



AMERICAN
KENNEL CLUB®

8051 Arco Corporate Drive
Suite 100
Raleigh, NC 27617-3390
www.akc.org

January 6, 2022

DEAR WILLARD HELMUTH,

Congratulations on your new Poodle and welcome to the world of purebred dogs. Your AKC registration dollars support numerous AKC efforts to benefit dogs and dog owners. By registering your dog with the AKC, you supported valuable programs such as Pet Disaster Relief, the AKC Canine Health Foundation, the AKC Kennel Inspection Program, public education, canine legislation, and DNA parentage verification.

AKC registration provides wonderful opportunities for every purebred dog lover. The AKC Canine Good Citizen® program is an outstanding way to train your dog in basic obedience, valuable for every family. In addition, many dog owners enjoy the thrill of participating in AKC activities, shows and trials throughout the country. I invite you and your dog to get involved with the AKC!

Your registration also includes exclusive health benefits to help keep your new dog safe and healthy. Your dog is eligible for 30 days of pet health insurance included with your registration at no additional cost. This coverage reimburses for veterinary expenses due to unexpected accidents and illnesses. It also includes access to a 24/7 Vet Helpline. Activation of coverage is required in most states. For more information or to activate your policy, visit www.akcpetinsurance.com/certificate or call 866-725-2747.†

Please note, if you ordered multiple items at the time of registration, they will be mailed separately and should arrive shortly. These include the AKC Certified Pedigree, the Dog Care and Training video, *Family Dog* magazine, and the AKC collar tag. If you did not order a Pedigree, you still have the opportunity to do so. An order form is provided on the back of this letter.

All of us want to be responsible dog owners. To help, the AKC offers a wealth of information at www.akc.org. Our site lists national and local dog clubs and AKC Canine Good Citizen® evaluators. Please visit us online and on Facebook and Twitter. If we can be of further service to you, please contact us by phone at 919-233-9767 or by email at info@akc.org.

Sincerely,

Dennis B. Sprung
President and Chief Executive Officer

† Insurance is underwritten and issued by Independence American Insurance Company with offices at 485 Madison Ave, NY, NY 10022, and in WA by American Pet Insurance Company, 6100 4th Ave. S., Seattle, WA 98108. Insurance plans are offered and administered by PetPartners, Inc., a licensed agency. "American Kennel Club," "AKC" and the AKC logo are trademarks of The American Kennel Club, Inc.; used under license by PetPartners. "AKC Pet Insurance" is the name used by PetPartners to offer and administer insurance plans and is neither an American Kennel Club business nor an insurance company. American Kennel Club does not offer, administer, solicit, market or sell any insurance plans. For complete details refer to www.akcpetinsurance.com/sample-policies. Activation required for initial 30 days of coverage to take effect. Eligibility restrictions apply. For more information, visit www.akcpetinsurance.com/akc-offer or call 866-725-2747.

Please separate below and keep for your records.

AMERICAN KENNEL CLUB

NAME
QUINN XVI

NUMBER
PR23960301

BREED
POODLE

SEX
FEMALE

COLOR
RED

DATE OF BIRTH
MARCH 3, 2021

SIRE
SYMPHONY'S YOU GOT SOME SPLANIN TO DO
PR21185701 07-20

DAM
SYMPHONY'S BLACK SATIN PEARL
PR20237002 07-20

BREEDER
TERESA SKAGGS

OWNER

WILLARD HELMUTH
579 N CR 100 E
ARTHUR IL 61911-6265



AMERICAN
KENNEL CLUB®

CERTIFICATE ISSUED
JANUARY 6, 2022

This certificate invalidates all previous certificates issued.

If a date appears after the name and number of the sire and dam, it indicates the issue of the Stud Book Register in which the sire or dam is published.

For Transfer Instructions, see back of Certificate.

This Certificate issued with the right to correct or revoke by the American Kennel Club.

ORTHOPEDIC FOUNDATION FOR ANIMALS, INC.

QUINN XVI
registered name

POODLE
breed

film/test/lab #

900215002436558
tattoo/microchip/DNA profile

2463545
application number

06/06/2023
date of report

RESULTS:

Normal cardiovascular examination via auscultation - No evidence of congenital or acquired heart disease was noted. Since acquired heart disease may develop later, these evaluation results remain valid for one year, and annual examinations are recommended to continue to monitor cardiac health.

PR23960301
registration no.

F
sex

03/03/2021
date of birth

26
age at evaluation in months



A Not-For-Profit Organization

PO-BCA4160/26F/P-VPI
O.F.A. NUMBER

This number issued with the right to correct or revoke by the Orthopedic Foundation for Animals.

NORMAL/CLEAR - PRACTITIONER

owner

WILLARD R. HELMUTH
579 N CR 100 E
ARTHUR IL 61911

OFA eCert



Verify QR scan

G.G. KELLER, D.V.M., M.S., DACVR
CHIEF OF VETERINARY SERVICES

www.ofa.org

This electronic OFA certificate was generated on: 06/06/2023

This certification can be verified on the OFA website by entering the dog's registration number into the orange search box located at the top of the page or by scanning the QR code above.

If there are any errors on this certificate, please email CORRECTIONS@OFFA.ORG to request a correction.

Orthopedic Foundation for Animals, Inc.
2300 E. Nifong Blvd.
Columbia, MO 65201-3806

OFA website: www.ofa.org
E-mail address: ofa@offa.org
Phone number: 573-442-0418
Fax number: 573-875-5073

ORTHOPEDIC FOUNDATION FOR ANIMALS, INC.

QUINN XVI
registered name

POODLE
breed

film/test/lab #

900215002436558
tattoo/microchip/DNA profile

2463545
application number

06/06/2023
date of report

RESULTS:

The results of the examination submitted to OFA indicate that no evidence of patellar luxation was recognized.

owner WILLARD R. HELMUTH
579 N CR 100 E
ARTHUR IL 61911

PR23960301
registration no.

F
sex

03/03/2021
date of birth

26
age at evaluation in months



A Not-For-Profit Organization

PO-PA10188/26F/P-VPI
O.F.A. NUMBER

This number issued with the right to correct or revoke by the Orthopedic Foundation for Animals.

NORMAL - PRACTITIONER

G.G.KELLER, D.V.M., M.S., DACVR
CHIEF OF VETERINARY SERVICES

OFA eCert



Verify QR scan

www.ofa.org

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Phone number: 573-442-0418
Fax number: 573-875-5073

ORTHOPEDIC FOUNDATION FOR ANIMALS, INC.

QUINN XVI
registered name

POODLE
breed

898600
film/test/lab #

900215002436558
tattoo/microchip/DNA profile

2463545
application number

08/23/2023
date of report

RESULTS:

Based upon the exam dated 05/20/2023, this dog has been found to be free of observable inherited eye disease and has been issued an Eye Certification Registry Number which is valid for one year from the time of the exam.

PR23960301
registration no.

F
sex

03/03/2021
date of birth

26
age at evaluation in months



A Not-For-Profit Organization

PO-EYE11315/26F-VPI
O.F.A. NUMBER

This number issued with the right to correct or revoke by the Orthopedic Foundation for Animals.

NORMAL

owner

WILLARD R. HELMUTH
579 N CR 100 E
ARTHUR IL 61911

OFA eCert



Verify QR scan

G.G.KELLER, D.V.M., M.S., DACVR
CHIEF OF VETERINARY SERVICES

www.ofa.org

This electronic OFA certificate was generated on: 08/23/2023

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Phone number: 573-442-0418
Fax number: 573-875-5073

ORTHOPEDIC FOUNDATION FOR ANIMALS, INC.

QUINN XVI
registered name

POODLE
breed

film/test/lab #

900215002436558
tattoo/microchip/DNA profile

2463545
application number

06/09/2023
date of report

RESULTS:

Based upon the radiograph submitted, the consensus was that no evidence of elbow dysplasia was recognized.

owner WILLARD R. HELMUTH
579 N CR 100 E
ARTHUR IL 61911

PR23960301
registration no.

F
sex

03/03/2021
date of birth

26
age at evaluation in months



A Not-For-Profit Organization

PO-EL8505F26-P-VPI
O.F.A. NUMBER

This number issued with the right to correct or revoke by the Orthopedic Foundation for Animals.

NORMAL

OFA eCert



Verify QR scan

G.G.KELLER, D.V.M., M.S., DACVR
CHIEF OF VETERINARY SERVICES

www.ofa.org

This electronic OFA certificate was generated on: 06/09/2023

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E-mail address: ofa@offa.org
Phone number: 573-442-0418
Fax number: 573-875-5073

ORTHOPEDIC FOUNDATION FOR ANIMALS, INC.

QUINN XVI
registered name

PR23960301
registration no.

POODLE
breed

F
sex

film/test/lab #

03/03/2021
date of birth

900215002436558
tattoo/microchip/DNA profile

26
age at evaluation in months

2463545
application number



A Not-For-Profit Organization

06/09/2023
date of report

PO-33255G26F-P-VPI
O.F.A. NUMBER

*This number issued with the right to correct or
revoke by the Orthopedic Foundation for Animals.*

RESULTS:

Based upon the radiograph submitted, the consensus was that no evidence of hip dysplasia was recognized. The hip joint conformation was evaluated as:

GOOD

owner
WILLARD R. HELMUTH
579 N CR 100 E
ARTHUR IL 61911

OFA eCert



Verify QR scan

G.G.KELLER, D.V.M., M.S., DACVR
CHIEF OF VETERINARY SERVICES

www.ofa.org

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Phone number: 573-442-0418
Fax number: 573-875-5073

ORTHOPEDIC FOUNDATION FOR ANIMALS, INC.

QUINN XVI
registered name

POODLE
breed

film/test/lab #

900215002436558
tattoo/microchip/DNA profile

2463545
application number

06/09/2023
date of report

RESULTS:

Based upon the radiograph submitted, no phenotypic evidence of Legg-Calve-Perthes disease was recognized.

PR23960301
registration no.

F
sex

03/03/2021
date of birth

26
age at evaluation in months



A Not-For-Profit Organization

PO-LP2759/26F-VPI
O.F.A. NUMBER

This number issued with the right to correct or revoke by the Orthopedic Foundation for Animals.

NORMAL

owner WILLARD R. HELMUTH
579 N CR 100 E
ARTHUR IL 61911



G.G. KELLER, D.V.M., M.S., DACVR
CHIEF OF VETERINARY SERVICES

www.ofa.org

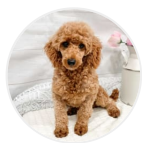
This electronic OFA certificate was generated on: 06/09/2023

This certification can be verified on the OFA website by entering the dog's registration number into the orange search box located at the top of the page or by scanning the QR code above.

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OFA website: www.ofa.org
E-mail address: ofa@offa.org
Phone number: 573-442-0418
Fax number: 573-875-5073



QUINN




DNA Test Report

Test Date: October 25th, 2023

embk.me/quinn1194

BREED ANCESTRY

 Poodle (Small) : 100.0%

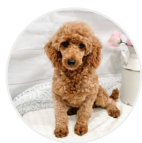
GENETIC STATS

Predicted adult weight: 11 lbs

TEST DETAILS

Kit number: EM-19658116

Swab number: 31220412301726



QUINN



DNA Test Report

Test Date: October 25th, 2023

embk.me/quinn1194

POODLE (SMALL)



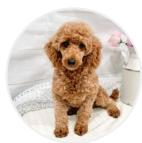
Miniature and toy poodles are varieties of the poodle breed which originated in Germany in the 15th century. Unlike the larger standard poodle (>15 inches tall), these small poodles were not developed for hunting---except for truffles!---and were generally used as lap dogs and companions. Small poodles 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.



QUINN

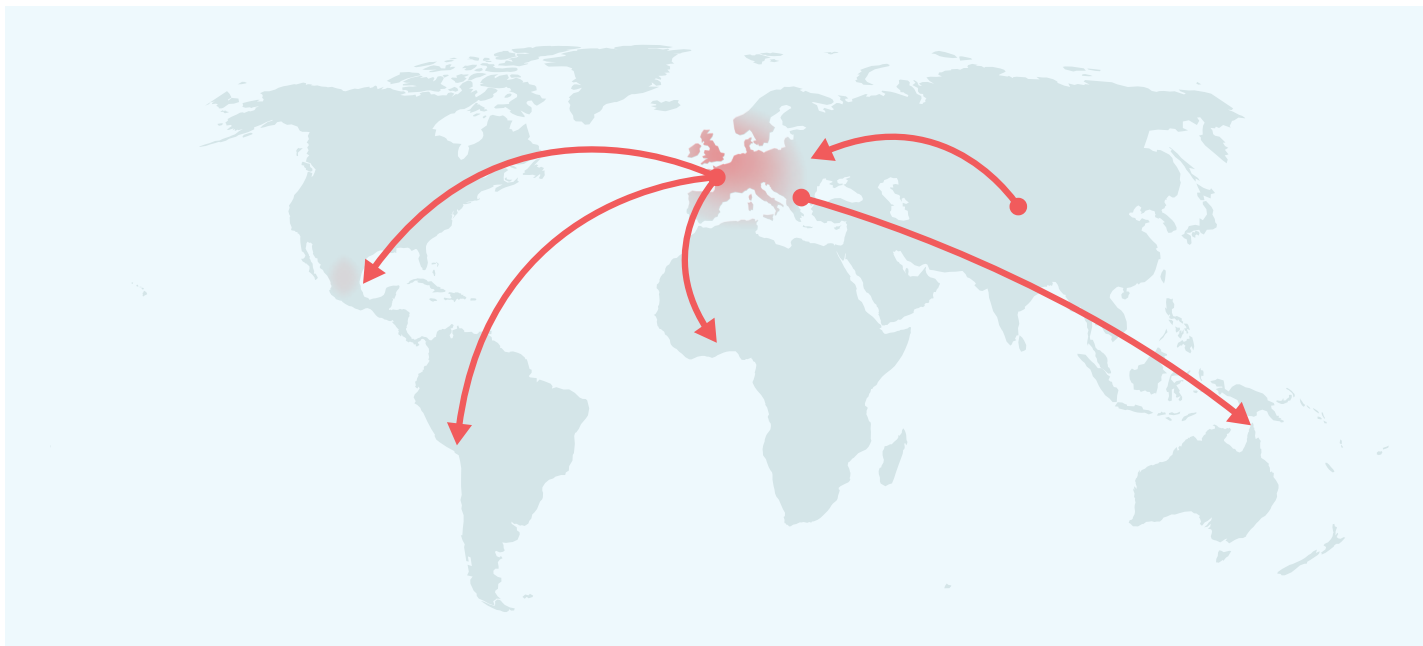


DNA Test Report

Test Date: October 25th, 2023

embk.me/quinn1194

MATERNAL LINE



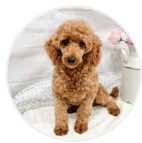
Through Quinn's mitochondrial DNA we can trace her mother's ancestry back to where dogs and people first became friends. This map helps you visualize the routes that her ancestors took to your home. Their story is described below the map.

HAPLOGROUP: A1b

This female lineage was very likely one of the original lineages in the wolves that were first domesticated into dogs in Central Asia about 15,000 years ago. Since then, the lineage has been very successful and travelled the globe! Dogs from this group are found in ancient Bronze Age fossils in the Middle East and southern Europe. By the end of the Bronze Age, it became exceedingly common in Europe. These dogs later became many of the dogs that started some of today's most popular breeds, like German Shepherds, Pugs, Whippets, English Sheepdogs and Miniature Schnauzers. During the period of European colonization, the lineage became even more widespread as European dogs followed their owners to far-flung places like South America and Oceania. It's now found in many popular breeds as well as village dogs across the world!

HAPLOTYPE: A268

Part of the large A1b haplogroup, this uncommon haplotype occurs most frequently in Labrador Retrievers and has been spotted less often in Golden Retrievers, Poodles, and Chihuahuas.



QUINN



DNA Test Report

Test Date: October 25th, 2023

embk.me/quinn1194

TRAITS: COAT COLOR

TRAIT	RESULT
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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** allele do not produce dark hairs at all, and will be "red" over their entire body. The shade of red, which can range from a deep copper to yellow/gold to cream, is dependent on other genetic factors including the Intensity loci. In addition to determining if a dog can develop dark hairs at all, the E Locus can give a dog a black "mask" or "widow's peak," unless the dog has overriding coat color genetic factors. Dogs with one or two copies of the **Em** allele usually have a melanistic mask (dark facial hair as commonly seen in the German Shepherd and Pug). Dogs with no copies of **Em** but one or two copies of the **Eg** allele usually have a melanistic "widow's peak" (dark forehead hair as commonly seen in the Afghan Hound and Borzoi, where it is called either "grizzle" or "domino").

No dark hairs anywhere (ee)

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 brindle rather than black or brown.

Not expressed (K^Bk^Y)



TRAITS: COAT COLOR (CONTINUED)

TRAIT	RESULT
--------------	---------------

Intensity Loci LINKAGE

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^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.

Not expressed (a⁺a)

D Locus (MLPH)

The D locus result that we report is determined by two different genetic variants that can work together to cause diluted pigmentation. These are the common **d** allele, also known as "**d1**", and a less common allele known as "**d2**". 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. To view your dog's **d1** and **d2** test results, click the "SEE DETAILS" link in the upper right hand corner of the "Base Coat Color" section of the Traits page, and then click the "VIEW SUBLOCUS RESULTS" link at the bottom of the page.

Not expressed (Dd)



QUINN



DNA Test Report

Test Date: October 25th, 2023

embk.me/quinn1194

TRAITS: COAT COLOR (CONTINUED)

TRAIT	RESULT
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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)

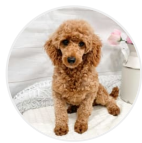
The "Saddle Tan" pattern causes the black hairs to recede into a "saddle" shape on the back, leaving a tan face, legs, and belly, as a dog ages. The Saddle Tan pattern is characteristic of breeds like the Corgi, Beagle, and German Shepherd. Dogs that have the **ll** genotype at this locus are more likely 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^t** allele, so dogs that do not express **a^t** 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)



QUINN



DNA Test Report

Test Date: October 25th, 2023

embk.me/quinn1194

TRAITS: COAT COLOR (CONTINUED)

TRAIT	RESULT
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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) LINKAGE

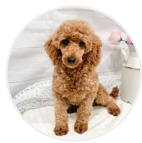
The R Locus regulates the presence or absence of the roan coat color pattern. Partial duplication of the USH2A gene is strongly associated with this coat pattern. Dogs with at least one **R** allele will likely have roaning on otherwise uniformly unpigmented white areas. Roan appears in white areas controlled 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)



QUINN



DNA Test Report

Test Date: October 25th, 2023

embk.me/quinn1194

TRAITS: OTHER COAT TRAITS

TRAIT	RESULT
--------------	---------------

Furnishings (RSPO2) LINKAGE

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)**

Coat Length (FGF5)

The FGF5 gene is known to affect hair length in many different species, including cats, dogs, mice, and humans. In dogs, the **T** allele confers a long, silky haircoat as observed in the Yorkshire Terrier and the Long Haired Whippet. The ancestral **G** allele causes a shorter coat as seen in the Boxer or the American Staffordshire Terrier. In certain breeds (such as Corgi), the long haircoat is described as "fluff."

Likely long coat (TT)

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)**

Hairlessness (FOXI3) LINKAGE

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**

**Very unlikely to be
hairless (NN)**



QUINN



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TRAITS: OTHER COAT TRAITS (CONTINUED)

TRAIT **RESULT**

Oculocutaneous Albinism Type 2 (SLC45A2) LINKAGE

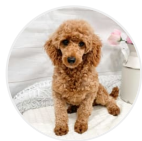
Dogs with two copies **DD** of this deletion in the SLC45A2 gene have oculocutaneous albinism (OCA), also known as Doberman Z Factor Albinism, a recessive condition characterized by severely reduced or absent pigment in the eyes, skin, and hair. Affected dogs sometimes suffer from vision problems due 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)

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 curly coat (TT)



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TRAITS: OTHER BODY FEATURES

TRAIT	RESULT
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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 (AC)

Tail Length (T)

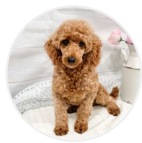
Whereas most dogs have two **C** alleles and a long tail, dogs with one **G** allele are likely to have a bobtail, which is an unusually short or absent tail. This mutation causes natural bobtail in many breeds including the Pembroke Welsh Corgi, the Australian Shepherd, and the Brittany Spaniel. Dogs 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.

Likely to have hind dew claws (CT)



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TRAITS: OTHER BODY FEATURES (CONTINUED)

TRAIT	RESULT
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Blue Eye Color (ALX4) LINKAGE

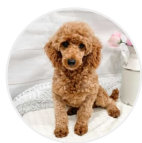
Embark researchers discovered this large duplication associated with blue eyes in Arctic breeds like Siberian Husky as well as tri-colored (non-merle) Australian Shepherds. Dogs with at least one copy of the duplication (**Dup**) are more likely to have at least one blue eye. Some dogs with the duplication 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
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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.

Intermediate (GA)

Body Size (STC2)	
-------------------------	--

The **A** allele is associated with smaller body size.

Intermediate (TA)

Body Size (GHR - E191K)	
--------------------------------	--

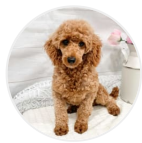
The **A** allele is associated with smaller body size.

Smaller (AA)

Body Size (GHR - P177L)	
--------------------------------	--

The **T** allele is associated with smaller body size.

Larger (CC)



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TRAITS: PERFORMANCE

TRAIT	RESULT
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Altitude Adaptation (EPAS1)

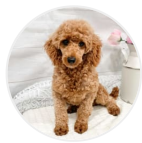
This mutation causes dogs to be especially tolerant of low oxygen environments (hypoxia), such as those found at high elevations. Dogs with at least one **A** allele are less susceptible to "altitude sickness." This mutation was originally identified in breeds from high altitude areas such as the Tibetan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

Normal altitude tolerance (GG)

Appetite (POMC) LINKAGE

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 Quinn's genetic health results:

If Quinn 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 Quinn 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 256 genetic health risks we analyzed, we found 2 results that you should learn about.

Increased risk results (1)

Intervertebral Disc Disease (Type I)

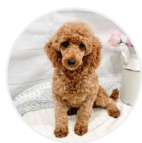
Notable results (1)

ALT Activity

Clear results

Breed-relevant (5)

Other (248)



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BREED-RELEVANT RESULTS

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

 Intervertebral Disc Disease (Type I) (FGF4 retrogene - CFA12)	Increased risk
 GM2 Gangliosidosis (HEXB, Poodle Variant)	Clear
 Neonatal Encephalopathy with Seizures, NEWS (ATF2)	Clear
 Osteochondrodysplasia (SLC13A1, Poodle Variant)	Clear
 Progressive Retinal Atrophy, prcd (PRCD Exon 1)	Clear
 Von Willebrand Disease Type I, Type I vWD (VWF)	Clear





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OTHER RESULTS

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

 ALT Activity (GPT)	Notable
 2-DHA Kidney & Bladder Stones (APRT)	Clear
 Acral Mutilation Syndrome (GDNF-AS, Spaniel and Pointer Variant)	Clear
 Alaskan Husky Encephalopathy (SLC19A3)	Clear
 Alaskan Malamute Polyneuropathy, AMPN (NDRG1 SNP)	Clear
 Alexander Disease (GFAP)	Clear
 Anhidrotic Ectodermal Dysplasia (EDA Intron 8)	Clear
 Autosomal Dominant Progressive Retinal Atrophy (RHO)	Clear
 Bald Thigh Syndrome (IGFBP5)	Clear
 Bernard-Soulier Syndrome, BSS (GP9, Cocker Spaniel Variant)	Clear
 Bully Whippet Syndrome (MSTN)	Clear
 Canine Elliptocytosis (SPTB Exon 30)	Clear
 Canine Fucosidosis (FUCA1)	Clear
 Canine Leukocyte Adhesion Deficiency Type I, CLAD I (ITGB2, Setter Variant)	Clear
 Canine Leukocyte Adhesion Deficiency Type III, CLAD III (FERMT3, German Shepherd Variant)	Clear
 Canine Multifocal Retinopathy, cmr1 (BEST1 Exon 2)	Clear
 Canine Multifocal Retinopathy, cmr2 (BEST1 Exon 5, Coton de Tulear Variant)	Clear
 Canine Multifocal Retinopathy, cmr3 (BEST1 Exon 10 Deletion, Finnish and Swedish Lapphund, Lapponian Herder Variant)	Clear



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OTHER RESULTS

- ✔ Canine Multiple System Degeneration (SERAC1 Exon 4, Chinese Crested Variant) Clear
- ✔ Canine Multiple System Degeneration (SERAC1 Exon 15, Kerry Blue Terrier Variant) Clear
- ✔ Cardiomyopathy and Juvenile Mortality (YARS2) Clear
- ✔ Centronuclear Myopathy, CNM (PTPLA) Clear
- ✔ Cerebellar Hypoplasia (VLDLR, Eurasier Variant) Clear
- ✔ Chondrodystrophy (ITGA10, Norwegian Elkhound and Karelian Bear Dog Variant) Clear
- ✔ Cleft Lip and/or Cleft Palate (ADAMTS20, Nova Scotia Duck Tolling Retriever Variant) Clear
- ✔ Cleft Palate, CP1 (DLX6 intron 2, Nova Scotia Duck Tolling Retriever Variant) Clear
- ✔ Cobalamin Malabsorption (CUBN Exon 8, Beagle Variant) Clear
- ✔ Cobalamin Malabsorption (CUBN Exon 53, Border Collie Variant) Clear
- ✔ Collie Eye Anomaly (NHEJ1) Clear
- ✔ Complement 3 Deficiency, C3 Deficiency (C3) Clear
- ✔ Congenital Cornification Disorder (NSDHL, Chihuahua Variant) Clear
- ✔ Congenital Hypothyroidism (TPO, Rat, Toy, Hairless Terrier Variant) Clear
- ✔ Congenital Hypothyroidism (TPO, Tenterfield Terrier Variant) Clear
- ✔ Congenital Hypothyroidism with Goiter (TPO Intron 13, French Bulldog Variant) Clear
- ✔ Congenital Hypothyroidism with Goiter (SLC5A5, Shih Tzu Variant) Clear
- ✔ Congenital Macrothrombocytopenia (TUBB1 Exon 1, Cairn and Norfolk Terrier Variant) Clear



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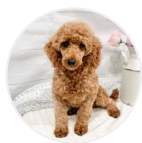
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OTHER RESULTS

<input checked="" type="checkbox"/> Congenital Myasthenic Syndrome, CMS (COLQ, Labrador Retriever Variant)	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
<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"/> 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 (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"/> Degenerative Myelopathy, DM (SOD1A)	Clear
<input checked="" type="checkbox"/> Demyelinating Polyneuropathy (SBF2/MTRM13)	Clear



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OTHER RESULTS

<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"/> 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"/> Exercise-Induced Collapse, EIC (DNM1)	Clear
<input checked="" type="checkbox"/> Factor VII Deficiency (F7 Exon 5)	Clear



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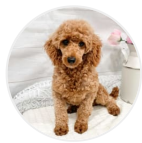
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OTHER RESULTS

<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 (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
<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"/> Golden Retriever Progressive Retinal Atrophy 2, GR-PRA2 (TTC8)	Clear



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OTHER RESULTS

- Goniodysgenesis and Glaucoma, Pectinate Ligament Dysplasia, PLD (OLFM3) Clear
- Hemophilia A (F8 Exon 11, German Shepherd Variant 1) Clear
- Hemophilia A (F8 Exon 1, German Shepherd Variant 2) Clear
- Hemophilia A (F8 Exon 10, Boxer Variant) Clear
- Hemophilia B (F9 Exon 7, Terrier Variant) Clear
- Hemophilia B (F9 Exon 7, Rhodesian Ridgeback Variant) Clear
- Hereditary Ataxia, Cerebellar Degeneration (RAB24, Old English Sheepdog and Gordon Setter Variant) Clear
- Hereditary Cataracts (HSF4 Exon 9, Australian Shepherd Variant) Clear
- Hereditary Footpad Hyperkeratosis (FAM83G, Terrier and Kromfohrlander Variant) Clear
- Hereditary Footpad Hyperkeratosis (DSG1, Rottweiler Variant) Clear
- Hereditary Nasal Parakeratosis (SUV39H2 Intron 4, Greyhound Variant) Clear
- Hereditary Nasal Parakeratosis, HNPK (SUV39H2) Clear
- Hereditary Vitamin D-Resistant Rickets (VDR) Clear
- Hypocatalasia, Acatlasemia (CAT) Clear
- Hypomyelination and Tremors (FNIP2, Weimaraner Variant) Clear
- Hypophosphatasia (ALPL Exon 9, Karelian Bear Dog Variant) Clear
- Ichthyosis (NIPAL4, American Bulldog Variant) Clear
- Ichthyosis (ASPRV1 Exon 2, German Shepherd Variant) Clear



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OTHER RESULTS

<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"/> 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"/> 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



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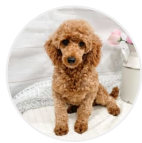
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OTHER RESULTS

- ✓ Leonberger Polyneuropathy 2 (GJA9) Clear
- ✓ Lethal Acrodermatitis, LAD (MKLN1) Clear
- ✓ Leukodystrophy (TSEN54 Exon 5, Standard Schnauzer Variant) Clear
- ✓ Ligneous Membranitis, LM (PLG) Clear
- ✓ Limb Girdle Muscular Dystrophy (SGCD, Boston Terrier Variant) Clear
- ✓ Limb-Girdle Muscular Dystrophy 2D (SGCA Exon 3, Miniature Dachshund Variant) Clear
- ✓ Long QT Syndrome (KCNQ1) Clear
- ✓ Lundehund Syndrome (LEPREL1) Clear
- ✓ Macular Corneal Dystrophy, MCD (CHST6) Clear
- ✓ Malignant Hyperthermia (RYR1) Clear
- ✓ May-Hegglin Anomaly (MYH9) Clear
- ✓ 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



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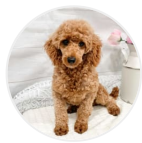
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OTHER RESULTS

- ✓ 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
- ✓ Multiple Drug Sensitivity (ABCB1) Clear
- ✓ Muscular Dystrophy (DMD, Cavalier King Charles Spaniel Variant 1) Clear
- ✓ Muscular Dystrophy (DMD, Golden 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 7, Miniature Schnauzer Variant) Clear
- ✓ Narcolepsy (HCRTR2 Exon 1, Dachshund Variant) Clear
- ✓ Narcolepsy (HCRTR2 Intron 4, Doberman Pinscher Variant) Clear
- ✓ Narcolepsy (HCRTR2 Intron 6, Labrador Retriever Variant) Clear
- ✓ Nemaline Myopathy (NEB, American Bulldog Variant) Clear
- ✓ Neonatal Cerebellar Cortical Degeneration (SPTBN2, Beagle Variant) Clear
- ✓ Neonatal Interstitial Lung Disease (LAMP3) Clear
- ✓ Neuroaxonal Dystrophy, NAD (VPS11, Rottweiler Variant) Clear
- ✓ Neuroaxonal Dystrophy, NAD (TECPR2, Spanish Water Dog Variant) Clear
- ✓ Neuronal Ceroid Lipofuscinosis 1, NCL 1 (PPT1 Exon 8, Dachshund Variant 1) Clear



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OTHER RESULTS

✔ Neuronal Ceroid Lipofuscinosis 10, NCL 10 (CTSD Exon 5, American Bulldog Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 2, NCL 2 (TPP1 Exon 4, Dachshund Variant 2)	Clear
✔ Neuronal Ceroid Lipofuscinosis 5, NCL 5 (CLN5 Exon 4 SNP, Border Collie Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 5, NCL 5 (CLN5 Exon 4 Deletion, Golden Retriever Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 6, NCL 6 (CLN6 Exon 7, Australian Shepherd Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 7, NCL 7 (MFSD8, Chihuahua and Chinese Crested Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 8, NCL 8 (CLN8, Australian Shepherd Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 8, NCL 8 (CLN8 Exon 2, English Setter Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis 8, NCL 8 (CLN8 Insertion, Saluki Variant)	Clear
✔ Neuronal Ceroid Lipofuscinosis, Cerebellar Ataxia, NCL4A (ARSG Exon 2, American Staffordshire Terrier Variant)	Clear
✔ Oculocutaneous Albinism, OCA (SLC45A2 Exon 6, Bullmastiff Variant)	Clear
✔ Oculocutaneous Albinism, OCA (SLC45A2, Small Breed Variant)	Clear
✔ Oculoskeletal Dysplasia 2 (COL9A2, Samoyed Variant)	Clear
✔ Osteogenesis Imperfecta (COL1A2, Beagle Variant)	Clear
✔ Osteogenesis Imperfecta (SERPINH1, Dachshund Variant)	Clear
✔ Osteogenesis Imperfecta (COL1A1, Golden Retriever Variant)	Clear
✔ P2Y12 Receptor Platelet Disorder (P2Y12)	Clear
✔ Pachyonychia Congenita (KRT16, Dogue de Bordeaux Variant)	Clear



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OTHER RESULTS

<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
<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, Bardet-Biedl Syndrome (BBS2 Exon 11, Shetland Sheepdog Variant)	Clear



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OTHER RESULTS

- | | |
|---|-------|
| ✓ Progressive Retinal Atrophy, CNGA (CNGA1 Exon 9) | Clear |
| ✓ Progressive Retinal Atrophy, crd1 (PDE6B, American Staffordshire Terrier Variant) | Clear |
| ✓ Progressive Retinal Atrophy, crd4/cord1 (RPGRIP1) | Clear |
| ✓ Progressive Retinal Atrophy, PRA1 (CNGB1) | Clear |
| ✓ Progressive Retinal Atrophy, PRA3 (FAM161A) | Clear |
| ✓ Progressive Retinal Atrophy, rcd1 (PDE6B Exon 21, Irish Setter Variant) | Clear |
| ✓ Progressive Retinal Atrophy, rcd3 (PDE6A) | Clear |
| ✓ Proportionate Dwarfism (GH1 Exon 5, Chihuahua Variant) | Clear |
| ✓ Protein Losing Nephropathy, PLN (NPHS1) | Clear |
| ✓ Pyruvate Dehydrogenase Deficiency (PDP1, Spaniel Variant) | Clear |
| ✓ Pyruvate Kinase Deficiency (PKLR Exon 5, Basenji Variant) | Clear |
| ✓ Pyruvate Kinase Deficiency (PKLR Exon 7, Beagle Variant) | Clear |
| ✓ Pyruvate Kinase Deficiency (PKLR Exon 10, Terrier Variant) | Clear |
| ✓ Pyruvate Kinase Deficiency (PKLR Exon 7, Labrador Retriever Variant) | Clear |
| ✓ Pyruvate Kinase Deficiency (PKLR Exon 7, Pug Variant) | Clear |
| ✓ Raine Syndrome (FAM20C) | Clear |
| ✓ Recurrent Inflammatory Pulmonary Disease, RIPD (AKNA, Rough Collie Variant) | Clear |
| ✓ Renal Cystadenocarcinoma and Nodular Dermatofibrosis (FLCN Exon 7) | Clear |



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OTHER RESULTS

- | | |
|--|-------|
| ✓ Retina Dysplasia and/or Optic Nerve Hypoplasia (SIX6 Exon 1, Golden Retriever Variant) | Clear |
| ✓ Sensory Neuropathy (FAM134B, Border Collie Variant) | Clear |
| ✓ Severe Combined Immunodeficiency, SCID (PRKDC, Terrier Variant) | Clear |
| ✓ Severe Combined Immunodeficiency, SCID (RAG1, Wetterhoun Variant) | Clear |
| ✓ Shaking Puppy Syndrome (PLP1, English Springer Spaniel Variant) | Clear |
| ✓ Shar-Pei Autoinflammatory Disease, SPAID, Shar-Pei Fever (MTBP) | Clear |
| ✓ Skeletal Dysplasia 2, SD2 (COL11A2, Labrador Retriever Variant) | Clear |
| ✓ Skin Fragility Syndrome (PKP1, Chesapeake Bay Retriever Variant) | Clear |
| ✓ Spinocerebellar Ataxia (SCN8A, Alpine Dachsbracke Variant) | Clear |
| ✓ Spinocerebellar Ataxia with Myokymia and/or Seizures (KCNJ10) | Clear |
| ✓ Spongy Degeneration with Cerebellar Ataxia 1 (KCNJ10) | Clear |
| ✓ Spongy Degeneration with Cerebellar Ataxia 2 (ATP1B2) | Clear |
| ✓ Stargardt Disease (ABCA4 Exon 28, Labrador Retriever Variant) | Clear |
| ✓ Succinic Semialdehyde Dehydrogenase Deficiency (ALDH5A1 Exon 7, Saluki Variant) | Clear |
| ✓ Thrombopathia (RASGRP1 Exon 5, American Eskimo Dog Variant) | Clear |
| ✓ Thrombopathia (RASGRP1 Exon 5, Basset Hound Variant) | Clear |
| ✓ Thrombopathia (RASGRP1 Exon 8, Landseer Variant) | Clear |
| ✓ Trapped Neutrophil Syndrome, TNS (VPS13B) | Clear |



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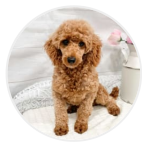
OTHER RESULTS

<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 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
<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"/>	β -Mannosidosis (MANBA Exon 16, Mixed-Breed Variant)	Clear

Mast Cell Tumor

No result





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HEALTH REPORT

Increased risk result

Intervertebral Disc Disease (Type I)

Quinn inherited both copies of the variant we tested for Chondrodystrophy and Intervertebral Disc Disease, CDDY/IVDD, Type I IVDD. Quinn is at increased risk for Type I IVDD.

How to interpret this result

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

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

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

When signs & symptoms develop in affected dogs

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

Signs & symptoms

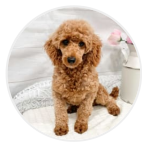
Research indicates that dogs with one or two copies of this variant have a similar risk of developing IVDD. However, there are some breeds (e.g. Beagles and Cocker Spaniels, among others) where this variant has been passed down to nearly all dogs of the breed and most do not show overt clinical signs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

How vets diagnose this condition

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

How this condition is treated

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



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HEALTH REPORT

Notable result

ALT Activity

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

Why is this important to your vet?

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

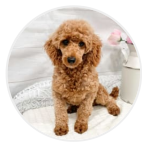
Alanine aminotransferase (ALT) is a clinical tool that can be used by veterinarians to better monitor liver health. This result is not associated with liver disease. ALT is one of several values veterinarians measure on routine blood work to evaluate the liver. It is a naturally occurring enzyme located 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.



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INBREEDING AND DIVERSITY

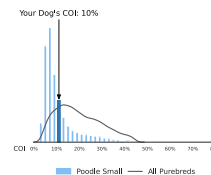
CATEGORY

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.

10%

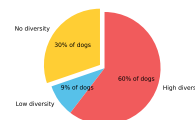


MHC Class II - DLA DRB1

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.

No Diversity

How common is this amount of diversity in purebreds:

