^t are not influenced by this gene.	No impact on coat pattern
Did You Know? The Saddle Tan pattern is characteristic of breeds like the Corgi, Beagle, and German Shepherd.	

TRAITS: COAT COLOR MODIFIERS (CONTINUED)

TRAIT	RESULT
White Spotting <i>S (White Spotting) Locus</i> <i>Gene: MITF</i> Genetic Result: SS This gene is responsible for most of the white spotting observed in dogs. Dogs with a result of spsp will have a nearly white coat or large patches of white in their coat. Dogs with a result of Ssp will have more limited white spotting that is breed-dependent. A result of SS means that a dog likely has no white or minimal white in their coat. The S Locus does not explain all white spotting patterns in dogs and other causes are currently being researched. Some dogs may have small amounts of white on the paws, chest, face, or tail regardless of their result at this gene. Did You Know? Any dog can have white spotting regardless of coat color. The colored sections of the coat will reflect the dog's other genetic coat color results.	Likely to have little to no white in coat
Roan <i>R (Roan) Locus</i> <i>Gene: USH2A</i> Genetic Result: rr This gene, along with the S Locus, regulates whether a dog will have roaning. Dogs with at least one copy of R will likely have roaning on otherwise uniformly unpigmented white areas created by the S Locus. Roan may not be visible if white spotting is limited to small areas, such as the paws, chest, face, or tail. The extent of roaning varies from uniform roaning to non-uniform roaning, and patchy, non-uniform roaning may look similar to ticking. Roan does not appear in white areas created by other genes, such as a combination of the E Locus and I Locus (for example, Samoyeds). The roan pattern can appear with or without ticking. Did You Know? Roan, tick, and Dalmatians' spots become visible a few weeks after birth. The R Locus is probably involved in the development of Dalmatians' spots.	Likely no impact on coat pattern
Merle <i>M (Merle) Locus</i> <i>Gene: PMEL</i> Genetic Result: mm This gene is responsible for mottled or patchy coat color in some dogs. Dogs with an M*m result are likely to appear merle or could be "non-expressing" merle, meaning that the merle pattern is very subtle or not at all evident in their coat. Dogs with an M*M* result are likely to have merle or double merle coat patterning. Dogs with an mm result are unlikely to have a merle coat pattern. Did You Know? Merle coat patterning is common to several dog breeds including the Australian Shepherd, Catahoula Leopard Dog, and Shetland Sheepdog.	No impact on coat color

TRAITS: COAT COLOR MODIFIERS (CONTINUED)

TRAIT	RESULT
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Harlequin | *Gene: PSMB* | Genetic Result: **hh**

This gene, along with the M Locus, determines whether a dog will have harlequin patterning. This pattern is recognized in Great Danes and causes dogs to have a white coat with patches of darker pigment. A dog with an **Hh** result will be harlequin if they are also **M*m** or **M*M*** at the M Locus and are not **ee** at the E locus. Dogs with a result of **hh** will not be harlequin.

No impact on coat pattern

Did You Know? While many harlequin dogs are white with black patches, some dogs have grey, sable, or brindle patches of color, depending on their genotypes at other coat color genes.

Panda White Spotting | *Gene: KIT* | Genetic Result: **NN**

Panda White Spotting originated in a line of German Shepherd Dogs and causes a mostly symmetrical white spotting of the head and/or body. This is a dominant variant of the KIT gene, which has a role in pigmentation.

Dogs with one copy of the I allele will exhibit this white spotting. Dogs with two copies of the I allele have never been observed, as two copies of the variant is suspected to be lethal to the developing embryo. Dogs with the **NN** result will not exhibit white spotting due to this variant.

Not expected to display Panda pattern

Did You Know? A de novo mutation (a genetic mutation not inherited from the parents) occurred in a female German Shepherd Dog named Lewcinka's Franka von Phenom. She was born in 2000, and all Panda Shepherds can trace their bloodline back to her.

TRAITS: OTHER COAT TRAITS

TRAIT	RESULT
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Furnishings | Gene: *RSPO2* | Genetic Result: **FI**

This gene is responsible for “furnishings”, which is another name for the mustache, beard, and eyebrows that are characteristic of breeds like the Schnauzer, Scottish Terrier, and Wire Haired Dachshund. A dog with an **FF** or **FI** result is likely to have furnishings. A dog with an **II** result will not have furnishings. We measure this result using a linkage test.

Likely furnished
(mustache, beard,
and/or eyebrows)

Did You Know? In breeds that are expected to have furnishings, dogs without furnishings are the exception - this is sometimes called an “improper coat”.

Coat Length | Gene: *FGF5* | Genetic Result: **LhLh**

This gene affects hair length in many species, including cats, dogs, mice, and humans. In dogs, an **Lh** allele confers a long, silky hair coat across many breeds, including Yorkshire Terriers, Cocker Spaniels, and Golden Retrievers. An **ShSh** or **ShLh** result is likely to mean a shorter coat, like in the Boxer or the American Staffordshire Terrier. The coat length determined by *FGF5*, as reported by us, is influenced by four genetic variants that work together to promote long hair.

The most common of these is the **Lh1** variant (G/T, CanFam3.1, chr32, g.4509367) and the less common ones are **Lh2** (C/T, CanFam3.1, chr32, g.4528639), **Lh3** (16bp deletion, CanFam3.1, chr32, g.4528616), and **Lh4** (GG insertion, CanFam3.1, chr32, g.4528621). The *FGF5_Lh1* variant is found across many dog breeds. The less common variants, *FGF5_Lh2* have been found in the Akita, Samoyed, and Siberian Husky, *FGF5_Lh3* have been found in the Eurasier, and *FGF5_Lh4* have been found in the Afghan Hound, Eurasier, and French Bulldog.

Likely long coat

The **Lh** alleles have a recessive mode of inheritance, meaning that two copies of the **Lh** alleles are required to have long hair. The presence of two **Lh** alleles at any of these *FGF5* loci is expected to result in long hair. One copy each of **Lh1** and **Lh2** have been found in Samoyeds, one copy each of **Lh1** and **Lh3** have been found in Eurasiers and one copy each of **Lh1** and **Lh4** have been found in Afghan Hounds and Eurasiers.

Did You Know? In certain breeds, such as Pembroke Welsh Corgi and French Bulldog, the long coat is described as “fluffy.”

TRAITS: OTHER COAT TRAITS (CONTINUED)

TRAIT	RESULT
Shedding <i>Gene: MC5R</i> Genetic Result: CT	
This gene affects how much a dog sheds. Dogs with furnishings or wire-haired coats tend to be low shedders regardless of their result for this gene. In other dogs, a CC or CT result indicates heavy or seasonal shedding, like many Labradors and German Shepherd Dogs. Dogs with a TT result tend to be lighter shedders, like Boxers, Shih Tzus and Chihuahuas.	Likely light shedding
Coat Texture <i>Gene: KRT71</i> Genetic Result: CT	
For dogs with long fur, dogs with a TT or CT result will likely have a wavy or curly coat like the coat of Poodles and Bichon Frises. Dogs with a CC result will likely have a straight coat—unless the dog has a "Likely Furnished" result for the Furnishings trait, since this can also make the coat more curly.	Likely wavy coat
Did You Know? Dogs with short coats may have straight coats, whatever result they have for this gene.	
Hairlessness (Xolo type) <i>Gene: FOXI3</i> Genetic Result: NN	
This gene can cause hairlessness over most of the body as well as changes in tooth shape and number. This particular gene occurs in Peruvian Inca Orchid, Xoloitzcuintli (Mexican Hairless), and Chinese Crested; other hairless breeds are due to different genes. Dogs with the NDup result are likely to be hairless while dogs with the NN result are likely to have a normal coat. We measure this result using a linkage test.	Very unlikely to be hairless
Did You Know? The DupDup result has never been observed, suggesting that dogs with that genotype cannot survive to birth.	
Hairlessness (Terrier type) <i>Gene: SGK3</i> Genetic Result: NN	
This gene is responsible for Hairlessness in the American Hairless Terrier. Dogs with the DD result are likely to be hairless. Dogs with the ND genotype will have a normal coat, but can pass the D variant on to their offspring.	Very unlikely to be hairless
Oculocutaneous Albinism Type 2 <i>Gene: SLC45A2</i> Genetic Result: NN	
This gene causes oculocutaneous albinism (OCA), also known as Doberman Z Factor Albinism. Dogs with a DD result will have OCA. Effects include severely reduced or absent pigment in the eyes, skin, and hair and	

TRAITS: OTHER BODY FEATURES

TRAIT	RESULT
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Muzzle Length | Gene: *BMP3* | Genetic Result: **AC**

This gene affects muzzle length. A dog with a **AC** or **CC** result is likely to have a medium-length muzzle like a Staffordshire Terrier or Labrador, or a long muzzle like a Whippet or Collie. A dog with a **AA** result is likely to have a short muzzle, like an English Bulldog, Pug, or Pekingese.

Likely medium or long muzzle

Did You Know? At least five different genes affect snout length in dogs, with *BMP3* being the only one with a known causal mutation. For example, the muzzle length of some breeds, including the long-snouted Scottish Terrier or the short-snouted Japanese Chin, appear to be caused by other genes. This means your dog may have a long or short snout due to other genetic factors. Embark is working to figure out what these might be.

Tail Length | Gene: *T* | Genetic Result: **CC**

This is one of the genes that can cause a short bobtail. Most dogs have a **CC** result and a long tail. Dogs with a **CG** result are likely to have a bobtail, which is an unusually short or absent tail. This can be seen in many "natural bobtail" breeds including the Pembroke Welsh Corgi, the Australian Shepherd, and the Brittany Spaniel. Dogs with **GG** genotypes have not been observed, suggesting that dogs with such a result do not survive to birth.

Likely normal-length tail

Did You Know? While certain lineages of Boston Terrier, English Bulldog, Rottweiler, Miniature Schnauzer, Cavalier King Charles Spaniel, and Parson Russell Terrier, and Dobermans are born with a natural bobtail, it is not always caused by this gene. This suggests that other unknown genetic effects can also lead to a natural bobtail.

Hind Dew Claws | Gene: *LMBR1* | Genetic Result: **CC**

This is one of the genes that can cause hind dew claws, which are extra, nonfunctional digits located midway between a dog's paw and hock. Dogs with a **CT** or **TT** result have about a 50% chance of having hind dewclaws. Hind dew claws can also be caused by other, still unknown, genes. Embark is working to figure those out.

Unlikely to have hind dew claws

Did You Know? Hind dew claws are commonly found in certain breeds such as the Saint Bernard.

TRAITS: OTHER BODY FEATURES (CONTINUED)

TRAIT	RESULT
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Back Muscling & Bulk (Large Breed) | Gene: *ACSL4* | Genetic Result: **CC**

This gene can cause heavy muscling along the back and trunk in characteristically "bulky" large-breed dogs including the Saint Bernard, Bernese Mountain Dog, Greater Swiss Mountain Dog, and Rottweiler. A dog with the **TT** result is likely to have heavy muscling. Leaner-shaped large breed dogs like the Great Dane, Irish Wolfhound, and Scottish Deerhound generally have a **CC** result. The **TC** result also indicates likely normal muscling.

Likely normal muscling

Did You Know? This gene does not seem to affect muscling in small or even mid-sized dog breeds with lots of back muscling, including the American Staffordshire Terrier, Boston Terrier, and the English Bulldog.

Eye Color | Gene: *ALX4* | Genetic Result: **NN**

This gene is associated with blue eyes in Arctic breeds like Siberian Husky as well as tri-colored (non-merle) Australian Shepherds. Dogs with a **DupDup** or **NDup** result are more likely to have blue eyes, although some dogs may have only one blue eye or may not have blue eyes at all; nevertheless, they can still pass blue eyes to their offspring. Dogs with a **NN** result may have blue eyes due to other factors, such as merle or white spotting. We measure this result using a linkage test.

Less likely to have blue eyes

Did You Know? Embark researchers discovered this gene by studying data from dogs like yours. Who knows what we will be able to discover next? Answer the questions on our research surveys to contribute to future discoveries!

Chondrodysplasia (Leg Length) | Gene: *Chr. 18 FGF4 Retrogene* | Genetic Result: **NN**

This variant is associated with a type of disproportionate dwarfism known as chondrodysplasia (CDPA). CDPA is a breed-defining characteristic of many breeds exhibiting a "short-legged, long-bodied" appearance, such as Corgis, Dachshunds, Basset Hounds, and others. Dogs with the **II** result display the largest reduction in leg length. Dogs with the **NI** genotype will have an intermediate leg length, while dogs with the **NN** result will not exhibit leg shortening due to this variant.

Likely to have normal leg length

Did You Know? A similar genetic variant called the chondrodystrophy (CDDY) variant also plays an important role in shortening the leg length of many breeds. Dog breeds with the shortest legs, like the Corgi, Dachshund, and Basset Hound generally have one or two copies of the CDDY and CDPA variants. CDDY (but not CDPA) is also associated with an increased risk of Type I Intervertebral Disc Disease (IVDD). You can see the CDDY result in the health test results under "Intervertebral Disc Disease Type I".

TRAITS: BODY SIZE

TRAIT	RESULT
Body Size 1 <i>Gene: IGF1</i> Genetic Result: NI This is one of several genes that influence the size of a dog. A result of II for this gene is associated with smaller body size. A result of NN is associated with larger body size.	Intermediate
Body Size 2 <i>Gene: IGF1</i> Genetic Result: GA This is one of several genes that influence the size of a dog. A result of AA for this gene is associated with smaller body size. A result of GG is associated with larger body size.	Intermediate
Body Size 3 <i>Gene: STC2</i> Genetic Result: TA This is one of several genes that influence the size of a dog. A result of AA for this gene is associated with smaller body size. A result of TT is associated with larger body size.	Intermediate
Body Size 4 <i>Gene: GHR - E191K</i> Genetic Result: AA This is one of several genes that influence the size of a dog. A result of AA for this gene is associated with smaller body size. A result of GG is associated with larger body size.	Smaller
Body Size 5 <i>Gene: GHR - P177L</i> Genetic Result: CC This is one of several genes that influence the size of a dog. A result of TT for this gene is associated with smaller body size. A result of CC is associated with larger body size.	Larger

TRAITS: PERFORMANCE

TRAIT	RESULT
Altitude Adaptation <i>Gene: EPAS1</i> Genetic Result: GG This gene causes dogs to be especially tolerant of low oxygen environments, such as those found at high elevations. Dogs with a AA or GA result will be less susceptible to "altitude sickness." Did You Know? This gene was originally identified in breeds from high altitude areas such as the Tibetan Mastiff.	Normal altitude tolerance
Appetite <i>Gene: POMC</i> Genetic Result: NN This gene influences eating behavior. An ND or DD result would predict higher food motivation compared to NN result, increasing the likelihood to eat excessively, have higher body fat percentage, and be more prone to obesity. Read more about the genetics of POMC, and learn how you can contribute to research, in our blog post (https://embarkvet.com/resources/blog/pomc-dogs/). We measure this result using a linkage test. Did You Know? POMC is actually short for "proopiomelanocortin," and is a large protein that is broken up into several smaller proteins that have biological activity. The smaller proteins generated from POMC control, among other things, distribution of pigment to the hair and skin cells, appetite, and energy expenditure.	Normal food motivation

HEALTH REPORT

How to interpret Alice's genetic health results:

If Alice inherited any of the variants that we tested, they will be listed at the top of the Health Report section, along with a description of how to interpret this result. We also include all of the variants that we tested Alice for that we did not detect the risk variant for.

A genetic test is not a diagnosis

This genetic test does not diagnose a disease. Please talk to your vet about your dog's genetic results, or if you think that your pet may have a health condition or disease.

Summary

Of the 274 genetic health risks we analyzed, we found 3 results that you should learn about.

Increased risk results (1)

Intervertebral Disc Disease (Type I)

Notable results (2)

ALT Activity

Copper Toxicosis (Attenuating)

Clear results

Breed-relevant (16)

Other (254)

BREED-RELEVANT RESULTS

Research studies indicate that these results are more relevant to dogs like Alice, and may influence her chances of developing certain health conditions.

	Intervertebral Disc Disease (Type I) (FGF4 retrogene - CFA12)	Increased risk
	Congenital Myasthenic Syndrome, CMS (COLQ, Golden Retriever Variant)	Clear
	Degenerative Myelopathy, DM (SOD1A)	Clear
	Dystrophic Epidermolysis Bullosa (COL7A1, Golden Retriever Variant)	Clear
	GM2 Gangliosidosis (HEXB, Poodle Variant)	Clear
	Golden Retriever Progressive Retinal Atrophy 1, GR-PRA1 (SLC4A3)	Clear
	Golden Retriever Progressive Retinal Atrophy 2, GR-PRA2 (TTC8)	Clear
	Ichthyosis, ICH1 (PNPLA1, Golden Retriever Variant)	Clear
	Ichthyosis, ICH2 (ABHD5, Golden Retriever Variant)	Clear
	Muscular Dystrophy (DMD, Golden Retriever Variant)	Clear
	Neonatal Encephalopathy with Seizures, NEWS (ATF2)	Clear
	Neuronal Ceroid Lipofuscinosis 5, NCL 5 (CLN5 Exon 4 Deletion, Golden Retriever Variant)	Clear
	Osteochondrodysplasia (SLC13A1, Poodle Variant)	Clear
	Osteogenesis Imperfecta (COL1A1, Golden Retriever Variant)	Clear
	Progressive Retinal Atrophy, prcd (PRCD Exon 1)	Clear
	Retina Dysplasia and/or Optic Nerve Hypoplasia (SIX6 Exon 1, Golden Retriever Variant)	Clear
	Von Willebrand Disease Type I, Type I vWD (VWF)	Clear

OTHER RESULTS

Research has not yet linked these conditions to dogs with similar breeds to Alice. Review any increased risk or notable results to understand her potential risk and recommendations.

 ALT Activity (GPT)	Notable
 Copper Toxicosis (Attenuating) (ATP7A, Labrador Retriever)	Notable
 2-DHA Kidney & Bladder Stones (APRT)	Clear
 Acral Mutilation Syndrome (GDNF-AS, Spaniel and Pointer Variant)	Clear
 Alaskan Husky Encephalopathy (SLC19A3)	Clear
 Alaskan Malamute Polyneuropathy, AMPN (NDRG1 SNP)	Clear
 Alexander Disease (GFAP)	Clear
 Anhidrotic Ectodermal Dysplasia (EDA Intron 8)	Clear
 Autosomal Dominant Progressive Retinal Atrophy (RHO)	Clear
 Bald Thigh Syndrome (IGFBP5)	Clear
 Bernard-Soulier Syndrome, BSS (GP9, Cocker Spaniel Variant)	Clear
 Bully Whippet Syndrome (MSTN)	Clear
 Canine Elliptocytosis (SPTB Exon 30)	Clear
 Canine Fucosidosis (FUCA1)	Clear
 Canine Leukocyte Adhesion Deficiency Type I, CLAD I (ITGB2, Setter Variant)	Clear
 Canine Leukocyte Adhesion Deficiency Type III, CLAD III (FERMT3, German Shepherd Variant)	Clear
 Canine Multifocal Retinopathy, cmr1 (BEST1 Exon 2)	Clear
 Canine Multifocal Retinopathy, cmr2 (BEST1 Exon 5, Coton de Tulear Variant)	Clear

OTHER RESULTS

✓ Canine Multifocal Retinopathy, cmr3 (BEST1 Exon 10 Deletion, Finnish and Swedish Lapphund, Lapponian Herder Variant)	Clear
✓ Canine Multiple System Degeneration (SERAC1 Exon 4, Chinese Crested Variant)	Clear
✓ Canine Multiple System Degeneration (SERAC1 Exon 15, Kerry Blue Terrier Variant)	Clear
✓ Cardiomyopathy and Juvenile Mortality (YARS2)	Clear
✓ Centronuclear Myopathy, CNM (PTPLA)	Clear
✓ Cerebellar Hypoplasia (VLDLR, Eurasier Variant)	Clear
✓ Chondrodysplasia (ITGA10, Norwegian Elkhound and Karelian Bear Dog Variant)	Clear
✓ Cleft Lip and/or Cleft Palate (ADAMTS20, Nova Scotia Duck Tolling Retriever Variant)	Clear
✓ Cleft Palate, CP1 (DLX6 intron 2, Nova Scotia Duck Tolling Retriever Variant)	Clear
✓ Cobalamin Malabsorption (CUBN Exon 8, Beagle Variant)	Clear
✓ Cobalamin Malabsorption (CUBN Exon 53, Border Collie Variant)	Clear
✓ Collie Eye Anomaly (NHEJ1)	Clear
✓ Complement 3 Deficiency, C3 Deficiency (C3)	Clear
✓ Congenital Cornification Disorder (NSDHL, Chihuahua Variant)	Clear
✓ Congenital Dyserythropoietic Anemia and Polymyopathy (EHPB1L1, Labrador Retriever Variant)	Clear
✓ Congenital Hypothyroidism (TPO, Rat, Toy, Hairless Terrier Variant)	Clear
✓ Congenital Hypothyroidism (TPO, Tenterfield Terrier Variant)	Clear
✓ Congenital Hypothyroidism with Goiter (TPO Intron 13, French Bulldog Variant)	Clear

OTHER RESULTS

✔ Congenital Hypothyroidism with Goiter (SLC5A5, Shih Tzu Variant)	Clear
✔ Congenital Macrothrombocytopenia (TUBB1 Exon 1, Cairn and Norfolk Terrier Variant)	Clear
✔ Congenital Muscular Dystrophy (LAMA2, Italian Greyhound)	Clear
✔ Congenital Myasthenic Syndrome, CMS (COLQ, Labrador Retriever Variant)	Clear
✔ Congenital Myasthenic Syndrome, CMS (CHAT, Old Danish Pointing Dog Variant)	Clear
✔ Congenital Myasthenic Syndrome, CMS (CHRNE, Jack Russell Terrier Variant)	Clear
✔ Congenital Stationary Night Blindness (LRIT3, Beagle Variant)	Clear
✔ Congenital Stationary Night Blindness (RPE65, Briard Variant)	Clear
✔ Copper Toxicosis (Accumulating) (ATP7B)	Clear
✔ Copper Toxicosis (Attenuating) (RETN, Labrador Retriever)	Clear
✔ Craniomandibular Osteopathy, CMO (SLC37A2)	Clear
✔ Craniomandibular Osteopathy, CMO (SLC37A2 Intron 16, Basset Hound Variant)	Clear
✔ Cystinuria Type I-A (SLC3A1, Newfoundland Variant)	Clear
✔ Cystinuria Type II-A (SLC3A1, Australian Cattle Dog Variant)	Clear
✔ Cystinuria Type II-B (SLC7A9, Miniature Pinscher Variant)	Clear
✔ Darier Disease (ATP2A2, Irish Terrier Variant)	Clear
✔ Day Blindness (CNGB3 Deletion, Alaskan Malamute Variant)	Clear
✔ Day Blindness (CNGA3 Exon 7, German Shepherd Variant)	Clear

OTHER RESULTS

 Day Blindness (CNGA3 Exon 7, Labrador Retriever Variant)	Clear
 Day Blindness (CNGB3 Exon 6, German Shorthaired Pointer Variant)	Clear
 Deafness and Vestibular Syndrome of Dobermans, DVDob, DINGS (MYO7A)	Clear
 Demyelinating Polyneuropathy (SBF2/MTRM13)	Clear
 Dental-Skeletal-Retinal Anomaly (MIA3, Cane Corso Variant)	Clear
 Diffuse Cystic Renal Dysplasia and Hepatic Fibrosis (INPP5E Intron 9, Norwich Terrier Variant)	Clear
 Dilated Cardiomyopathy, DCM (RBM20, Schnauzer Variant)	Clear
 Dilated Cardiomyopathy, DCM1 (PDK4, Doberman Pinscher Variant 1)	Clear
 Dilated Cardiomyopathy, DCM2 (TTN, Doberman Pinscher Variant 2)	Clear
 Disproportionate Dwarfism (PRKG2, Dogo Argentino Variant)	Clear
 Dry Eye Curly Coat Syndrome (FAM83H Exon 5)	Clear
 Dystrophic Epidermolysis Bullosa (COL7A1, Central Asian Shepherd Dog Variant)	Clear
 Early Bilateral Deafness (LOXHD1 Exon 38, Rottweiler Variant)	Clear
 Early Onset Adult Deafness, EOAD (EPS8L2 Deletion, Rhodesian Ridgeback Variant)	Clear
 Early Onset Cerebellar Ataxia (SEL1L, Finnish Hound Variant)	Clear
 Ehlers Danlos (ADAMTS2, Doberman Pinscher Variant)	Clear
 Ehlers-Danlos Syndrome (EDS) (COL5A1, Labrador Retriever Variant)	Clear
 Enamel Hypoplasia (ENAM Deletion, Italian Greyhound Variant)	Clear

OTHER RESULTS

✓ Enamel Hypoplasia (ENAM SNP, Parson Russell Terrier Variant)	Clear
✓ Episodic Falling Syndrome (BCAN)	Clear
✓ Exercise-Induced Collapse, EIC (DNM1)	Clear
✓ Factor VII Deficiency (F7 Exon 5)	Clear
✓ Factor XI Deficiency (F11 Exon 7, Kerry Blue Terrier Variant)	Clear
✓ Familial Nephropathy (COL4A4 Exon 3, Cocker Spaniel Variant)	Clear
✓ Familial Nephropathy (COL4A4 Exon 30, English Springer Spaniel Variant)	Clear
✓ Fanconi Syndrome (FAN1, Basenji Variant)	Clear
✓ Fetal-Onset Neonatal Neuroaxonal Dystrophy (MFN2, Giant Schnauzer Variant)	Clear
✓ Glanzmann's Thrombasthenia Type I (ITGA2B Exon 13, Great Pyrenees Variant)	Clear
✓ Glanzmann's Thrombasthenia Type I (ITGA2B Exon 12, Otterhound Variant)	Clear
✓ Globoid Cell Leukodystrophy, Krabbe disease (GALC Exon 5, Terrier Variant)	Clear
✓ Glycogen Storage Disease Type IA, Von Gierke Disease, GSD IA (G6PC1, German Pinscher Variant)	Clear
✓ Glycogen Storage Disease Type IA, Von Gierke Disease, GSD IA (G6PC, Maltese Variant)	Clear
✓ Glycogen Storage Disease Type IIIA, GSD IIIA (AGL, Curly Coated Retriever Variant)	Clear
✓ Glycogen storage disease Type VII, Phosphofructokinase Deficiency, PFK Deficiency (PFKM, Whippet and English Springer Spaniel Variant)	Clear
✓ Glycogen storage disease Type VII, Phosphofructokinase Deficiency, PFK Deficiency (PFKM, Wachtelhund Variant)	Clear
✓ GM1 Gangliosidosis (GLB1 Exon 2, Portuguese Water Dog Variant)	Clear

OTHER RESULTS

	GM1 Gangliosidosis (GLB1 Exon 15, Shiba Inu Variant)	Clear
	GM1 Gangliosidosis (GLB1 Exon 15, Alaskan Husky Variant)	Clear
	GM2 Gangliosidosis (HEXA, Japanese Chin Variant)	Clear
	Goniodysgenesis and Glaucoma, Pectinate Ligament Dysplasia, PLD (OLFM3)	Clear
	Hemophilia A (F8 Exon 11, German Shepherd Variant 1)	Clear
	Hemophilia A (F8 Exon 1, German Shepherd Variant 2)	Clear
	Hemophilia A (F8 Exon 10, Boxer Variant)	Clear
	Hemophilia B (F9 Exon 7, Terrier Variant)	Clear
	Hemophilia B (F9 Exon 7, Rhodesian Ridgeback Variant)	Clear
	Hereditary Ataxia (PNPLA8, Australian Shepherd Variant)	Clear
	Hereditary Ataxia, Cerebellar Degeneration (RAB24, Old English Sheepdog and Gordon Setter Variant)	Clear
	Hereditary Cataracts (HSF4 Exon 9, Australian Shepherd Variant)	Clear
	Hereditary Cataracts (FYCO1, Wirehaired Pointing Griffon Variant)	Clear
	Hereditary Cerebellar Ataxia (SELENOP, Belgian Shepherd Variant)	Clear
	Hereditary Footpad Hyperkeratosis (FAM83G, Terrier and Kromfohrlander Variant)	Clear
	Hereditary Footpad Hyperkeratosis (DSG1, Rottweiler Variant)	Clear
	Hereditary Nasal Parakeratosis (SUV39H2 Intron 4, Greyhound Variant)	Clear
	Hereditary Nasal Parakeratosis, HNPk (SUV39H2)	Clear

OTHER RESULTS

 Hereditary Vitamin D-Resistant Rickets (VDR)	Clear
 Hypocatalasia, Acatlasemia (CAT)	Clear
 Hypomyelination and Tremors (FNIP2, Weimaraner Variant)	Clear
 Hypophosphatasia (ALPL Exon 9, Karelian Bear Dog Variant)	Clear
 Ichthyosis (NIPAL4, American Bulldog Variant)	Clear
 Ichthyosis (ASPRV1 Exon 2, German Shepherd Variant)	Clear
 Ichthyosis (SLC27A4, Great Dane Variant)	Clear
 Ichthyosis, Epidermolytic Hyperkeratosis (KRT10, Terrier Variant)	Clear
 Inflammatory Myopathy (SLC25A12)	Clear
 Inherited Myopathy of Great Danes (BIN1)	Clear
 Inherited Selected Cobalamin Malabsorption with Proteinuria (CUBN, Komondor Variant)	Clear
 Intestinal Lipid Malabsorption (ACSL5, Australian Kelpie)	Clear
 Junctional Epidermolysis Bullosa (LAMA3 Exon 66, Australian Cattle Dog Variant)	Clear
 Junctional Epidermolysis Bullosa (LAMB3 Exon 11, Australian Shepherd Variant)	Clear
 Juvenile Epilepsy (LGI2)	Clear
 Juvenile Laryngeal Paralysis and Polyneuropathy (RAB3GAP1, Rottweiler Variant)	Clear
 Juvenile Myoclonic Epilepsy (DIRAS1)	Clear
 L-2-Hydroxyglutaricaciduria, L2HGA (L2HGDH, Staffordshire Bull Terrier Variant)	Clear

OTHER RESULTS

 Lagotto Storage Disease (ATG4D)	Clear
 Laryngeal Paralysis (RAPGEF6, Miniature Bull Terrier Variant)	Clear
 Laryngeal Paralysis and Polyneuropathy (CNTNAP1, Leonberger, Saint Bernard, and Labrador Retriever variant)	Clear
 Late Onset Spinocerebellar Ataxia (CAPN1)	Clear
 Late-Onset Neuronal Ceroid Lipofuscinosis, NCL 12 (ATP13A2, Australian Cattle Dog Variant)	Clear
 Leonberger Polyneuropathy 1 (LPN1, ARHGEF10)	Clear
 Leonberger Polyneuropathy 2 (GJA9)	Clear
 Lethal Acrodermatitis, LAD (MKLN1)	Clear
 Leukodystrophy (TSEN54 Exon 5, Standard Schnauzer Variant)	Clear
 Ligneous Membranitis, LM (PLG)	Clear
 Limb Girdle Muscular Dystrophy (SGCD, Boston Terrier Variant)	Clear
 Limb-Girdle Muscular Dystrophy 2D (SGCA Exon 3, Miniature Dachshund Variant)	Clear
 Long QT Syndrome (KCNQ1)	Clear
 Lundehund Syndrome (LEPREL1)	Clear
 Macular Corneal Dystrophy, MCD (CHST6)	Clear
 Malignant Hyperthermia (RYR1)	Clear
 May-Hegglin Anomaly (MYH9)	Clear
 MDR1 Drug Sensitivity (ABCB1)	Clear

OTHER RESULTS

✓ Medium-Chain Acyl-CoA Dehydrogenase Deficiency, MCADD (ACADM, Cavalier King Charles Spaniel Variant)	Clear
✓ Methemoglobinemia (CYB5R3, Pit Bull Terrier Variant)	Clear
✓ Methemoglobinemia (CYB5R3)	Clear
✓ Microphthalmia (RBP4 Exon 2, Soft Coated Wheaten Terrier Variant)	Clear
✓ Mucopolysaccharidosis IIIB, Sanfilippo Syndrome Type B, MPS IIIB (NAGLU, Schipperke Variant)	Clear
✓ Mucopolysaccharidosis Type IIIA, Sanfilippo Syndrome Type A, MPS IIIA (SGSH Exon 6, Dachshund Variant)	Clear
✓ Mucopolysaccharidosis Type IIIA, Sanfilippo Syndrome Type A, MPS IIIA (SGSH Exon 6, New Zealand Huntaway Variant)	Clear
✓ Mucopolysaccharidosis Type VI, Maroteaux-Lamy Syndrome, MPS VI (ARSB Exon 5, Miniature Pinscher Variant)	Clear
✓ Mucopolysaccharidosis Type VII, Sly Syndrome, MPS VII (GUSB Exon 3, German Shepherd Variant)	Clear
✓ Mucopolysaccharidosis Type VII, Sly Syndrome, MPS VII (GUSB Exon 5, Terrier Brasileiro Variant)	Clear
✓ Muscular Dystrophy (DMD, Cavalier King Charles Spaniel Variant 1)	Clear
✓ Muscular Dystrophy-Dystroglycanopathy (LARGE1, Labrador Retriever Variant)	Clear
✓ Musladin-Lueke Syndrome, MLS (ADAMTSL2)	Clear
✓ Myasthenia Gravis-Like Syndrome (CHRNE, Heideterrier Variant)	Clear
✓ Myotonia Congenita (CLCN1 Exon 23, Australian Cattle Dog Variant)	Clear
✓ Myotonia Congenita (CLCN1 Exon 19, Labrador Retriever Variant)	Clear
✓ Myotonia Congenita (CLCN1 Exon 7, Miniature Schnauzer Variant)	Clear
✓ Narcolepsy (HCRTR2 Exon 1, Dachshund Variant)	Clear

OTHER RESULTS

✔ Narcolepsy (HCRT2 Intron 4, Doberman Pinscher Variant)	Clear
✔ Narcolepsy (HCRT2 Intron 6, Labrador Retriever Variant)	Clear
✔ Nemaline Myopathy (NEB, American Bulldog Variant)	Clear
✔ Neonatal Cerebellar Cortical Degeneration (SPTBN2, Beagle Variant)	Clear
✔ Neonatal Interstitial Lung Disease (LAMP3)	Clear
✔ Neuroaxonal Dystrophy, NAD (VPS11, Rottweiler Variant)	Clear
✔ Neuroaxonal Dystrophy, NAD (TECPR2, Spanish Water Dog Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 1, NCL 1 (PPT1 Exon 8, Dachshund Variant 1)	Clear
✔ Neuronal Ceroid Lipofuscinosis 10, NCL 10 (CTSD Exon 5, American Bulldog Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 2, NCL 2 (TPP1 Exon 4, Dachshund Variant 2)	Clear
✔ Neuronal Ceroid Lipofuscinosis 5, NCL 5 (CLN5 Exon 4 SNP, Border Collie Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 6, NCL 6 (CLN6 Exon 7, Australian Shepherd Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 7, NCL 7 (MFSD8, Chihuahua and Chinese Crested Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 8, NCL 8 (CLN8, Australian Shepherd Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 8, NCL 8 (CLN8 Exon 2, English Setter Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 8, NCL 8 (CLN8 Insertion, Saluki Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis, Cerebellar Ataxia, NCL4A (ARSG Exon 2, American Staffordshire Terrier Variant)	Clear
✔ Oculocutaneous Albinism, OCA (SLC45A2 Exon 6, Bullmastiff Variant)	Clear

OTHER RESULTS

 Oculocutaneous Albinism, OCA (SLC45A2, Small Breed Variant)	Clear
 Oculoskeletal Dysplasia 2 (COL9A2, Samoyed Variant)	Clear
 Osteogenesis Imperfecta (COL1A2, Beagle Variant)	Clear
 Osteogenesis Imperfecta (SERPINH1, Dachshund Variant)	Clear
 P2Y12 Receptor Platelet Disorder (P2Y12)	Clear
 Pachyonychia Congenita (KRT16, Dogue de Bordeaux Variant)	Clear
 Paroxysmal Dyskinesia, PxD (PIGN)	Clear
 Persistent Mullerian Duct Syndrome, PMDS (AMHR2)	Clear
 Pituitary Dwarfism (POU1F1 Intron 4, Karelian Bear Dog Variant)	Clear
 Platelet Factor X Receptor Deficiency, Scott Syndrome (TMEM16F)	Clear
 Polycystic Kidney Disease, PKD (PKD1)	Clear
 Pompe's Disease (GAA, Finnish and Swedish Lapphund, Lapponian Herder Variant)	Clear
 Prekallikrein Deficiency (KLKB1 Exon 8)	Clear
 Primary Ciliary Dyskinesia, PCD (NME5, Alaskan Malamute Variant)	Clear
 Primary Ciliary Dyskinesia, PCD (STK36, Australian Shepherd Variant)	Clear
 Primary Ciliary Dyskinesia, PCD (CCDC39 Exon 3, Old English Sheepdog Variant)	Clear
 Primary Hyperoxaluria (AGXT)	Clear
 Primary Lens Luxation (ADAMTS17)	Clear

OTHER RESULTS

✓ Primary Open Angle Glaucoma (ADAMTS17 Exon 11, Basset Fauve de Bretagne Variant)	Clear
✓ Primary Open Angle Glaucoma (ADAMTS10 Exon 17, Beagle Variant)	Clear
✓ Primary Open Angle Glaucoma (ADAMTS10 Exon 9, Norwegian Elkhound Variant)	Clear
✓ Primary Open Angle Glaucoma and Primary Lens Luxation (ADAMTS17 Exon 2, Chinese Shar-Pei Variant)	Clear
✓ Progressive Retinal Atrophy (SAG)	Clear
✓ Progressive Retinal Atrophy (IFT122 Exon 26, Lapponian Herder Variant)	Clear
✓ Progressive Retinal Atrophy 5, PRA5 (NECAP1 Exon 6, Giant Schnauzer Variant)	Clear
✓ Progressive Retinal Atrophy, Bardet-Biedl Syndrome (BBS2 Exon 11, Shetland Sheepdog Variant)	Clear
✓ Progressive Retinal Atrophy, CNGA (CNGA1 Exon 9)	Clear
✓ Progressive Retinal Atrophy, crd1 (PDE6B, American Staffordshire Terrier Variant)	Clear
✓ Progressive Retinal Atrophy, crd4/cord1 (RPGRIP1)	Clear
✓ Progressive Retinal Atrophy, PRA1 (CNGB1)	Clear
✓ Progressive Retinal Atrophy, PRA3 (FAM161A)	Clear
✓ Progressive Retinal Atrophy, rcd1 (PDE6B Exon 21, Irish Setter Variant)	Clear
✓ Progressive Retinal Atrophy, rcd3 (PDE6A)	Clear
✓ Proportionate Dwarfism (GH1 Exon 5, Chihuahua Variant)	Clear
✓ Protein Losing Nephropathy, PLN (NPHS1)	Clear
✓ Pyruvate Dehydrogenase Deficiency (PDP1, Spaniel Variant)	Clear

OTHER RESULTS

 Pyruvate Kinase Deficiency (PKLR Exon 5, Basenji Variant)	Clear
 Pyruvate Kinase Deficiency (PKLR Exon 7, Beagle Variant)	Clear
 Pyruvate Kinase Deficiency (PKLR Exon 10, Terrier Variant)	Clear
 Pyruvate Kinase Deficiency (PKLR Exon 7, Labrador Retriever Variant)	Clear
 Pyruvate Kinase Deficiency (PKLR Exon 7, Pug Variant)	Clear
 Raine Syndrome (FAM20C)	Clear
 Recurrent Inflammatory Pulmonary Disease, RIPD (AKNA, Rough Collie Variant)	Clear
 Renal Cystadenocarcinoma and Nodular Dermatofibrosis (FLCN Exon 7)	Clear
 Sensory Neuropathy (FAM134B, Border Collie Variant)	Clear
 Severe Combined Immunodeficiency, SCID (PRKDC, Terrier Variant)	Clear
 Severe Combined Immunodeficiency, SCID (RAG1, Wetterhoun Variant)	Clear
 Shaking Puppy Syndrome (PLP1, English Springer Spaniel Variant)	Clear
 Shar-Pei Autoinflammatory Disease, SPAID, Shar-Pei Fever (MTBP)	Clear
 Skeletal Dysplasia 2, SD2 (COL11A2, Labrador Retriever Variant)	Clear
 Skin Fragility Syndrome (PKP1, Chesapeake Bay Retriever Variant)	Clear
 Spinocerebellar Ataxia (SCN8A, Alpine Dachsbracke Variant)	Clear
 Spinocerebellar Ataxia with Myokymia and/or Seizures (KCNJ10)	Clear
 Spongy Degeneration with Cerebellar Ataxia 1 (KCNJ10)	Clear

OTHER RESULTS

 Spongy Degeneration with Cerebellar Ataxia 2 (ATP1B2)	Clear
 Stargardt Disease (ABCA4 Exon 28, Labrador Retriever Variant)	Clear
 Succinic Semialdehyde Dehydrogenase Deficiency (ALDH5A1 Exon 7, Saluki Variant)	Clear
 Thrombopathia (RASGRP1 Exon 5, American Eskimo Dog Variant)	Clear
 Thrombopathia (RASGRP1 Exon 5, Basset Hound Variant)	Clear
 Thrombopathia (RASGRP1 Exon 8, Landseer Variant)	Clear
 Trapped Neutrophil Syndrome, TNS (VPS13B)	Clear
 Ullrich-like Congenital Muscular Dystrophy (COL6A3 Exon 10, Labrador Retriever Variant)	Clear
 Ullrich-like Congenital Muscular Dystrophy (COL6A1 Exon 3, Landseer Variant)	Clear
 Unilateral Deafness and Vestibular Syndrome (PTPRQ Exon 39, Doberman Pinscher)	Clear
 Urate Kidney & Bladder Stones (SLC2A9)	Clear
 Von Willebrand Disease Type II, Type II vWD (VWF, Pointer Variant)	Clear
 Von Willebrand Disease Type III, Type III vWD (VWF Exon 4, Terrier Variant)	Clear
 Von Willebrand Disease Type III, Type III vWD (VWF Intron 16, Nederlandse Kooikerhondje Variant)	Clear
 Von Willebrand Disease Type III, Type III vWD (VWF Exon 7, Shetland Sheepdog Variant)	Clear
 X-Linked Hereditary Nephropathy, XLHN (COL4A5 Exon 35, Samoyed Variant 2)	Clear
 X-Linked Myotubular Myopathy (MTM1, Labrador Retriever Variant)	Clear
 X-Linked Progressive Retinal Atrophy 1, XL-PRA1 (RPGR)	Clear

OTHER RESULTS

	X-linked Severe Combined Immunodeficiency, X-SCID (IL2RG Exon 1, Basset Hound Variant)	Clear
	X-linked Severe Combined Immunodeficiency, X-SCID (IL2RG, Corgi Variant)	Clear
	Xanthine Urolithiasis (XDH, Mixed Breed Variant)	Clear
	β-Mannosidosis (MANBA Exon 16, Mixed-Breed Variant)	Clear
	Mast Cell Tumor	No result

HEALTH REPORT

Increased risk result

Intervertebral Disc Disease (Type I)

Alice inherited one copy of the variant we tested for Chondrodystrophy and Intervertebral Disc Disease, CDDY/IVDD, Type I IVDD. Alice is at increased risk for Type I IVDD.

How to interpret this result

Alice has one copy of an FGF4 retrogene on chromosome 12. In some breeds such as Beagles, Cocker Spaniels, and Dachshunds (among others) this variant is found in nearly all dogs. While those breeds are known to have an elevated risk of IVDD, many dogs in those breeds never develop IVDD. For mixed breed dogs and purebreds of other breeds where this variant is not as common, risk for Type I IVDD is greater for individuals with this variant than for similar dogs.

What is Chondrodystrophy and Intervertebral Disc Disease, CDDY/IVDD, Type I IVDD?

Type I Intervertebral Disc Disease (IVDD) is a back/spine issue that refers to a health condition affecting the discs that act as cushions between vertebrae. With Type I IVDD, affected dogs can have a disc event where it ruptures or herniates towards the spinal cord. This pressure on the spinal cord causes neurologic signs which can range from a wobbly gait to impairment of movement. Chondrodystrophy (CDDY) refers to the relative proportion between a dog's legs and body, wherein the legs are shorter and the body longer. There are multiple different variants that can cause a markedly chondrodystrophic appearance as observed in Dachshunds and Corgis. However, this particular variant is the only one known to also increase the risk for IVDD.

When signs & symptoms develop in affected dogs

Signs of CDDY are recognized in puppies as it affects body shape. IVDD is usually first recognized in adult dogs, with breed specific differences in age of onset.

Signs & symptoms

Research indicates that dogs with one or two copies of this variant have a similar risk of developing IVDD. However, there are some breeds (e.g. Beagles and Cocker Spaniels, among others) where this variant has been passed down to nearly all dogs of the breed and most do not show overt clinical signs of the disorder. This suggests that there are other genetic and environmental factors (such as weight, mobility, and family history) that contribute to an individual dog's risk of developing clinical IVDD. Signs of IVDD include neck or back pain, a change in your dog's walking pattern (including dragging of the hind limbs), and paralysis. These signs can be mild to severe, and if your dog starts exhibiting these signs, you should schedule an appointment with your veterinarian for a diagnosis.

How vets diagnose this condition

For CDDY, dogs with one copy of this variant may have mild proportional differences in their leg length. Dogs with two copies of this variant will often have visually longer bodies and shorter legs. For IVDD, a neurological exam will be performed on any dog showing suspicious signs. Based on the result of this exam, radiographs to detect the presence of calcified discs or advanced imaging (MRI/CT) to detect a disc rupture may be recommended.

How this condition is treated

IVDD is treated differently based on the severity of the disease. Mild cases often respond to medical management which includes

HEALTH REPORT

Notable result

ALT Activity

Alice inherited both copies of the variant we tested for Alanine Aminotransferase Activity

Why is this important to your vet?

Alice has two copies of a variant in the GPT gene and is likely to have a lower than average baseline ALT activity. ALT is a commonly used measure of liver health on routine veterinary blood chemistry panels. As such, your veterinarian may want to watch for changes in Alice's ALT activity above their current, healthy, ALT activity. As an increase above Alice's baseline ALT activity could be evidence of liver damage, even if it is within normal limits by standard ALT reference ranges.

What is Alanine Aminotransferase Activity?

Alanine aminotransferase (ALT) is a clinical tool that can be used by veterinarians to better monitor liver health. This result is not associated with liver disease. ALT is one of several values veterinarians measure on routine blood work to evaluate the liver. It is a naturally occurring enzyme located in liver cells that helps break down protein. When the liver is damaged or inflamed, ALT is released into the bloodstream.

How vets diagnose this condition

Genetic testing is the only way to provide your veterinarian with this clinical tool.

How this condition is treated

Veterinarians may recommend blood work to establish a baseline ALT value for healthy dogs with one or two copies of this variant.

HEALTH REPORT

Notable result

Copper Toxicosis (Attenuating)

Alice inherited one copy of the variant we tested for Copper Toxicosis (Attenuating)

Why is this important to your vet?

Alice has a genotype at the ATP7A gene that modifies and may help mitigate some of the symptoms from dogs with variants at ATP7B (<https://my.embarkvet.com/members/results/health/condition/140102?i=5>). This variant is not associated with an increased risk of any disease. As this variant resides on the X- chromosome, male dogs with one copy of the variant are better protected from copper accumulation due to the ATP7B variant than female dogs with one copy of the variant.

What is Copper Toxicosis (Attenuating)?

The ATP7A variant is considered beneficial and may be best described as a helpful modifier of the harmful copper toxicosis variant ATP7B (<https://my.embarkvet.com/members/results/health/condition/140102?i=5>). The ATP7A variant may help mitigate some of the symptoms of dogs with variants at ATP7B. Dogs with the ATP7A variant have not been observed to have any beneficial or harmful complications if they have two copies of the normal ATP7B variant.

When signs & symptoms develop in affected dogs

A variant in this gene may delay or have no effect on the onset of clinical signs of copper toxicosis in dogs with the ATP7B (<https://my.embarkvet.com/members/results/health/condition/140102?i=5>) variant. If your dog has the ATP7B variant, please read more about the age of onset on the ATP7B page.

How vets diagnose this condition

No diagnostics are required for this variant. If your dog has the ATP7B (<https://my.embarkvet.com/members/results/health/condition/140102?i=5>) variant, please read what diagnostics may be considered on the ATP7B page.

How this condition is treated

No treatment is required for this variant. If your dog has the ATP7B (<https://my.embarkvet.com/members/results/health/condition/140102?i=5>) variant, please read the available treatment on the ATP7B page.

Actions to take if your dog is affected

- No actions are required for dogs with this variant. If your dog has the ATP7B (<https://my.embarkvet.com/members/results/health/condition/140102?i=5>) variant, please read what actions you can take on the ATP7B page.

INBREEDING AND DIVERSITY

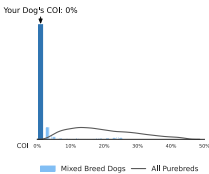
CATEGORY

RESULT

Inbreeding | Gene: *n/a* | Genetic Result: **0%**

Inbreeding is a measure of how closely related this dog’s parents were. The higher the number, the more closely related the parents. In general, greater inbreeding is associated with increased incidence of genetically inherited conditions.

0%

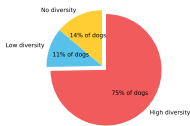


Immune Response 1 | Gene: *DRB1* | Genetic Result: **High Diversity**

Diversity in the Major Histocompatibility Complex (MHC) region of the genome has been found in some studies to be associated with the incidence of certain autoimmune diseases. Dogs that have less diversity in the MHC region—i.e. the Dog Leukocyte Antigen (DLA) inherited from the mother is similar to the DLA inherited from the father—are considered less immunologically diverse. A High Diversity result means the dog has two highly dissimilar haplotypes. A Low Diversity result means the dog has two similar but not identical haplotypes. A No Diversity result means the dog has inherited identical haplotypes from both parents. Some studies have shown associations between certain DRB1 haplotypes and autoimmune diseases such as Cushing's disease, but these findings have yet to be scientifically validated.

High Diversity

How common is this amount of diversity in mixed breed dogs:



Immune Response 2 | Gene: *DQA1 and DQB1* | Genetic Result: **High Diversity**

Diversity in the Major Histocompatibility Complex (MHC) region of the genome has been found in some studies to be associated with the incidence of certain autoimmune diseases. Dogs that have less diversity in the MHC region—i.e. the Dog Leukocyte Antigen (DLA) inherited from the mother is similar to the DLA inherited from the father—are considered less immunologically diverse. A High Diversity result means the dog has two highly dissimilar haplotypes. A Low Diversity result means the dog has two similar but not identical haplotypes. A No Diversity result means the dog has inherited identical haplotypes from both parents. A number of studies have shown correlations of DQA-DQB1 haplotypes and certain autoimmune diseases; however, these have not yet been scientifically validated.

High Diversity

How common is this amount of diversity in mixed breed dogs:

