



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

BREED MIX

- Poodle (Small) : 43.1%
- Poodle (Standard) : 32.5%
- Cocker Spaniel : 12.1%
- English Cocker Spaniel : 7.1%
- Labrador Retriever : 5.2%

GENETIC STATS

Predicted adult weight: **21 lbs**
 Life stage: **Puppy**
 Based on your dog's date of birth provided.

TEST DETAILS

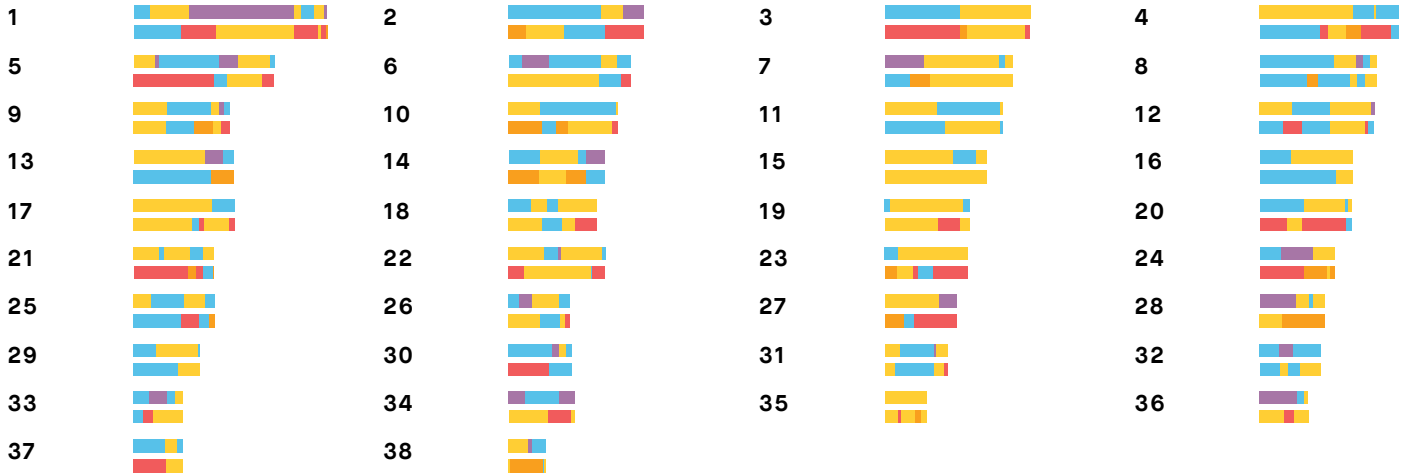
Kit number: EM-52350231
 Swab number: 31250360108360

BREED MIX BY CHROMOSOME

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

Breed colors:

- Poodle (Small)
- Poodle (Standard)
- Cocker Spaniel
- English Cocker Spaniel
- Labrador Retriever





"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

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.



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

POODLE (STANDARD)



The Standard Poodle is a popular, water-loving dog used for centuries as a bird dog and popular pet. Poodles were established in Germany by the 15th century. Oddly enough, they are the national dog breed of France, and they were the most popular breed of dog in the United States throughout the 1960s and 70s. They're still quite popular today, owing to their intelligence, trainability, and non-shedding coats. Although well-known for their fancy fur, they're one of the most intelligent breeds of dog and require a lot of exercise and stimulation.

Fun Fact

From 1989 to 1991, John Suter raced a team of Poodles in the Iditarod. Although his teams placed in the back half of the pack, he managed to win \$2,000 in prize money before retiring his poodle team. The Iditarod has since changed its rules to specify that only northern dog breeds can compete.



"MURPHY"

MOONLIT ACRES MURPHY'S LAW

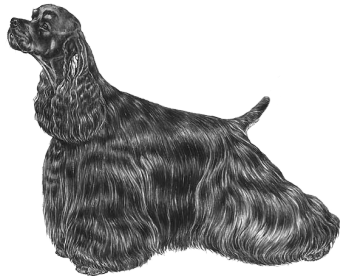


DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

COCKER SPANIEL



Fun Fact

A Cocker Spaniel named Lupo is the pet of the Duke and Duchess of Cambridge, also known as Prince William and Kate Middleton.

A beloved family dog, the popular Cocker Spaniel is a cheerful and merry breed. The Cocker Spaniel derives from the Spaniel family, originating in Spain with references dating back to the 14th century. By the 1800s, Spaniels were split between toy dogs and large hunting dogs. The Cocker Spaniel was named after its excellence in hunting woodcock. Although Spaniels were located in England for hundreds of years, they were not considered an individual breed until 1892 when the English Kennel Club recognized the Cocker Spaniel as an official breed. However, before this, English Cockers were being imported to America and were recognized by the AKC as an official breed in 1887. It was not until 1936 that they gained recognition by the AKC as English Cocker Spaniels, which were bigger than the American-type Cocker Spaniels. In 1938, a motion was passed not to breed the two types of Spaniels, which finally led to the distinction of Cocker Spaniels as their own breed. It may come as a surprise the Cocker Spaniels are sporting dogs, whose ability to adapt to household living may deceive you of their impressive agility and obedience skills. They are strong performers in conformation shows, while also capable of field work, portraying their well-rounded nature. The Cocker Spaniel is a soft and affectionate breed, that appreciates time and attention with the family. It should be noted that although they thrive on human interaction, the Cocker Spaniel's hunting instincts can kick in when out exercising so remember to keep them on a leash in a non-enclosed area. Due to their soft and gentle nature, a Cocker Spaniel can easily become nervous in unknown scenarios or with harsher training methods which can result in barking and sometimes submissive urination (be prepared!). The Cocker Spaniel is a visually impressive breed, whose thick and heavy coat requires constant grooming to prevent knots and tangles developing. It is common for Cocker Spaniels to seek professional assistance in keeping their pooch well groomed. This beloved family dog ranks as the 30th most popular breed.



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

ENGLISH COCKER SPANIEL



The English Cocker Spaniel is a breed of gun dog. There are "field" or "working" cockers and "show" cockers. An active sporting dog, the English Cocker Spaniel's compact, solid body practically vibrates with energy and enthusiasm, particularly when at work in the field. Although known for its soft, melting spaniel expression, the breed is a tough worker, capable of covering ground effortlessly and penetrating the densest of cover. His coat can be solid-colored (black, liver or shades of red) or parti-colored, including ticking or roaning. Prone to ear infections. During the summer, the ears should be checked often. Hanging close to the ground as they do, they can become host to ticks or burrs, often the cause of deafness. The Cocker can gain weight easily; do not overfeed.

Fun Fact

The Cocker is part of the royal family. The Duke and Duchess of Cambridge, also known as Prince William and Kate Middleton, adopted a cocker spaniel puppy in 2012. The puppy, named Lupo, is the son of a cocker spaniel owned by the duchess' mother. Lupo is the latest in a long line of dogs in the royal family.



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

LABRADOR RETRIEVER



The Labrador Retriever has been the most popular AKC breed in the United States every year for the past 25 years. Their origins have been traced to the St. John's dog, named for the capital city of the Canadian province "Newfoundland and Labrador." The St. John's was developed from imported European dogs for fishing and hunting on the island of Newfoundland in the 18th century. During the 19th century St John's were bred in England and developed into the Labradors we know and love. Labradors were recognized as a breed by the British Kennel Club in 1903 and by the AKC in 1917. With their friendly dispositions and weatherproof build, they are terrific family dogs and outdoor companions. Most Labradors are very active with an appetite to match, and need plenty of exercise. Labradors often love to swim. Their double-coated weather-resistant fur can cause heavy shedding. Great hunting dogs and popular household companions, Labrador Retrievers are also employed as guide dogs and search-and-rescue dogs.

Fun Fact

We're pretty sure Labradors came from the island of Newfoundland, and many experts believe that the Newfoundland breed was developed in neighboring Labrador! By our calculations, there are 10 times as many Labradors in North America than there are people living in Labrador and Newfoundland.



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

MATERNAL LINE



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

HAPLOGROUP: A1a

A1a is the most common maternal lineage among Western dogs. This lineage traveled from the site of dog domestication in Central Asia to Europe along with an early dog expansion perhaps 10,000 years ago. It hung around in European village dogs for many millennia. Then, about 300 years ago, some of the prized females in the line were chosen as the founding dogs for several dog breeds. That set in motion a huge expansion of this lineage. It's now the maternal lineage of the overwhelming majority of Mastiffs, Labrador Retrievers and Gordon Setters. About half of Boxers and less than half of Shar-Pei dogs descend from the A1a line. It is also common across the world among village dogs, a legacy of European colonialism.

HAPLOTYPE: A400

Part of the A1a haplogroup, this haplotype occurs most frequently in mixed breed dogs.



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

PATERNAL LINE



Through Murphy's Y chromosome we can trace his father's ancestry back to where dogs and people first became friends. This map helps you visualize the routes that his ancestors took to your home. Their story is described below the map.

HAPLOGROUP: A1a

Some of the wolves that became the original dogs in Central Asia around 15,000 years ago came from this long and distinguished line of male dogs. After domestication, they followed their humans from Asia to Europe and then didn't stop there. They took root in Europe, eventually becoming the dogs that founded the Vizsla breed 1,000 years ago. The Vizsla is a Central European hunting dog, and all male Vizslas descend from this line. During the Age of Exploration, like their owners, these pooches went by the philosophy, "Have sail, will travel!" From the windy plains of Patagonia to the snug and homey towns of the American Midwest, the beaches of a Pacific paradise, and the broad expanse of the Australian outback, these dogs followed their masters to the outposts of empires. Whether through good fortune or superior genetics, dogs from the A1a lineage traveled the globe and took root across the world. Now you find village dogs from this line frolicking on Polynesian beaches, hanging out in villages across the Americas, and scavenging throughout Old World settlements. You can also find this "prince of patrilineages" in breeds as different as German Shepherds, Golden Retrievers, Pugs, Border Collies, Scottish Terriers, and Irish Wolfhounds. No male wolf line has been as successful as the A1a line!

HAPLOTYPE: H1a.59

Part of the A1a haplogroup, this haplotype occurs most frequently in European village dogs.



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

TRAITS: COAT COLOR

TRAIT

RESULT

E Locus (MC1R)

The E Locus determines if and where a dog can produce dark (black or brown) hair. Dogs with two copies of the recessive **e** variant do not produce dark hairs and will express a red pigment called pheomelanin over their entire body. The shade of red, which can range from a deep copper to white, depends on other genetic factors, including the Intensity loci. In addition to determining if a dog can develop dark hairs, the E Locus can give a dog a black "mask" or "widow's peak" unless the dog has overriding coat color genetic factors.

No dark mask or grizzle (Ee)

Dogs with one or two copies of the **E^m** variant may have a melanistic mask (dark facial hair as commonly seen in the German Shepherd Dog and Pug). In the absence of **E^m**, dogs with the **E^g** variant can have a "grizzle" phenotype (darker color on the head and top with a melanistic "widow's peak" and a lighter underside, commonly seen in the Afghan Hound and Borzoi and also referred to as "domino"). In the absence of both **E^m** and **E** variants, dogs with the **E^a** or **E^h** variants can express the grizzle 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.

K Locus (CBD103)

The K Locus **K^B** allele "overrides" the A Locus, meaning that it prevents the A Locus genotype from affecting coat color. For this reason, the **K^B** allele is referred to as the "dominant black" allele. As a result, dogs with at least one **K^B** allele will usually have solid black or brown coats (or red/cream coats if they are **ee** at the E Locus) regardless of their genotype at the A Locus, although several other genes could impact the dog's coat and cause other patterns, such as white spotting. Dogs with the **k^Yk^Y** genotype will show a coat color pattern based on the genotype they have at the A Locus. Dogs who test as **K^Bk^Y** may be brindie rather than black or brown.

More likely to have a patterned haircoat (k^Yk^Y)



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

TRAITS: COAT COLOR (CONTINUED)

TRAIT

RESULT

Intensity Loci

Areas of a dog's coat where dark (black or brown) pigment is not expressed either contain red/yellow pigment, or no pigment at all. Five locations across five chromosomes explain approximately 70% of red pigmentation "intensity" variation across all dogs. Dogs with a result of **Intense Red Pigmentation** will likely have deep red hair like an Irish Setter or "apricot" hair like some Poodles, dogs with a result of **Intermediate Red Pigmentation** will likely have tan or yellow hair like a Soft-Coated Wheaten Terrier, and dogs with **Dilute Red Pigmentation** will likely have cream or white hair like a Samoyed. Because the mutations we test may not directly cause differences in red pigmentation intensity, we consider this to be a linkage test.

Any light hair likely apricot or red (Intense Red Pigmentation)

A Locus (ASIP)

The A Locus controls switching between black and red pigment in hair cells, but it will only be expressed in dogs that are not **ee** at the E Locus and are **k^Yk^Y** at the K Locus. Sable (also called "Fawn") dogs have a mostly or entirely red coat with some interspersed black hairs. Agouti (also called "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.

Black/Brown and tan coat color pattern (a⁺a⁺)

D Locus (MLPH)

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, will have all black pigment lightened ("diluted") to gray, or brown pigment lightened to lighter brown in their hair, skin, and sometimes eyes. There are many breed-specific names for these dilute colors, such as "blue", "charcoal", "fawn", "silver", and "Isabella". Note that in certain breeds, dilute dogs have a higher incidence of Color Dilution Alopecia. Dogs with one **d** allele will not be dilute, but can pass the **d** allele on to their puppies.

Dark areas of hair and skin are not lightened (DD)



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

TRAITS: COAT COLOR (CONTINUED)

TRAIT

RESULT

Cocoa (HPS3)

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** allele 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 **co** alleles, not expressed (NN)

B Locus (TYRP1)

Dogs with two copies of the **b** allele produce brown pigment instead of black in both their hair and skin. Dogs with one copy of the **b** allele will produce black pigment, but can pass the **b** allele on to their puppies. E Locus **ee** dogs that carry two **b** alleles will have red or cream coats, but have brown noses, eye rims, and footpads (sometimes referred to as "Dudley Nose" in Labrador Retrievers). "Liver" or "chocolate" is the preferred color term for brown in most breeds; in the Doberman Pinscher it is referred to as "red".

Brown hair and skin (bb)

Saddle Tan (RALY)

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 **ll** 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.

Likely saddle tan patterned (NN)

S Locus (MITF)

The S Locus determines white spotting and pigment distribution. MITF controls where pigment is produced, and an insertion in the MITF gene causes a loss of pigment in the coat and skin, resulting in white hair and/or pink skin. Dogs with two copies of this variant will likely have breed-dependent white patterning, with a nearly white, parti, or piebald coat. Dogs with one copy of this variant will have more limited white spotting and may be considered flash, parti or piebald. This MITF variant does not explain all white spotting patterns in dogs and other variants are currently being researched. Some dogs may have small amounts of white on the paws, chest, face, or tail regardless of their S Locus genotype.

Likely solid colored, but may have small amounts of white (Ssp)



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

TRAITS: COAT COLOR (CONTINUED)

TRAIT

RESULT

M Locus (PMEL)

Merle coat patterning is common to several dog breeds including the Australian Shepherd, Catahoula Leopard Dog, and Shetland Sheepdog, among many others. Merle arises from an unstable SINE insertion (which we term the "M*" allele) that disrupts activity of the pigmentary gene PMEL, leading to mottled or patchy coat color. Dogs with an **M*m** result are likely to be phenotypically 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 be phenotypically merle or double merle. Dogs with an **mm** result have no merle alleles and are unlikely to have a merle coat pattern.

No merle alleles (mm)

Note that Embark does not currently distinguish between the recently described cryptic, atypical, atypical+, classic, and harlequin merle alleles. Our merle test only detects the presence, but not the length of the SINE insertion. We do not recommend making breeding decisions on this result alone. Please pursue further testing for allelic distinction prior to breeding decisions.

R Locus (USH2A)

The R Locus regulates the presence or absence of the roan coat color pattern. Partial duplication of the USH2A gene is strongly associated with this coat pattern. Dogs with at least one **R** allele will likely have roaning on otherwise uniformly unpigmented white areas. Roan appears in white areas controlled by the S Locus but not in other white or cream areas created by other loci, such as the E Locus with **ee** along with Dilute Red Pigmentation by I Locus (for example, in Samoyeds). Mechanisms for controlling the extent of roaning are currently unknown, and roaning can appear in a uniform or non-uniform pattern. Further, non-uniform roaning may appear as ticking, and not obviously roan. The roan pattern can appear with or without ticking.

Likely roan patterned (Rr)

H Locus (Harlequin)

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. This trait is thought to be homozygous lethal; a living dog with an **HH** genotype has never been found.

No harlequin alleles (hh)



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

TRAITS: COAT COLOR (CONTINUED)

TRAIT

RESULT

Panda White Spotting

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 (NN)



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

TRAITS: OTHER COAT TRAITS

TRAIT

RESULT

Furnishings (RSP02)

Dogs with one or two copies of the **F** allele have "furnishings": the mustache, beard, and eyebrows characteristic of breeds like the Schnauzer, Scottish Terrier, and Wire Haired Dachshund. A dog with two **I** alleles will not have furnishings, which is sometimes called an "improper coat" in breeds where furnishings are part of the breed standard. The mutation is a genetic insertion which we measure indirectly using a linkage test highly correlated with the insertion.

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



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

TRAITS: OTHER COAT TRAITS (CONTINUED)

TRAIT

RESULT

Coat Length (FGF5)

The FGF5 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, while the **Sh** allele causes a shorter coat, as seen in the Boxer or the American Staffordshire Terrier. In certain breeds, such as the Pembroke Welsh Corgi and French Bulldog, the long haircoat is described as "fluffy". 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 alleles, 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 (LhLh)

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 the Afghan Hounds and Eurasiers.

Interestingly, the Lh3 variant, a 16 base pair deletion, encompasses the Lh4 variant (GG insertion). The presence of one or two copies of Lh3 influences the outcome at the Lh4 locus. When two copies of Lh3 are present, there will be no reportable result for the FGF5_Lh4 locus. With one copy of Lh3, Lh4 can have either one copy of the variant allele or the normal allele. The overall FGF5 result remains unaffected by this.



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

TRAITS: OTHER COAT TRAITS (CONTINUED)

TRAIT

RESULT

Shedding (MC5R)

Dogs with at least one copy of the ancestral **C** allele, like many Labradors and German Shepherd Dogs, are heavy or seasonal shedders, while those with two copies of the **T** allele, including many Boxers, Shih Tzus and Chihuahuas, tend to be lighter shedders. Dogs with furnished/wire-haired coats caused by RSPO2 (the furnishings gene) tend to be low shedders regardless of their genotype at this gene.

Likely light shedding (CC)

Coat Texture (KRT71)

Dogs with a long coat and at least one copy of the **T** allele have a wavy or curly coat characteristic of Poodles and Bichon Frises. Dogs with two copies of the ancestral **C** allele are likely to have a straight coat, but there are other factors that can cause a curly coat, for example if they at least one **F** allele for the Furnishings (RSPO2) gene then they are likely to have a curly coat. Dogs with short coats may carry one or two copies of the **T** allele but still have straight coats.

Likely wavy coat (CT)

Hairlessness (FOXI3)

A duplication in the FOXI3 gene causes hairlessness over most of the body as well as changes in tooth shape and number. This mutation occurs in Peruvian Inca Orchid, Xoloitzcuintli (Mexican Hairless), and Chinese Crested (other hairless breeds have different mutations). Dogs with the **NDup** genotype are likely to be hairless while dogs with the **NN** genotype are likely to have a normal coat. The **DupDup** genotype has never been observed, suggesting that dogs with that genotype cannot survive to birth. Please note that this is a linkage test, so it may not be as predictive as direct tests of the mutation in some lines.

Very unlikely to be hairless (NN)

Hairlessness (SGK3)

Hairlessness in the American Hairless Terrier arises from a mutation in the SGK3 gene. 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 (NN)



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

TRAITS: OTHER COAT TRAITS (CONTINUED)

TRAIT

RESULT

Oculocutaneous Albinism Type 2 (SLC45A2)

Dogs with two copies **DD** of this deletion in the SLC45A2 gene have oculocutaneous albinism (OCA), also known as Doberman Z Factor Albinism, a recessive condition characterized by severely reduced or absent pigment in the eyes, skin, and hair. Affected dogs sometimes suffer from vision problems due to lack of eye pigment (which helps direct and absorb ambient light) and are prone to sunburn. Dogs with a single copy of the deletion **ND** will not be affected but can pass the mutation on to their offspring. This particular mutation can be traced back to a single white Doberman Pinscher born in 1976, and it has only been observed in dogs descended from this individual. Please note that this is a linkage test, so it may not be as predictive as direct tests of the mutation in some lines.

Likely not albino (NN)



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

TRAITS: OTHER BODY FEATURES

TRAIT

RESULT

Muzzle Length (BMP3)

Dogs in medium-length muzzle (mesocephalic) breeds like Staffordshire Terriers and Labradors, and long muzzle (dolichocephalic) breeds like Whippet and Collie have one, or more commonly two, copies of the ancestral **C** allele. Dogs in many short-length muzzle (brachycephalic) breeds such as the English Bulldog, Pug, and Pekingese have two copies of the derived **A** allele. At least five different genes affect muzzle length in dogs, with BMP3 being the only one with a known causal mutation. For example, the skull shape of some breeds, including the dolichocephalic Scottish Terrier or the brachycephalic Japanese Chin, appear to be caused by other genes. Thus, dogs may have short or long muzzles due to other genetic factors that are not yet known to science.

Likely medium or long muzzle (CC)

Tail Length (T)

Whereas most dogs have two **C** alleles and a long tail, dogs with one **G** allele are likely to have a bobtail, which is an unusually short or absent tail. This mutation causes natural bobtail in many 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 the **GG** genotype do not survive to birth. Please note that this mutation does not explain every natural bobtail! 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, these breeds do not have this mutation. This suggests that other unknown genetic mutations can also lead to a natural bobtail.

Likely normal-length tail (CC)

Hind Dewclaws (LMBR1)

Common in certain breeds such as the Saint Bernard, hind dewclaws are extra, nonfunctional digits located midway between a dog's paw and hock. Dogs with at least one copy of the **T** allele have about a 50% chance of having hind dewclaws. Note that other (currently unknown to science) mutations can also cause hind dewclaws, so some **CC** or **TC** dogs will have hind dewclaws.

Unlikely to have hind dew claws (CC)



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

TRAITS: OTHER BODY FEATURES (CONTINUED)

TRAIT

RESULT

Chondrodysplasia (Chr. 18 FGF4 Retrogene)

Dogs with one or two copies of the **I** allele will exhibit a short-legged trait known as chondrodysplasia (CDPA). CDPA is a breed-defining characteristic of many breeds exhibiting the "short-legged, long-bodied" appearance known as disproportionate dwarfism, including the corgi, dachshund and basset hound. The impact of the **I** allele on leg length is additive. Therefore, 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. Breeds that display disproportionate dwarfism also frequently inherit a genetic variant known as the chondrodystrophy (CDDY) variant. The CDDY variant also shortens legs (in a less significant amount than CDPA) but, secondarily, increases the risk of Type I Intervertebral Disc Disease (IVDD). Test results for CDDY are listed in this dog's health testing results under "Intervertebral Disc Disease (Type I)". In contrast, the CDPA variant has NOT been shown to increase the risk of IVDD.

Not indicative of chondrodysplasia (normal leg length) (NN)

Blue Eye Color (ALX4)

Embark researchers discovered this large duplication associated with blue eyes in Arctic breeds like Siberian Husky as well as tri-colored (non-merle) Australian Shepherds. Dogs with at least one copy of the duplication (**Dup**) are more likely to have at least one blue eye. Some dogs with the duplication may have only one blue eye (complete heterochromia) or may not have blue eyes at all; nevertheless, they can still pass the duplication and the trait to their offspring. **NN** dogs do not carry this duplication, but may have blue eyes due to other factors, such as merle. Please note that this is a linkage test, so it may not be as predictive as direct tests of the mutation in some lines.

Less likely to have blue eyes (NN)

Back Muscling & Bulk, Large Breed (ACSL4)

The **T** allele is associated with 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. The "bulky" **T** allele is absent from leaner shaped large breed dogs like the Great Dane, Irish Wolfhound, and Scottish Deerhound, which are fixed for the ancestral **C** allele. Note that this mutation does not seem to affect muscling in small or even mid-sized dog breeds with notable back muscling, including the American Staffordshire Terrier, Boston Terrier, and the English Bulldog.

Likely normal muscling (CC)



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

TRAITS: BODY SIZE

| TRAIT | RESULT |
|--|--------------------------|
| Body Size (IGF1) The I allele is associated with smaller body size. | Smaller (II) |
| Body Size (IGFR1) The A allele is associated with smaller body size. | Larger (GG) |
| Body Size (STC2) The A allele is associated with smaller body size. | Intermediate (TA) |
| Body Size (GHR - E191K) The A allele is associated with smaller body size. | Smaller (AA) |
| Body Size (GHR - P177L) The T allele is associated with smaller body size. | Intermediate (CT) |



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

TRAITS: PERFORMANCE

TRAIT

RESULT

Altitude Adaptation (EPAS1)

This mutation causes dogs to be especially tolerant of low oxygen environments (hypoxia), such as those found at high elevations. Dogs with at least one **A** allele are less susceptible to "altitude sickness." This mutation was originally identified in breeds from high altitude areas such as the Tibetan Mastiff.

Normal altitude tolerance (GG)

Appetite (POMC)

This mutation in the POMC gene is found primarily in Labrador and Flat Coated Retrievers. Compared to dogs with no copies of the mutation (**NN**), dogs with one (**ND**) or two (**DD**) copies of the mutation are more likely to have high food motivation, which can cause them 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.

Normal food motivation (NN)



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

HEALTH REPORT

How to interpret Murphy's genetic health results:

If Murphy 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 Murphy 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

Murphy is not at increased risk for the genetic health conditions that Embark tests.

✔ Clear results

Breed-relevant (34)

Other (239)



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

BREED-RELEVANT RESULTS

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

| | |
|--|-------|
| ✓ Acral Mutilation Syndrome (GDNF-AS, Spaniel and Pointer Variant) | Clear |
| ✓ Alexander Disease (GFAP) | Clear |
| ✓ Bernard-Soulier Syndrome, BSS (GP9, Cocker Spaniel Variant) | Clear |
| ✓ Canine Elliptocytosis (SPTB Exon 30) | Clear |
| ✓ Centronuclear Myopathy, CNM (PTPLA) | Clear |
| ✓ Congenital Dyserythropoietic Anemia and Polymyopathy (EHPB1L1, Labrador Retriever Variant) | Clear |
| ✓ Congenital Myasthenic Syndrome, CMS (COLQ, Labrador Retriever Variant) | Clear |
| ✓ Copper Toxicosis (Accumulating) (ATP7B) | Clear |
| ✓ Day Blindness (CNGA3 Exon 7, Labrador Retriever Variant) | Clear |
| ✓ Degenerative Myelopathy, DM (SOD1A) | Clear |
| ✓ Ehlers-Danlos Syndrome (EDS) (COL5A1, Labrador Retriever Variant) | Clear |
| ✓ Exercise-Induced Collapse, EIC (DNM1) | Clear |
| ✓ Familial Nephropathy (COL4A4 Exon 3, Cocker Spaniel Variant) | Clear |
| ✓ Glycogen storage disease Type VII, Phosphofructokinase Deficiency, PFK Deficiency (PFKM, Whippet and English Springer Spaniel Variant) | Clear |
| ✓ GM2 Gangliosidosis (HEXB, Poodle Variant) | Clear |
| ✓ Golden Retriever Progressive Retinal Atrophy 2, GR-PRA2 (TTC8) | Clear |
| ✓ Hereditary Nasal Parakeratosis, HNPk (SUV39H2) | Clear |
| ✓ Intervertebral Disc Disease (Type I) (FGF4 retrogene - CFA12) | Clear |



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

BREED-RELEVANT RESULTS

| | |
|---|-------|
| <input checked="" type="checkbox"/> Laryngeal Paralysis and Polyneuropathy (CNTNAP1, Leonberger, Saint Bernard, and Labrador Retriever variant) | Clear |
| <input checked="" type="checkbox"/> Macular Corneal Dystrophy, MCD (CHST6) | Clear |
| <input checked="" type="checkbox"/> Muscular Dystrophy-Dystroglycanopathy (LARGE1, Labrador Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Myotonia Congenita (CLCN1 Exon 19, Labrador Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Narcolepsy (HCRTR2 Intron 6, Labrador Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Neonatal Encephalopathy with Seizures, NEWS (ATF2) | Clear |
| <input checked="" type="checkbox"/> Osteochondrodysplasia (SLC13A1, Poodle Variant) | Clear |
| <input checked="" type="checkbox"/> Progressive Retinal Atrophy, crd4/cord1 (RPGRIP1) | Clear |
| <input checked="" type="checkbox"/> Progressive Retinal Atrophy, prcd (PRCD Exon 1) | Clear |
| <input checked="" type="checkbox"/> Pyruvate Kinase Deficiency (PKLR Exon 7, Labrador Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Skeletal Dysplasia 2, SD2 (COL11A2, Labrador Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Stargardt Disease (ABCA4 Exon 28, Labrador Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Ullrich-like Congenital Muscular Dystrophy (COL6A3 Exon 10, Labrador Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Urate Kidney & Bladder Stones (SLC2A9) | Clear |
| <input checked="" type="checkbox"/> Von Willebrand Disease Type I, Type I vWD (VWF) | Clear |
| <input checked="" type="checkbox"/> X-Linked Myotubular Myopathy (MTM1, Labrador Retriever Variant) | Clear |





"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

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

| | |
|--|-------|
| ✔ 2-DHA Kidney & Bladder Stones (APRT) | Clear |
| ✔ Alaskan Husky Encephalopathy (SLC19A3) | Clear |
| ✔ Alaskan Malamute Polyneuropathy, AMPN (NDRG1 SNP) | Clear |
| ✔ ALT Activity (GPT) | Clear |
| ✔ Anhidrotic Ectodermal Dysplasia (EDA Intron 8) | Clear |
| ✔ Autosomal Dominant Progressive Retinal Atrophy (RHO) | Clear |
| ✔ Bald Thigh Syndrome (IGFBP5) | Clear |
| ✔ Bully Whippet Syndrome (MSTN) | 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 |
| ✔ 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 |
| ✔ Cerebellar Hypoplasia (VLDLR, Eurasier Variant) | Clear |



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

| | |
|--|-------|
| <input checked="" type="checkbox"/> Chondrodysplasia (ITGA10, Norwegian Elkhound and Karelian Bear Dog Variant) | Clear |
| <input checked="" type="checkbox"/> Cleft Lip and/or Cleft Palate (ADAMTS20, Nova Scotia Duck Tolling Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Cleft Palate, CP1 (DLX6 intron 2, Nova Scotia Duck Tolling Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Cobalamin Malabsorption (CUBN Exon 8, Beagle Variant) | Clear |
| <input checked="" type="checkbox"/> Cobalamin Malabsorption (CUBN Exon 53, Border Collie Variant) | Clear |
| <input checked="" type="checkbox"/> Collie Eye Anomaly (NHEJ1) | Clear |
| <input checked="" type="checkbox"/> Complement 3 Deficiency, C3 Deficiency (C3) | Clear |
| <input checked="" type="checkbox"/> Congenital Cornification Disorder (NSDHL, Chihuahua Variant) | Clear |
| <input checked="" type="checkbox"/> Congenital Hypothyroidism (TPO, Rat, Toy, Hairless Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Congenital Hypothyroidism (TPO, Tenterfield Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Congenital Hypothyroidism with Goiter (TPO Intron 13, French Bulldog Variant) | Clear |
| <input checked="" type="checkbox"/> Congenital Hypothyroidism with Goiter (SLC5A5, Shih Tzu Variant) | Clear |
| <input checked="" type="checkbox"/> Congenital Macrothrombocytopenia (TUBB1 Exon 1, Cairn and Norfolk Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Congenital Muscular Dystrophy (LAMA2, Italian Greyhound) | Clear |
| <input checked="" type="checkbox"/> Congenital Myasthenic Syndrome, CMS (COLQ, Golden Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Congenital Myasthenic Syndrome, CMS (CHAT, Old Danish Pointing Dog Variant) | Clear |
| <input checked="" type="checkbox"/> Congenital Myasthenic Syndrome, CMS (CHRNE, Jack Russell Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Congenital Stationary Night Blindness (LRIT3, Beagle Variant) | Clear |



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

| | |
|--|-------|
| <input checked="" type="checkbox"/> Congenital Stationary Night Blindness (RPE65, Briard Variant) | Clear |
| <input checked="" type="checkbox"/> Copper Toxicosis (Attenuating) (ATP7A, Labrador Retriever) | Clear |
| <input checked="" type="checkbox"/> Copper Toxicosis (Attenuating) (RETN, Labrador Retriever) | Clear |
| <input checked="" type="checkbox"/> Craniomandibular Osteopathy, CMO (SLC37A2) | Clear |
| <input checked="" type="checkbox"/> Craniomandibular Osteopathy, CMO (SLC37A2 Intron 16, Basset Hound Variant) | Clear |
| <input checked="" type="checkbox"/> Cystinuria Type I-A (SLC3A1, Newfoundland Variant) | Clear |
| <input checked="" type="checkbox"/> Cystinuria Type II-A (SLC3A1, Australian Cattle Dog Variant) | Clear |
| <input checked="" type="checkbox"/> Cystinuria Type II-B (SLC7A9, Miniature Pinscher Variant) | Clear |
| <input checked="" type="checkbox"/> Darier Disease (ATP2A2, Irish Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Day Blindness (CNGB3 Deletion, Alaskan Malamute Variant) | Clear |
| <input checked="" type="checkbox"/> Day Blindness (CNGA3 Exon 7, German Shepherd Variant) | Clear |
| <input checked="" type="checkbox"/> Day Blindness (CNGB3 Exon 6, German Shorthaired Pointer Variant) | Clear |
| <input checked="" type="checkbox"/> Deafness and Vestibular Syndrome of Dobermans, DVDob, DINGS (MYO7A) | Clear |
| <input checked="" type="checkbox"/> Demyelinating Polyneuropathy (SBF2/MTRM13) | Clear |
| <input checked="" type="checkbox"/> Dental-Skeletal-Retinal Anomaly (MIA3, Cane Corso Variant) | Clear |
| <input checked="" type="checkbox"/> Diffuse Cystic Renal Dysplasia and Hepatic Fibrosis (INPP5E Intron 9, Norwich Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Dilated Cardiomyopathy, DCM (RBM20, Schnauzer Variant) | Clear |
| <input checked="" type="checkbox"/> Dilated Cardiomyopathy, DCM1 (PDK4, Doberman Pinscher Variant 1) | Clear |



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

| | |
|---|-------|
| <input checked="" type="checkbox"/> Dilated Cardiomyopathy, DCM2 (TTN, Doberman Pinscher Variant 2) | Clear |
| <input checked="" type="checkbox"/> Disproportionate Dwarfism (PRKG2, Dogo Argentino Variant) | Clear |
| <input checked="" type="checkbox"/> Dry Eye Curly Coat Syndrome (FAM83H Exon 5) | Clear |
| <input checked="" type="checkbox"/> Dystrophic Epidermolysis Bullosa (COL7A1, Central Asian Shepherd Dog Variant) | Clear |
| <input checked="" type="checkbox"/> Dystrophic Epidermolysis Bullosa (COL7A1, Golden Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Early Bilateral Deafness (LOXHD1 Exon 38, Rottweiler Variant) | Clear |
| <input checked="" type="checkbox"/> Early Onset Adult Deafness, EOAD (EPS8L2 Deletion, Rhodesian Ridgeback Variant) | Clear |
| <input checked="" type="checkbox"/> Early Onset Cerebellar Ataxia (SEL1L, Finnish Hound Variant) | Clear |
| <input checked="" type="checkbox"/> Ehlers Danlos (ADAMTS2, Doberman Pinscher Variant) | Clear |
| <input checked="" type="checkbox"/> Enamel Hypoplasia (ENAM Deletion, Italian Greyhound Variant) | Clear |
| <input checked="" type="checkbox"/> Enamel Hypoplasia (ENAM SNP, Parson Russell Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Episodic Falling Syndrome (BCAN) | Clear |
| <input checked="" type="checkbox"/> Factor VII Deficiency (F7 Exon 5) | Clear |
| <input checked="" type="checkbox"/> Factor XI Deficiency (F11 Exon 7, Kerry Blue Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Familial Nephropathy (COL4A4 Exon 30, English Springer Spaniel Variant) | Clear |
| <input checked="" type="checkbox"/> Fanconi Syndrome (FAN1, Basenji Variant) | Clear |
| <input checked="" type="checkbox"/> Fetal-Onset Neonatal Neuroaxonal Dystrophy (MFN2, Giant Schnauzer Variant) | Clear |
| <input checked="" type="checkbox"/> Glanzmann's Thrombasthenia Type I (ITGA2B Exon 13, Great Pyrenees Variant) | Clear |



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

| | |
|---|-------|
| <input checked="" type="checkbox"/> Glanzmann's Thrombasthenia Type I (ITGA2B Exon 12, Otterhound Variant) | Clear |
| <input checked="" type="checkbox"/> Globoid Cell Leukodystrophy, Krabbe disease (GALC Exon 5, Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Glycogen Storage Disease Type IA, Von Gierke Disease, GSD IA (G6PC1, German Pinscher Variant) | Clear |
| <input checked="" type="checkbox"/> Glycogen Storage Disease Type IA, Von Gierke Disease, GSD IA (G6PC, Maltese Variant) | Clear |
| <input checked="" type="checkbox"/> Glycogen Storage Disease Type IIIA, GSD IIIA (AGL, Curly Coated Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Glycogen storage disease Type VII, Phosphofructokinase Deficiency, PFK Deficiency (PFKM, Wachtelhund Variant) | Clear |
| <input checked="" type="checkbox"/> GM1 Gangliosidosis (GLB1 Exon 2, Portuguese Water Dog Variant) | Clear |
| <input checked="" type="checkbox"/> GM1 Gangliosidosis (GLB1 Exon 15, Shiba Inu Variant) | Clear |
| <input checked="" type="checkbox"/> GM1 Gangliosidosis (GLB1 Exon 15, Alaskan Husky Variant) | Clear |
| <input checked="" type="checkbox"/> GM2 Gangliosidosis (HEXA, Japanese Chin Variant) | Clear |
| <input checked="" type="checkbox"/> Golden Retriever Progressive Retinal Atrophy 1, GR-PRA1 (SLC4A3) | Clear |
| <input checked="" type="checkbox"/> Goniodysgenesis and Glaucoma, Pectinate Ligament Dysplasia, PLD (OLFM3) | Clear |
| <input checked="" type="checkbox"/> Hemophilia A (F8 Exon 11, German Shepherd Variant 1) | Clear |
| <input checked="" type="checkbox"/> Hemophilia A (F8 Exon 1, German Shepherd Variant 2) | Clear |
| <input checked="" type="checkbox"/> Hemophilia A (F8 Exon 10, Boxer Variant) | Clear |
| <input checked="" type="checkbox"/> Hemophilia B (F9 Exon 7, Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Hemophilia B (F9 Exon 7, Rhodesian Ridgeback Variant) | Clear |
| <input checked="" type="checkbox"/> Hereditary Ataxia (PNPLA8, Australian Shepherd Variant) | Clear |





"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

| | |
|--|-------|
| <input checked="" type="checkbox"/> Hereditary Ataxia, Cerebellar Degeneration (RAB24, Old English Sheepdog and Gordon Setter Variant) | Clear |
| <input checked="" type="checkbox"/> Hereditary Cataracts (HSF4 Exon 9, Australian Shepherd Variant) | Clear |
| <input checked="" type="checkbox"/> Hereditary Cataracts (FYCO1, Wirehaired Pointing Griffon Variant) | Clear |
| <input checked="" type="checkbox"/> Hereditary Cerebellar Ataxia (SELENOP, Belgian Shepherd Variant) | Clear |
| <input checked="" type="checkbox"/> Hereditary Footpad Hyperkeratosis (FAM83G, Terrier and Kromfohrlander Variant) | Clear |
| <input checked="" type="checkbox"/> Hereditary Footpad Hyperkeratosis (DSG1, Rottweiler Variant) | Clear |
| <input checked="" type="checkbox"/> Hereditary Nasal Parakeratosis (SUV39H2 Intron 4, Greyhound Variant) | Clear |
| <input checked="" type="checkbox"/> Hereditary Vitamin D-Resistant Rickets (VDR) | Clear |
| <input checked="" type="checkbox"/> Hypocatalasia, Acatlasemia (CAT) | Clear |
| <input checked="" type="checkbox"/> Hypomyelination and Tremors (FNIP2, Weimaraner Variant) | Clear |
| <input checked="" type="checkbox"/> Hypophosphatasia (ALPL Exon 9, Karelian Bear Dog Variant) | Clear |
| <input checked="" type="checkbox"/> Ichthyosis (NIPAL4, American Bulldog Variant) | Clear |
| <input checked="" type="checkbox"/> Ichthyosis (ASPRV1 Exon 2, German Shepherd Variant) | Clear |
| <input checked="" type="checkbox"/> Ichthyosis (SLC27A4, Great Dane Variant) | Clear |
| <input checked="" type="checkbox"/> Ichthyosis, Epidermolytic Hyperkeratosis (KRT10, Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Ichthyosis, ICH1 (PNPLA1, Golden Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Ichthyosis, ICH2 (ABHD5, Golden Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Inflammatory Myopathy (SLC25A12) | Clear |



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

| | |
|--|-------|
| <input checked="" type="checkbox"/> Inherited Myopathy of Great Danes (BIN1) | Clear |
| <input checked="" type="checkbox"/> Inherited Selected Cobalamin Malabsorption with Proteinuria (CUBN, Komondor Variant) | Clear |
| <input checked="" type="checkbox"/> Intestinal Lipid Malabsorption (ACSL5, Australian Kelpie) | Clear |
| <input checked="" type="checkbox"/> Junctional Epidermolysis Bullosa (LAMA3 Exon 66, Australian Cattle Dog Variant) | Clear |
| <input checked="" type="checkbox"/> Junctional Epidermolysis Bullosa (LAMB3 Exon 11, Australian Shepherd Variant) | Clear |
| <input checked="" type="checkbox"/> Juvenile Epilepsy (LGI2) | Clear |
| <input checked="" type="checkbox"/> Juvenile Laryngeal Paralysis and Polyneuropathy (RAB3GAP1, Rottweiler Variant) | Clear |
| <input checked="" type="checkbox"/> Juvenile Myoclonic Epilepsy (DIRAS1) | Clear |
| <input checked="" type="checkbox"/> L-2-Hydroxyglutaricaciduria, L2HGA (L2HGDH, Staffordshire Bull Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Lagotto Storage Disease (ATG4D) | Clear |
| <input checked="" type="checkbox"/> Laryngeal Paralysis (RAPGEF6, Miniature Bull Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Late Onset Spinocerebellar Ataxia (CAPN1) | Clear |
| <input checked="" type="checkbox"/> Late-Onset Neuronal Ceroid Lipofuscinosis, NCL 12 (ATP13A2, Australian Cattle Dog Variant) | Clear |
| <input checked="" type="checkbox"/> Leonberger Polyneuropathy 1 (LPN1, ARHGEF10) | Clear |
| <input checked="" type="checkbox"/> Leonberger Polyneuropathy 2 (GJA9) | Clear |
| <input checked="" type="checkbox"/> Lethal Acrodermatitis, LAD (MKLN1) | Clear |
| <input checked="" type="checkbox"/> Leukodystrophy (TSEN54 Exon 5, Standard Schnauzer Variant) | Clear |
| <input checked="" type="checkbox"/> Ligneous Membranitis, LM (PLG) | Clear |



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

| | |
|---|-------|
| <input checked="" type="checkbox"/> Limb Girdle Muscular Dystrophy (SGCD, Boston Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Limb-Girdle Muscular Dystrophy 2D (SGCA Exon 3, Miniature Dachshund Variant) | Clear |
| <input checked="" type="checkbox"/> Long QT Syndrome (KCNQ1) | Clear |
| <input checked="" type="checkbox"/> Lundehund Syndrome (LEPREL1) | Clear |
| <input checked="" type="checkbox"/> Malignant Hyperthermia (RYR1) | Clear |
| <input checked="" type="checkbox"/> May-Hegglin Anomaly (MYH9) | Clear |
| <input checked="" type="checkbox"/> MDR1 Drug Sensitivity (ABCB1) | Clear |
| <input checked="" type="checkbox"/> Medium-Chain Acyl-CoA Dehydrogenase Deficiency, MCADD (ACADM, Cavalier King Charles Spaniel Variant) | Clear |
| <input checked="" type="checkbox"/> Methemoglobinemia (CYB5R3, Pit Bull Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Methemoglobinemia (CYB5R3) | Clear |
| <input checked="" type="checkbox"/> Microphthalmia (RBP4 Exon 2, Soft Coated Wheaten Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Mucopolysaccharidosis IIIB, Sanfilippo Syndrome Type B, MPS IIIB (NAGLU, Schipperke Variant) | Clear |
| <input checked="" type="checkbox"/> Mucopolysaccharidosis Type IIIA, Sanfilippo Syndrome Type A, MPS IIIA (SGSH Exon 6, Dachshund Variant) | Clear |
| <input checked="" type="checkbox"/> Mucopolysaccharidosis Type IIIA, Sanfilippo Syndrome Type A, MPS IIIA (SGSH Exon 6, New Zealand Huntaway Variant) | Clear |
| <input checked="" type="checkbox"/> Mucopolysaccharidosis Type VI, Maroteaux-Lamy Syndrome, MPS VI (ARSB Exon 5, Miniature Pinscher Variant) | Clear |
| <input checked="" type="checkbox"/> Mucopolysaccharidosis Type VII, Sly Syndrome, MPS VII (GUSB Exon 3, German Shepherd Variant) | Clear |
| <input checked="" type="checkbox"/> Mucopolysaccharidosis Type VII, Sly Syndrome, MPS VII (GUSB Exon 5, Terrier Brasileiro Variant) | Clear |
| <input checked="" type="checkbox"/> Muscular Dystrophy (DMD, Cavalier King Charles Spaniel Variant 1) | Clear |



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

| | |
|--|-------|
| <input checked="" type="checkbox"/> Muscular Dystrophy (DMD, Golden Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Musladin-Lueke Syndrome, MLS (ADAMTSL2) | Clear |
| <input checked="" type="checkbox"/> Myasthenia Gravis-Like Syndrome (CHRNE, Heideterrier Variant) | Clear |
| <input checked="" type="checkbox"/> Myotonia Congenita (CLCN1 Exon 23, Australian Cattle Dog Variant) | Clear |
| <input checked="" type="checkbox"/> Myotonia Congenita (CLCN1 Exon 7, Miniature Schnauzer Variant) | Clear |
| <input checked="" type="checkbox"/> Narcolepsy (HCRTR2 Exon 1, Dachshund Variant) | Clear |
| <input checked="" type="checkbox"/> Narcolepsy (HCRTR2 Intron 4, Doberman Pinscher Variant) | Clear |
| <input checked="" type="checkbox"/> Nemaline Myopathy (NEB, American Bulldog Variant) | Clear |
| <input checked="" type="checkbox"/> Neonatal Cerebellar Cortical Degeneration (SPTBN2, Beagle Variant) | Clear |
| <input checked="" type="checkbox"/> Neonatal Interstitial Lung Disease (LAMP3) | Clear |
| <input checked="" type="checkbox"/> Neuroaxonal Dystrophy, NAD (VPS11, Rottweiler Variant) | Clear |
| <input checked="" type="checkbox"/> Neuroaxonal Dystrophy, NAD (TECPR2, Spanish Water Dog Variant) | Clear |
| <input checked="" type="checkbox"/> Neuronal Ceroid Lipofuscinosis 1, NCL 1 (PPT1 Exon 8, Dachshund Variant 1) | Clear |
| <input checked="" type="checkbox"/> Neuronal Ceroid Lipofuscinosis 10, NCL 10 (CTSD Exon 5, American Bulldog Variant) | Clear |
| <input checked="" type="checkbox"/> Neuronal Ceroid Lipofuscinosis 2, NCL 2 (TPP1 Exon 4, Dachshund Variant 2) | Clear |
| <input checked="" type="checkbox"/> Neuronal Ceroid Lipofuscinosis 5, NCL 5 (CLN5 Exon 4 SNP, Border Collie Variant) | Clear |
| <input checked="" type="checkbox"/> Neuronal Ceroid Lipofuscinosis 5, NCL 5 (CLN5 Exon 4 Deletion, Golden Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Neuronal Ceroid Lipofuscinosis 6, NCL 6 (CLN6 Exon 7, Australian Shepherd Variant) | Clear |



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

| | |
|--|-------|
| <input checked="" type="checkbox"/> Neuronal Ceroid Lipofuscinosis 7, NCL 7 (MFSD8, Chihuahua and Chinese Crested Variant) | Clear |
| <input checked="" type="checkbox"/> Neuronal Ceroid Lipofuscinosis 8, NCL 8 (CLN8, Australian Shepherd Variant) | Clear |
| <input checked="" type="checkbox"/> Neuronal Ceroid Lipofuscinosis 8, NCL 8 (CLN8 Exon 2, English Setter Variant) | Clear |
| <input checked="" type="checkbox"/> Neuronal Ceroid Lipofuscinosis 8, NCL 8 (CLN8 Insertion, Saluki Variant) | Clear |
| <input checked="" type="checkbox"/> Neuronal Ceroid Lipofuscinosis, Cerebellar Ataxia, NCL4A (ARSG Exon 2, American Staffordshire Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Oculocutaneous Albinism, OCA (SLC45A2 Exon 6, Bullmastiff Variant) | Clear |
| <input checked="" type="checkbox"/> Oculocutaneous Albinism, OCA (SLC45A2, Small Breed Variant) | Clear |
| <input checked="" type="checkbox"/> Oculoskeletal Dysplasia 2 (COL9A2, Samoyed Variant) | Clear |
| <input checked="" type="checkbox"/> Osteogenesis Imperfecta (COL1A2, Beagle Variant) | Clear |
| <input checked="" type="checkbox"/> Osteogenesis Imperfecta (SERPINH1, Dachshund Variant) | Clear |
| <input checked="" type="checkbox"/> Osteogenesis Imperfecta (COL1A1, Golden Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> P2Y12 Receptor Platelet Disorder (P2Y12) | Clear |
| <input checked="" type="checkbox"/> Pachyonychia Congenita (KRT16, Dogue de Bordeaux Variant) | Clear |
| <input checked="" type="checkbox"/> Paroxysmal Dyskinesia, PxD (PIGN) | Clear |
| <input checked="" type="checkbox"/> Persistent Mullerian Duct Syndrome, PMDS (AMHR2) | Clear |
| <input checked="" type="checkbox"/> Pituitary Dwarfism (POU1F1 Intron 4, Karelian Bear Dog Variant) | Clear |
| <input checked="" type="checkbox"/> Platelet Factor X Receptor Deficiency, Scott Syndrome (TMEM16F) | Clear |
| <input checked="" type="checkbox"/> Polycystic Kidney Disease, PKD (PKD1) | Clear |



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

| | |
|---|-------|
| <input checked="" type="checkbox"/> Pompe's Disease (GAA, Finnish and Swedish Lapphund, Lapponian Herder Variant) | Clear |
| <input checked="" type="checkbox"/> Prekallikrein Deficiency (KLKB1 Exon 8) | Clear |
| <input checked="" type="checkbox"/> Primary Ciliary Dyskinesia, PCD (NME5, Alaskan Malamute Variant) | Clear |
| <input checked="" type="checkbox"/> Primary Ciliary Dyskinesia, PCD (STK36, Australian Shepherd Variant) | Clear |
| <input checked="" type="checkbox"/> Primary Ciliary Dyskinesia, PCD (CCDC39 Exon 3, Old English Sheepdog Variant) | Clear |
| <input checked="" type="checkbox"/> Primary Hyperoxaluria (AGXT) | Clear |
| <input checked="" type="checkbox"/> Primary Lens Luxation (ADAMTS17) | Clear |
| <input checked="" type="checkbox"/> Primary Open Angle Glaucoma (ADAMTS17 Exon 11, Basset Fauve de Bretagne Variant) | Clear |
| <input checked="" type="checkbox"/> Primary Open Angle Glaucoma (ADAMTS10 Exon 17, Beagle Variant) | Clear |
| <input checked="" type="checkbox"/> Primary Open Angle Glaucoma (ADAMTS10 Exon 9, Norwegian Elkhound Variant) | Clear |
| <input checked="" type="checkbox"/> Primary Open Angle Glaucoma and Primary Lens Luxation (ADAMTS17 Exon 2, Chinese Shar-Pei Variant) | Clear |
| <input checked="" type="checkbox"/> Progressive Retinal Atrophy (SAG) | Clear |
| <input checked="" type="checkbox"/> Progressive Retinal Atrophy (IFT122 Exon 26, Lapponian Herder Variant) | Clear |
| <input checked="" type="checkbox"/> Progressive Retinal Atrophy 5, PRA5 (NECAP1 Exon 6, Giant Schnauzer Variant) | Clear |
| <input checked="" type="checkbox"/> Progressive Retinal Atrophy, Bardet-Biedl Syndrome (BBS2 Exon 11, Shetland Sheepdog Variant) | Clear |
| <input checked="" type="checkbox"/> Progressive Retinal Atrophy, CNGA (CNGA1 Exon 9) | Clear |
| <input checked="" type="checkbox"/> Progressive Retinal Atrophy, crd1 (PDE6B, American Staffordshire Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Progressive Retinal Atrophy, PRA1 (CNGB1) | Clear |



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

| | |
|--|-------|
| <input checked="" type="checkbox"/> Progressive Retinal Atrophy, PRA3 (FAM161A) | Clear |
| <input checked="" type="checkbox"/> Progressive Retinal Atrophy, rcd1 (PDE6B Exon 21, Irish Setter Variant) | Clear |
| <input checked="" type="checkbox"/> Progressive Retinal Atrophy, rcd3 (PDE6A) | Clear |
| <input checked="" type="checkbox"/> Proportionate Dwarfism (GH1 Exon 5, Chihuahua Variant) | Clear |
| <input checked="" type="checkbox"/> Protein Losing Nephropathy, PLN (NPHS1) | Clear |
| <input checked="" type="checkbox"/> Pyruvate Dehydrogenase Deficiency (PDP1, Spaniel Variant) | Clear |
| <input checked="" type="checkbox"/> Pyruvate Kinase Deficiency (PKLR Exon 5, Basenji Variant) | Clear |
| <input checked="" type="checkbox"/> Pyruvate Kinase Deficiency (PKLR Exon 7, Beagle Variant) | Clear |
| <input checked="" type="checkbox"/> Pyruvate Kinase Deficiency (PKLR Exon 10, Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Pyruvate Kinase Deficiency (PKLR Exon 7, Pug Variant) | Clear |
| <input checked="" type="checkbox"/> Raine Syndrome (FAM20C) | Clear |
| <input checked="" type="checkbox"/> Recurrent Inflammatory Pulmonary Disease, RIPD (AKNA, Rough Collie Variant) | Clear |
| <input checked="" type="checkbox"/> Renal Cystadenocarcinoma and Nodular Dermatofibrosis (FLCN Exon 7) | Clear |
| <input checked="" type="checkbox"/> Retina Dysplasia and/or Optic Nerve Hypoplasia (SIX6 Exon 1, Golden Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Sensory Neuropathy (FAM134B, Border Collie Variant) | Clear |
| <input checked="" type="checkbox"/> Severe Combined Immunodeficiency, SCID (PRKDC, Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Severe Combined Immunodeficiency, SCID (RAG1, Wetterhoun Variant) | Clear |
| <input checked="" type="checkbox"/> Shaking Puppy Syndrome (PLP1, English Springer Spaniel Variant) | Clear |



"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

| | |
|--|-------|
| <input checked="" type="checkbox"/> Shar-Pei Autoinflammatory Disease, SPAID, Shar-Pei Fever (MTBP) | Clear |
| <input checked="" type="checkbox"/> Skin Fragility Syndrome (PKP1, Chesapeake Bay Retriever Variant) | Clear |
| <input checked="" type="checkbox"/> Spinocerebellar Ataxia (SCN8A, Alpine Dachsbracke Variant) | Clear |
| <input checked="" type="checkbox"/> Spinocerebellar Ataxia with Myokymia and/or Seizures (KCNJ10) | Clear |
| <input checked="" type="checkbox"/> Spongy Degeneration with Cerebellar Ataxia 1 (KCNJ10) | Clear |
| <input checked="" type="checkbox"/> Spongy Degeneration with Cerebellar Ataxia 2 (ATP1B2) | Clear |
| <input checked="" type="checkbox"/> Succinic Semialdehyde Dehydrogenase Deficiency (ALDH5A1 Exon 7, Saluki Variant) | Clear |
| <input checked="" type="checkbox"/> Thrombopathia (RASGRP1 Exon 5, American Eskimo Dog Variant) | Clear |
| <input checked="" type="checkbox"/> Thrombopathia (RASGRP1 Exon 5, Basset Hound Variant) | Clear |
| <input checked="" type="checkbox"/> Thrombopathia (RASGRP1 Exon 8, Landseer Variant) | Clear |
| <input checked="" type="checkbox"/> Trapped Neutrophil Syndrome, TNS (VPS13B) | Clear |
| <input checked="" type="checkbox"/> Ullrich-like Congenital Muscular Dystrophy (COL6A1 Exon 3, Landseer Variant) | Clear |
| <input checked="" type="checkbox"/> Unilateral Deafness and Vestibular Syndrome (PTPRQ Exon 39, Doberman Pinscher) | Clear |
| <input checked="" type="checkbox"/> Von Willebrand Disease Type II, Type II vWD (VWF, Pointer Variant) | Clear |
| <input checked="" type="checkbox"/> Von Willebrand Disease Type III, Type III vWD (VWF Exon 4, Terrier Variant) | Clear |
| <input checked="" type="checkbox"/> Von Willebrand Disease Type III, Type III vWD (VWF Intron 16, Nederlandse Kooikerhondje Variant) | Clear |
| <input checked="" type="checkbox"/> Von Willebrand Disease Type III, Type III vWD (VWF Exon 7, Shetland Sheepdog Variant) | Clear |
| <input checked="" type="checkbox"/> X-Linked Hereditary Nephropathy, XLHN (COL4A5 Exon 35, Samoyed Variant 2) | Clear |





"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

OTHER RESULTS

- X-Linked Progressive Retinal Atrophy 1, XL-PRA1 (RPGR) Clear
- 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





"MURPHY"

MOONLIT ACRES MURPHY'S LAW



DNA Test Report

Test Date: December 15th, 2025

embk.me/rolo521

INBREEDING AND DIVERSITY

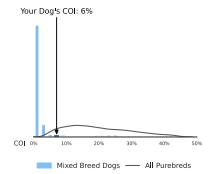
CATEGORY

RESULT

Coefficient Of Inbreeding

Our genetic COI measures the proportion of your dog's genome where the genes on the mother's side are identical by descent to those on the father's side.

6%

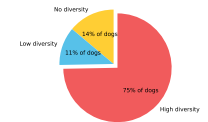


MHC Class II - DLA DRB1

A Dog Leukocyte Antigen (DLA) gene, DRB1 encodes a major histocompatibility complex (MHC) protein involved in the immune response. Some studies have shown associations between certain DRB1 haplotypes and autoimmune diseases such as Addison's disease (hypoadrenocorticism) in certain dog breeds, but these findings have yet to be scientifically validated.

High Diversity

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



MHC Class II - DLA DQA1 and DQB1

DQA1 and DQB1 are two tightly linked DLA genes that code for MHC proteins involved in the immune response. 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:

