



**CHICA**



DNA Test Report

Test Date: May 5th, 2025

[embk.me/chica509](https://embk.me/chica509)

## BREED ANCESTRY

 Golden Retriever : 100.0%

## GENETIC STATS

Predicted adult weight: **59 lbs**

## TEST DETAILS

Kit number: EM-15559044

Swab number: 31240510601021



## GOLDEN RETRIEVER



### 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).

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 Chica'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: 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 hairs  
anywhere (ee)**

Dogs with one or two copies of the **E<sup>m</sup>** variant may have a melanistic mask (dark facial hair as commonly seen in the German Shepherd Dog and Pug). In the absence of **E<sup>m</sup>**, dogs with the **E<sup>g</sup>** 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<sup>m</sup>** and **E** variants, dogs with the **E<sup>a</sup>** or **E<sup>h</sup>** variants can express the grizzle phenotype. Additionally, a dog with any combination of two of the **E<sup>g</sup>**, **E<sup>a</sup>**, or **E<sup>h</sup>** variants (example: **E<sup>g</sup>E<sup>a</sup>**) is also expected to express the grizzle phenotype.

### K Locus (CBD103)

The K Locus **K<sup>B</sup>** allele "overrides" the A Locus, meaning that it prevents the A Locus genotype from affecting coat color. For this reason, the **K<sup>B</sup>** allele is referred to as the "dominant black" allele. As a result, dogs with at least one **K<sup>B</sup>** 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<sup>Y</sup>k<sup>Y</sup>** genotype will show a coat color pattern based on the genotype they have at the A Locus. Dogs who test as **K<sup>B</sup>k<sup>Y</sup>** may be brindle rather than black or brown.

**Not expressed (K<sup>B</sup>K<sup>B</sup>)**



## TRAITS: COAT COLOR (CONTINUED)

|              |               |
|--------------|---------------|
| <b>TRAIT</b> | <b>RESULT</b> |
|--------------|---------------|

### 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 pigmented hair likely yellow or tan (Intermediate 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<sup>Y</sup>k<sup>Y</sup>** 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.

**Not expressed (a<sup>t</sup>a<sup>t</sup>)**

### 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.

**Not expressed (DD)**



## 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".

**Likely black colored nose/feet (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<sup>t</sup>** allele, so dogs that do not express **a<sup>t</sup>** are not influenced by this gene.

**Not expressed (NI)**

### 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 to have little to no white in coat (SS)**



## TRAITS: COAT COLOR (CONTINUED)

|              |               |
|--------------|---------------|
| <b>TRAIT</b> | <b>RESULT</b> |
|--------------|---------------|

### 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 ticked, and not obviously roan. The roan pattern can appear with or without ticking.

**Likely no impact on coat pattern (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)**



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## 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)**



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## TRAITS: OTHER COAT TRAITS

| TRAIT  | RESULT   |
|--|--|
| <b>Furnishings (RSPO2)</b>   |  |
| <p>Dogs with one or two copies of the <b>F</b> allele have “furnishings”: the mustache, beard, and eyebrows characteristic of breeds like the Schnauzer, Scottish Terrier, and Wire Haired Dachshund. A dog with two <b>I</b> 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.</p> | <b>Likely unfurnished (no mustache, beard, and/or eyebrows) (II)</b> |



## TRAITS: OTHER COAT TRAITS (CONTINUED)

|              |               |
|--------------|---------------|
| <b>TRAIT</b> | <b>RESULT</b> |
|--------------|---------------|

### 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.



## 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 RSP02 (the furnishings gene) tend to be low shedders regardless of their genotype at this gene.

**Likely light shedding (TT)**

### 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 (RSP02) 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 straight coat (CC)**

### 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)**



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## 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)**



## 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)**



## TRAITS: OTHER BODY FEATURES (CONTINUED)

|              |               |
|--------------|---------------|
| <b>TRAIT</b> | <b>RESULT</b> |
|--------------|---------------|

### 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)**



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## TRAITS: BODY SIZE

| TRAIT   | RESULT             |
|---|--------------------|
| <p><b>Body Size (IGF1)</b></p> <p>The I allele is associated with smaller body size.</p>        | <b>Larger (NN)</b> |
| <p><b>Body Size (IGFR1)</b></p> <p>The A allele is associated with smaller body size.</p>       | <b>Larger (GG)</b> |
| <p><b>Body Size (STC2)</b></p> <p>The A allele is associated with smaller body size.</p>        | <b>Larger (TT)</b> |
| <p><b>Body Size (GHR - E191K)</b></p> <p>The A allele is associated with smaller body size.</p> | <b>Larger (GG)</b> |
| <p><b>Body Size (GHR - P177L)</b></p> <p>The T allele is associated with smaller body size.</p> | <b>Larger (CC)</b> |



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## 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)**



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## HEALTH REPORT

### How to interpret Chica's genetic health results:

If Chica 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 Chica 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 5 results that you should learn about.

#### Notable results (5)

ALT Activity

Copper Toxicosis (Accumulating)

Copper Toxicosis (Attenuating)

Copper Toxicosis (Attenuating)

Ichthyosis, ICH1

#### Clear results

Breed-relevant (11)

Other (257)



## BREED-RELEVANT RESULTS

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

|  |         |
|--|---------|
| Ichthyosis, ICH1 (PNPLA1, Golden Retriever Variant)                                      | Notable |
| Congenital Myasthenic Syndrome, CMS (COLQ, Golden Retriever Variant)                     | Clear   |
| Degenerative Myelopathy, DM (SOD1A)  | Clear   |
| Dystrophic Epidermolysis Bullosa (COL7A1, Golden Retriever Variant)                      | Clear   |
| Golden Retriever Progressive Retinal Atrophy 1, GR-PRA1 (SLC4A3)                         | Clear   |
| Golden Retriever Progressive Retinal Atrophy 2, GR-PRA2 (TTC8)                           | Clear   |
| Ichthyosis, ICH2 (ABHD5, Golden Retriever Variant)                                       | Clear   |
| Muscular Dystrophy (DMD, Golden Retriever Variant)                                       | Clear   |
| Neuronal Ceroid Lipofuscinosis 5, NCL 5 (CLN5 Exon 4 Deletion, Golden Retriever 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   |



## OTHER RESULTS

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

|   |         |
|---|---------|
| ⊖ ALT Activity (GPT)  | Notable |
| ⊖ Copper Toxicosis (Accumulating) (ATP7B)   | Notable |
| ⊖ Copper Toxicosis (Attenuating) (ATP7A, Labrador Retriever)                                | Notable |
| ⊖ Copper Toxicosis (Attenuating) (RETN, 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   |



## OTHER RESULTS

|  |       |
|--|-------|
| <input checked="" type="checkbox"/> Canine Multifocal Retinopathy, cmr1 (BEST1 Exon 2)   | Clear |
| <input checked="" type="checkbox"/> Canine Multifocal Retinopathy, cmr2 (BEST1 Exon 5, Coton de Tulear Variant)  | Clear |
| <input checked="" type="checkbox"/> Canine Multifocal Retinopathy, cmr3 (BEST1 Exon 10 Deletion, Finnish and Swedish Lapphund, Lapponian Herder Variant) | Clear |
| <input checked="" type="checkbox"/> Canine Multiple System Degeneration (SERAC1 Exon 4, Chinese Crested Variant)   | Clear |
| <input checked="" type="checkbox"/> Canine Multiple System Degeneration (SERAC1 Exon 15, Kerry Blue Terrier Variant)                                     | Clear |
| <input checked="" type="checkbox"/> Cardiomyopathy and Juvenile Mortality (YARS2)  | Clear |
| <input checked="" type="checkbox"/> Centronuclear Myopathy, CNM (PTPLA)  | Clear |
| <input checked="" type="checkbox"/> Cerebellar Hypoplasia (VLDLR, Eurasier Variant)  | Clear |
| <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 Dyserythropoietic Anemia and Polymyopathy (EHPB1L1, Labrador Retriever Variant)                           | Clear |
| <input checked="" type="checkbox"/> Congenital Hypothyroidism (TPO, Rat, Toy, Hairless Terrier Variant)  | Clear |



## OTHER RESULTS

|  |       |
|--|-------|
| <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, Labrador 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 |
| <input checked="" type="checkbox"/> Congenital Stationary Night Blindness (RPE65, Briard Variant)                      | 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 |



# CHICA



DNA Test Report

Test Date: May 5th, 2025

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## OTHER RESULTS

|  |       |
|--|-------|
| <input checked="" type="checkbox"/> Day Blindness (CNGA3 Exon 7, Labrador Retriever 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 |
| <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"/> 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"/> Ehlers-Danlos Syndrome (EDS) (COL5A1, Labrador Retriever Variant)                              | Clear |
| <input checked="" type="checkbox"/> Enamel Hypoplasia (ENAM Deletion, Italian Greyhound Variant)                                   | Clear |



## OTHER RESULTS

|  |       |
|--|-------|
| <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"/> Exercise-Induced Collapse, EIC (DNM1)  | 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 3, Cocker Spaniel 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 |
| <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, Whippet and English Springer Spaniel 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 |



## OTHER RESULTS

|  |       |
|--|-------|
| <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"/> GM2 Gangliosidosis (HEXB, Poodle Variant)  | 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 |
| <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 |



## OTHER RESULTS

|  |       |
|--|-------|
| <input checked="" type="checkbox"/> Hereditary Nasal Parakeratosis, HNPk (SUV39H2)                                       | 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"/> Inflammatory Myopathy (SLC25A12)   | Clear |
| <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"/> Intervertebral Disc Disease (Type I) (FGF4 retrogene - CFA12)                        | 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 |



## OTHER RESULTS

|   |       |
|---|-------|
| <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"/> Laryngeal Paralysis and Polyneuropathy (CNTNAP1, Leonberger, Saint Bernard, and Labrador Retriever 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 |
| <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"/> Macular Corneal Dystrophy, MCD (CHST6)  | Clear |
| <input checked="" type="checkbox"/> Malignant Hyperthermia (RYR1)   | Clear |



## OTHER RESULTS

|   |       |
|---|-------|
| ✔ May-Hegglin Anomaly (MYH9)  | Clear |
| ✔ MDR1 Drug Sensitivity (ABCB1)   | Clear |
| ✔ 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 |



## OTHER RESULTS

|  |       |
|--|-------|
| <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"/> Narcolepsy (HCRTR2 Intron 6, Labrador Retriever 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 Encephalopathy with Seizures, NEWS (ATF2)                                     | 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 6, NCL 6 (CLN6 Exon 7, Australian Shepherd Variant)     | Clear |
| <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 |



## OTHER RESULTS

|  |       |
|--|-------|
| <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"/> Osteochondrodysplasia (SLC13A1, Poodle 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"/> 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 |
| <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 |



## OTHER RESULTS

|   |       |
|---|-------|
| <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, crd4/cord1 (RPGRIP1)   | Clear |
| <input checked="" type="checkbox"/> Progressive Retinal Atrophy, PRA1 (CNGB1)   | Clear |
| <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 |



# CHICA



DNA Test Report

Test Date: May 5th, 2025

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## OTHER RESULTS

|   |       |
|---|-------|
| <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, Labrador Retriever 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"/> 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 |
| <input checked="" type="checkbox"/> Shar-Pei Autoinflammatory Disease, SPAID, Shar-Pei Fever (MTBP)             | Clear |
| <input checked="" type="checkbox"/> Skeletal Dysplasia 2, SD2 (COL11A2, Labrador Retriever Variant)             | Clear |



## OTHER RESULTS

|   |       |
|---|-------|
| <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"/> Stargardt Disease (ABCA4 Exon 28, Labrador Retriever Variant)                           | 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 (COL6A3 Exon 10, Labrador Retriever Variant) | 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"/> Urate Kidney & Bladder Stones (SLC2A9)  | Clear |
| <input checked="" type="checkbox"/> Von Willebrand Disease Type I, Type I vWD (VWF)   | 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 |



CHICA



DNA Test Report

Test Date: May 5th, 2025

embk.me/chica509

## OTHER RESULTS

|  |           |
|--|-----------|
| <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     |
| <input checked="" type="checkbox"/> X-Linked Myotubular Myopathy (MTM1, Labrador Retriever Variant)                                  | Clear     |
| <input checked="" type="checkbox"/> X-Linked Progressive Retinal Atrophy 1, XL-PRA1 (RPGR)   | Clear     |
| <input checked="" type="checkbox"/> X-linked Severe Combined Immunodeficiency, X-SCID (IL2RG Exon 1, Basset Hound Variant)           | Clear     |
| <input checked="" type="checkbox"/> X-linked Severe Combined Immunodeficiency, X-SCID (IL2RG, Corgi Variant)                         | Clear     |
| <input checked="" type="checkbox"/> Xanthine Urolithiasis (XDH, Mixed Breed Variant)   | Clear     |
| <input checked="" type="checkbox"/> $\beta$ -Mannosidosis (MANBA Exon 16, Mixed-Breed Variant)                                       | Clear     |
| Mast Cell Tumor  | No result |





# CHICA



DNA Test Report

Test Date: May 5th, 2025

[embk.me/chica509](https://embk.me/chica509)

## HEALTH REPORT

### Notable result

#### ALT Activity

Chica inherited one copy of the variant we tested for Alanine Aminotransferase Activity

#### Why is this important to your vet?

Chica has one copy of a variant associated with reduced ALT activity as measured on veterinary blood chemistry panels. Please inform your veterinarian that Chica has this genotype, as ALT is often used as an indicator of liver health and Chica is likely to have a lower than average resting ALT activity. As such, an increase in Chica's 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 (Accumulating)**

Chica inherited one copy of the variant we tested for Copper Toxicosis (Accumulating)

Chica is not known to be at increased risk for Copper Toxicosis (Accumulating)

#### **What does this result mean?**

We do not know whether this increases the risk that Chica will develop Copper Toxicosis (Accumulating).

#### **Scientific Basis**

Research studies for this variant have been based on dogs of other breeds. Not enough dogs with Chica's breed have been studied to know whether or not this variant will increase Chica's risk of developing this disease.

#### **Impact on Breeding**

Research into the clinical impact of this variant is ongoing. We recommend tracking this genetic result and incidence of Copper Toxicosis (Accumulating) in your breeding program and related dogs.

#### **What is Copper Toxicosis (Accumulating)?**

Copper toxicosis is a condition in which affected dogs have difficulty excreting excess copper from their liver. The liver accumulates more copper until it eventually begins failing. Multiple genetic and environmental factors contribute to the development of this condition.

#### **When signs & symptoms develop in affected dogs**

Signs typically develop in adults.

#### **How vets diagnose this condition**

Genetic testing, blood work, abdominal ultrasound, and surgical biopsy are all used to diagnose this condition.

#### **How this condition is treated**

Treatment includes a low copper diet and medical management to help bind excess copper. Antioxidant supplements may also be considered.

#### **Actions to take if your dog is affected**

- Please consult your veterinarian for dietary advice and follow their recommendations for monitoring.
- Learn more about how the three variants for Copper Toxicosis are inherited and, if applicable, how results can be used in a breeding program here (<https://embarkvet.com/resources/embark-adds-copper-toxicosis-dna-test/>)



## HEALTH REPORT

### Notable result

#### **Copper Toxicosis (Attenuating)**

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

#### **Why is this important to your vet?**

Chica 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=47>). 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=47>). 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=47>) 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=47>) 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=47>) 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=47>) variant, please read what actions you can take on the ATP7B page.



## HEALTH REPORT

### Notable result

#### **Copper Toxicosis (Attenuating)**

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

#### **Why is this important to your vet?**

Chica has a genotype at the RETN 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=47>). This variant is not associated with an increased risk of any disease.

#### **What is Copper Toxicosis (Attenuating)?**

The RETN 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=47>). The RETN variant may help mitigate some of the symptoms of dogs with variants at ATP7B. Dogs with the RETN 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 not affect the onset of clinical signs of copper toxicosis in dogs with the ATP7B (<https://my.embarkvet.com/members/results/health/condition/140102?i=47>) 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=47>) 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=47>) 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=47>) variant, please read what actions you can take on the ATP7B page.



## HEALTH REPORT

### Notable result

#### Ichthyosis, ICH1

Chica inherited one copy of the variant we tested for Ichthyosis, ICH1

#### What does this result mean?

This variant should not impact Chica's health. This variant is inherited in an autosomal recessive manner, meaning that a dog needs two copies of the variant to show signs of this condition. Chica is unlikely to develop this condition due to this variant because she only has one copy of the variant.

#### Impact on Breeding

Your dog carries this variant and will pass it on to ~50% of her offspring. You can email [breeders@embarkvet.com](mailto:breeders@embarkvet.com) to discuss with a genetic counselor how the genotype results should be applied to a breeding program.

#### What is Ichthyosis, ICH1?

This skin disorder gets its name from the thick, darkly pigmented scales of skin ("ichthys" is Greek for "fish") that affected dogs display over most areas of the body, not including the head or extremities.

#### When signs & symptoms develop in affected dogs

As puppies, affected dogs can show signs of scaling. This disease tends to worsen with age.

#### How vets diagnose this condition

Examining the characteristic lesions is the first step in diagnosing Ichthyosis. Confirmatory genetic testing and/or skin biopsies can also be performed.

#### How this condition is treated

There is no definitive treatment for ichthyosis: typically, ichthyotic dogs are maintained on a continuous treatment of mild anti-dandruff shampoos and moisturizing rinses. This is a chronic and frustrating condition to manage.

#### Actions to take if your dog is affected

- Following your veterinarian's advice on skin care and nutrition is the best way to manage ichthyosis.



## INBREEDING AND DIVERSITY

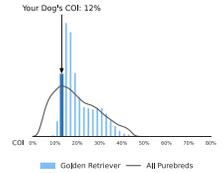
### CATEGORY

### 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.

12%

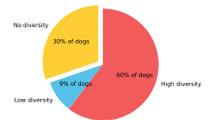


#### MHC Class II - DLA DRB1

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.

#### No Diversity

How common is this amount of diversity in purebreds:



#### 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.

#### Low Diversity

How common is this amount of diversity in purebreds:

