

International Canine Association Inc.

Official Registration Certificate

NAME: Dolly Miller

REGISTRATION NUMBER: OH-ICA-2120687-001

Internet Access Code: OH7941748

BREED: CAVALIER

WHELPED: 09/14/2021

COLORS: Blenheim

SEX: Female

MICROCHIP: 991003001661240

CERTIFICATE ISSUE DATE: 07/16/2025

SIRE: Foundation Stock

DAM: Foundation Stock

CURRENT OWNER:
Marion Miller
P.O. Box 23
Baltic, OH 43804



ORTHOPEDIC FOUNDATION FOR ANIMALS, INC.

DOLLY
registered name

CAVALIER KING CHARLES SPANIEL
breed

1015505
film/test/lab #

991003001661240
tattoo/microchip/DNA profile

2642456
application number

07/16/2025
date of report

RESULTS:

Based upon the exam dated 05/09/2025, 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.

NOREG2642456
registration no.

F
sex

09/14/2021
date of birth

43
age at evaluation in months



A Not-For-Profit Organization

KCS-EYE9649/43F-VPI
O.F.A. NUMBER

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

NORMAL

owner
MARION MILLER
PO BOX 23
BALTIC OH 43804

OFA eCert



Verify QR scan

G.G. KELLER, DVM, MS, DACVR
CHIEF OF VETERINARY SERVICES

www.ofa.org

This electronic OFA certificate was generated on: 07/16/2025

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@OFA.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@ofa.org
Phone number: 573-442-0418
Fax number: 573-875-5073

3382 Capital Circle NE
Tallahassee, FL 32308

Genetic Testing Report

Dolly

Submitted By	Owned By
Cavapoo 3:16	Cavapoo 3:16

Subject Dog	
Name: Dolly	Lab Reference #: 869011
Breed: Cavalier King Charles Spaniel	Sample Date: 12/04/2024
Phenotype: Blenheim	Research Date: 12/04/2024
Sex: Female	Microchip: 991003001661240
Birth: 09/14/2021	

Disorder Results(4 of 14)		
CKCSID	n/n	Clear: Dog is negative for mutation associated with Curly Coat Dry Eye.
DM	n/DM	Heterozygous: Dog carries one copy of the mutation associated with Degenerative Myelopathy. In some breeds, there is a low risk of the dog developing the disorder
EFS	n/n	Clear: Dog is negative for mutation associated with Episodic Falling.
PRA-prcd	n/n	Negative: Dog is negative for the mutation associated with prcd-PRA.

Color Results(5 of 14)		
A-Locus	at/at	Dog has two copies of the gene causing tan points.
B-Locus	B/B	Dog does not carry the mutation for most forms of chocolate coloration.
D-Locus	D/D	Negative: Dog is negative for the mutation associated with a diluted coat color.
E-Locus	e/e	Dog has two copies of cream/yellow.
K-Locus	n/n	Dog is negative for the KB allele, and the coat coloration will be based on the agouti genotype.

Pattern Results(1 of 14)		
S-Locus	S/S	Homozygous: Dog has two copies of S-Locus resulting in a nearly solid white, parti, or piebald coat color.



3382 Capital Circle NE
Tallahassee, FL 32308

Genetic Testing Report Dolly

Trait Results(4 of 14)

Curl 1&2	n/n	The dog is negative for the hair curl allele. The dog will have non-curly hair, and will always pass on the allele responsible for non-curly hair to any offspring
Furnishings	n/n	Non-Furnished: Dog is negative for the furnishings mutation.
Hair Length (1-5)	I ¹ /I ¹	Two copies of the long-hair allele, dog will have longer than average hair per the breed standard.
Shedding	n/n	Dog has no copies of the shedding allele. The dog will have a low propensity towards shedding.



Certificate of Breed

OWNER'S NAME: North America Doodles

OWNER SUPPLIED BREED: Cavalier King Charles
Spaniel

DOG'S NAME: Cavapoos 3 :16 "s Dolly

REGISTRATION ORGANIZATION: --

TEST DATE: September 6th, 2023

REGISTRATION NUMBER: --

This certifies the authenticity of
Cavapoos 3 :16 "s Dolly's canine
genetic background as determined
following careful analysis of more than
200,000 genetic markers.

Welcome to the
Embark family!

WOLFINESS 1.3% MEDIUM

MATERNAL A224
HAPLOTYPE

CAVALIER KING CHARLES SPANIEL



100.0% Cavalier King Charles
Spaniel

Adam Boyko, Ph.D.
CHIEF SCIENCE OFFICER

Ryan Boyko
CHIEF EXECUTIVE OFFICER



CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

FAMILY TREE



PARENTS



Cavalier King
Charles Spaniel



Cavalier King
Charles Spaniel

GRANDPARENTS



Cavalier King
Charles Spaniel



Cavalier King
Charles Spaniel



Cavalier King
Charles Spaniel



Cavalier King
Charles Spaniel

GREAT GRANDPARENTS



Cavalier King
Charles Spaniel



Cavalier King
Charles Spaniel



Cavalier King
Charles Spaniel



Cavalier King
Charles Spaniel



Cavalier King
Charles Spaniel



Cavalier King
Charles Spaniel



Cavalier King
Charles Spaniel



Cavalier King
Charles Spaniel



CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

BREED MIX

 Cavalier King Charles Spaniel : 100.0%

GENETIC STATS

Wolfiness: 1.3 % **MEDIUM**

Predicted adult weight: **21 lbs**

Life stage: **Young adult**

Based on your dog's date of birth provided.

TEST DETAILS

Kit number: EM-19080707

Swab number: 31210953206585



CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly



CAVALIER KING CHARLES SPANIEL

The Cavalier King Charles Spaniel is one of the most popular dog breeds in the United States, and with good reason. Their affectionate personalities combined with their need to be close to their humans make them a lovely breed of choice for families. They tend to get along well with children and peacefully with other dogs and animals in the home (though as the breed used to be used for hunting, caution around small animals should be exercised). The Cavalier has an interesting history -- their ancestors were dogs of the British monarchy, but over time, the breed began to die out as dogs with shorter muzzles were favored in the 1800s. They were crossed with Pugs and some other breeds to change their appearance. However, Roswell Eldridge sought out King Charles Spaniels that had longer muzzles, and recreated the Cavalier as it used to be from those dogs.

Fun Fact

The breed experienced two large bursts in popularity. The first is when Queen Victoria revived the dying breed. The second was when Charlotte, a popular character from the popular show Sex and the City adopted one on TV.

RELATED BREEDS



English Toy Spaniel
Sibling breed



English Springer Spaniel
Cousin breed



English Cocker Spaniel
Cousin breed



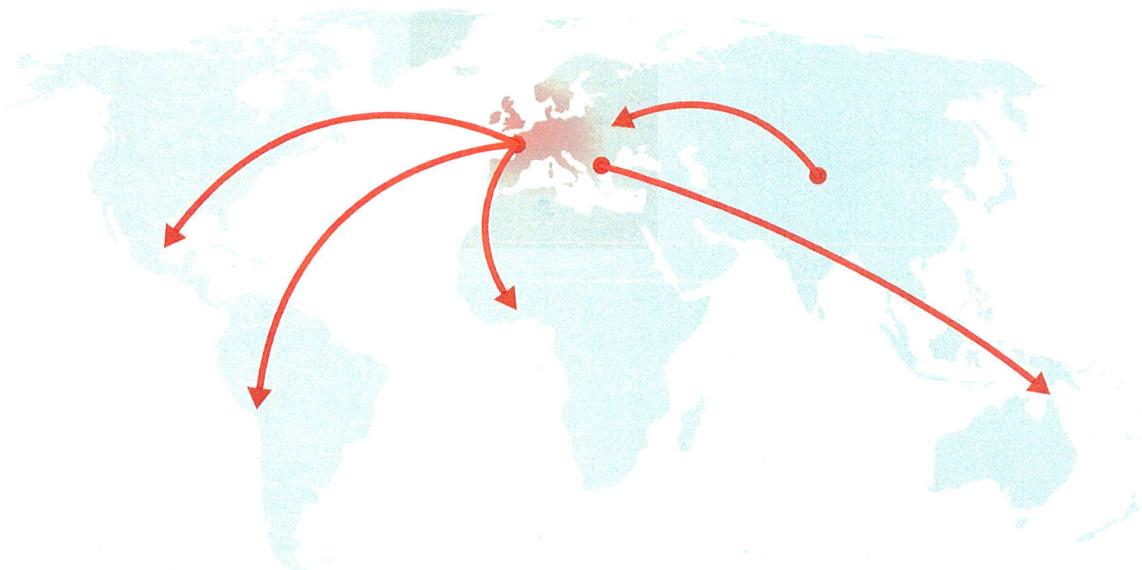
Cocker Spaniel
Cousin breed



Sussex Spaniel
Cousin breed



MATERNAL LINE



Through Cavapoos 3 :16 "s Dolly'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: A1a

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

HAPLOTYPE: A224

Part of the large A1a haplogroup, this haplotype is found in village dogs in Peru, Fiji, and Namibia. Among breeds, we see this haplotype most frequently in Cavalier King Charles Spaniels, Mastiffs, and Boston Terriers.



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

TRAITS: BASE COAT COLOR

TRAIT

RESULT

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

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

**Light colored fur
(cream to red)**

Did You Know? If a dog has a **ee** result then the fur's actual shade can range from a deep copper to yellow/gold to cream - the exact color cannot be predicted solely from this result, and will depend on other genetic factors.

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

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

No impact on skin color

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

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

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

**Any pigmented fur
likely apricot or red**

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



CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

TRAITS: BASE COAT COLOR (CONTINUED)

TRAIT

RESULT

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

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

Likely black colored nose/feet

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

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

This gene helps determine whether a dog has lighter "diluted" pigment. A dog with a **Dd** or **DD** result will not be dilute. A dog with a **dd** result will have all their black or brown pigment lightened ("diluted") to gray or light brown, and may lighten red pigment to cream. This affects their fur, skin, and sometimes eye color. The D locus result that we report is determined by 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 one **d1** allele and one **d2** allele are typically dilute. 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.

Dark (non-dilute) skin

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



CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

TRAITS: COAT COLOR MODIFIERS

TRAIT

RESULT

Hidden Patterning | *K (Dominant Black) Locus* | Gene: *Canine Beta-Defensin 103 (CBD103)* | Genetic Result: ***k^Yk^Y***

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

No impact on coat color

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

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

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

No impact on coat pattern

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

Facial Fur Pattern | *E (Extension) Locus* | Gene: *Melanocortin Receptor 1 (MC1R)* | Genetic Result: ***ee***

In addition to determining if a dog can develop dark fur at all, this gene 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 ***E^m*** in their result will have a mask, which is dark facial fur as seen in the German Shepherd and Pug. Dogs with no ***E^m*** in their result but one or two copies of ***E^g*** will instead have a "widow's peak", which is dark forehead fur.

No dark fur anywhere

Did You Know? The widow's peak is seen in the Afghan Hound and Borzoi, where it is called either "grizzle" or "domino".



CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

TRAITS: COAT COLOR MODIFIERS (CONTINUED)

TRAIT

RESULT

Saddle Tan | Gene: *RALY* | Genetic Result: **NI**

The "Saddle Tan" pattern causes the black hairs to recede into a "saddle" shape on the back, leaving a tan face, legs, and belly, as a dog ages. The Saddle Tan pattern is characteristic of breeds like the Corgi, Beagle, and German Shepherd. Dogs that have the **II** genotype at this locus are more likely to be mostly black with tan points on the eyebrows, muzzle, and legs as commonly seen in the Doberman Pinscher and the Rottweiler. This gene modifies the A Locus **a^t** allele, so dogs that do not express **a^t** are not influenced by this gene.

Did You Know? The Saddle Tan pattern is characteristic of breeds like the Corgi, Beagle, and German Shepherd.

No impact on coat pattern

White Spotting | *S (White Spotting) Locus* | Gene: *MITF* | Genetic Result: **spsp**

This gene is responsible for most of the white spotting observed in dogs. Dogs with a result of **spsp** will have a nearly white coat or large patches of white in their coat. Dogs with a result of **Ssp** will have more limited white spotting that is breed-dependent. A result of **SS** means that a dog likely has no white or minimal white in their coat. The S Locus does not explain all white spotting patterns in dogs and other causes are currently being researched. Some dogs may have small amounts of white on the paws, chest, face, or tail regardless of their result at this gene.

Did You Know? Any dog can have white spotting regardless of coat color. The colored sections of the coat will reflect the dog's other genetic coat color results.

Likely to have large white areas in coat

Roan LINKAGE | *R (Roan) Locus* | Gene: *USH2A* | Genetic Result: **rr**

This gene, along with the S Locus, regulates whether a dog will have roaning. Dogs with at least one copy of **R** will likely have roaning on otherwise uniformly unpigmented white areas created by the S Locus. Roan may not be visible if white spotting is limited to small areas, such as the paws, chest, face, or tail. The extent of roaning varies from uniform roaning to non-uniform roaning, and patchy, non-uniform roaning may look similar to ticking. Roan does not appear in white areas created by other genes, such as a combination of the E Locus and I Locus (for example, Samoyeds). The roan pattern can appear with or without ticking.

Did You Know? Roan, tick, and Dalmatians' spots become visible a few weeks after birth. The R Locus is probably involved in the development of Dalmatians' spots.

Likely no impact on coat pattern



CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

TRAITS: COAT COLOR MODIFIERS (CONTINUED)

TRAIT

RESULT

Merle | *M* (Merle) Locus | Gene: *PMEL* | Genetic Result: **mm**

This gene is responsible for mottled or patchy coat color in some dogs. Dogs with an **M*m** result are likely to appear merle or could be "non-expressing" merle, meaning that the merle pattern is very subtle or not at all evident in their coat. Dogs with an **M*M*** result are likely to have merle or double merle coat patterning. Dogs with a **mm** result are unlikely to have a merle coat pattern.

No impact on coat color

Did You Know? Merle coat patterning is common to several dog breeds including the Australian Shepherd, Catahoula Leopard Dog, and Shetland Sheepdog.

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

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

No impact on coat pattern

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



CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

TRAITS: OTHER COAT TRAITS

TRAIT

RESULT

Furnishings LINKAGE | Gene: RSPO2 | Genetic Result: II

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

Likely unfurnished (no mustache, beard, and/or eyebrows)

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

Coat Length | Gene: FGF5 | Genetic Result: TT

This gene is known to affect hair/fur length in many different species, including cats, dogs, mice, and humans. In dogs, a **TT** result means the dog is likely to have a long, silky coat as seen in the Yorkshire Terrier and the Long Haired Whippet. A **GG** or **GT** result is likely to mean a shorter coat, like in the Boxer or the American Staffordshire Terrier.

Likely long coat

Did You Know? In certain breeds, such as Corgi, the long coat is described as "fluff."

Shedding | Gene: MC5R | Genetic Result: TT

This gene affects how much a dog sheds. Dogs with furnishings or wire-haired coats tend to be low shedders regardless of their result for this gene. In other dogs, a **CC** or **CT** result indicates heavy or seasonal shedding, like many Labradors and German Shepherd Dogs. Dogs with a **TT** result tend to be lighter shedders, like Boxers, Shih Tzus and Chihuahuas.

Likely light shedding

Coat Texture | Gene: KRT71 | Genetic Result: CC

For dogs with long fur, dogs with a **TT** or **CT** result will likely have a wavy or curly coat like the coat of Poodles and Bichon Frises. Dogs with a **CC** result will likely have a straight coat—unless the dog has a "Likely Furnished" result for the Furnishings trait, since this can also make the coat more curly.

Likely straight coat

Did You Know? Dogs with short coats may have straight coats, whatever result they have for this gene.

Hairlessness (Xolo type) LINKAGE | Gene: FOXI3 | Genetic Result: NN





CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

TRAITS: OTHER COAT TRAITS (CONTINUED)

TRAIT

RESULT

Hairlessness (Terrier type) | Gene: SGK3 | Genetic Result: **NN**

This gene is responsible for Hairlessness in the American Hairless Terrier. Dogs with the **DD** result are likely to be hairless. Dogs with the **ND** genotype will have a normal coat, but can pass the **D** variant on to their offspring.

Very unlikely to be hairless

Oculocutaneous Albinism Type 2 LINKAGE | Gene: SLC45A2 | Genetic Result: **NN**

This gene causes oculocutaneous albinism (OCA), also known as Doberman Z Factor Albinism. Dogs with a **DD** result will have OCA. Effects include severely reduced or absent pigment in the eyes, skin, and hair, and sometimes vision problems due to lack of eye pigment (which helps direct and absorb ambient light) and are prone to sunburn. Dogs with a **ND** result will not be affected, but can pass the mutation on to their offspring. We measure this result using a linkage test.

Likely not albino

Did You Know? 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.



CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

TRAITS: OTHER BODY FEATURES

TRAIT

RESULT

Muzzle Length | Gene: BMP3 | Genetic Result: **CC**

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

Likely medium or long muzzle

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

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

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

Likely normal-length tail

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

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

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

Unlikely to have hind dew claws

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



CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

TRAITS: OTHER BODY FEATURES (CONTINUED)

TRAIT

RESULT

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

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

Likely normal muscling

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

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

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

Less likely to have blue eyes

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



CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

TRAITS: BODY SIZE

TRAIT

RESULT

Body Size 1 | Gene: *IGF1* | Genetic Result: **II**

This is one of several genes that influence the size of a dog. A result of **II** for this gene is associated with smaller body size. A result of **NN** is associated with larger body size.

Smaller

Body Size 2 | Gene: *IGFR1* | Genetic Result: **GG**

This is one of several genes that influence the size of a dog. A result of **AA** for this gene is associated with smaller body size. A result of **GG** is associated with larger body size.

Larger

Body Size 3 | Gene: *STC2* | Genetic Result: **AA**

This is one of several genes that influence the size of a dog. A result of **AA** for this gene is associated with smaller body size. A result of **TT** is associated with larger body size.

Smaller

Body Size 4 | Gene: *GHR - E191K* | Genetic Result: **AA**

This is one of several genes that influence the size of a dog. A result of **AA** for this gene is associated with smaller body size. A result of **GG** is associated with larger body size.

Smaller

Body Size 5 | Gene: *GHR - P177L* | Genetic Result: **TT**

This is one of several genes that influence the size of a dog. A result of **TT** for this gene is associated with smaller body size. A result of **CC** is associated with larger body size.

Smaller



CAVAPOOS 3 :16 "S DOLLY



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TRAITS: PERFORMANCE

TRAIT

RESULT

Altitude Adaptation | Gene: *EPAS1* | Genetic Result: **GG**

This gene causes dogs to be especially tolerant of low oxygen environments, such as those found at high elevations. Dogs with a **AA** or **GA** result will be less susceptible to "altitude sickness."

Normal altitude tolerance

Did You Know? This gene was originally identified in breeds from high altitude areas such as the Tibetan Mastiff.

Appetite LINKAGE | Gene: *POMC* | Genetic Result: **NN**

This gene influences eating behavior. An **ND** or **DD** result would predict higher food motivation compared to **NN** result, increasing the likelihood to eat excessively, have higher body fat percentage, and be more prone to obesity. Read more about the genetics of *POMC*, and learn how you can contribute to research, in our blog post (<https://embarkvet.com/resources/blog/pomc-dogs/>). We measure this result using a linkage test.

Normal food motivation

Did You Know? *POMC* is actually short for "proopiomelanocortin," and is a large protein that is broken up into several smaller proteins that have biological activity. The smaller proteins generated from *POMC* control, among other things, distribution of pigment to the hair and skin cells, appetite, and energy expenditure.



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HEALTH REPORT

How to interpret Cavapoos 3 :16 "s Dolly's genetic health results:

If Cavapoos 3 :16 "s Dolly 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 Cavapoos 3 :16 "s Dolly 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 255 genetic health risks we analyzed, we found 4 results that you should learn about.

Increased risk results (1)

Intervertebral Disc Disease (Type I)

Notable results (3)

ALT Activity

Degenerative Myelopathy, DM

Proportionate Dwarfism

Clear results

Breed-relevant (3)

Other (248)



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BREED-RELEVANT RESULTS

Research studies indicate that these results are more relevant to dogs like Cavapoos 3 :16 "s Dolly, and may influence her chances of developing certain health conditions.

- | | |
|---|----------------|
| <input checked="" type="checkbox"/> Intervertebral Disc Disease (Type I) (FGF4 retrogene - CFA12) | Increased risk |
| <input checked="" type="checkbox"/> Dry Eye Curly Coat Syndrome (FAM83H Exon 5) | Clear |
| <input checked="" type="checkbox"/> Episodic Falling Syndrome (BCAN) | Clear |
| <input checked="" type="checkbox"/> Muscular Dystrophy (DMD, Cavalier King Charles Spaniel Variant 1) | Clear |





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OTHER RESULTS

- Canine Multifocal Retinopathy, cmr2 (BEST1 Exon 5, Coton de Tulear Variant) Clear
- Canine Multifocal Retinopathy, cmr3 (BEST1 Exon 10 Deletion, Finnish and Swedish Lapphund, Lapponian Herder Variant) Clear
- Canine Multiple System Degeneration (SERAC1 Exon 4, Chinese Crested Variant) Clear
- Canine Multiple System Degeneration (SERAC1 Exon 15, Kerry Blue Terrier Variant) Clear
- Cardiomyopathy and Juvenile Mortality (YARS2) Clear
- 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





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OTHER RESULTS

- Congenital Hypothyroidism with Goiter (SLC5A5, Shih Tzu Variant) Clear
- Congenital Macrothrombocytopenia (TUBB1 Exon 1, Cairn and Norfolk Terrier Variant) Clear
- Congenital Myasthenic Syndrome, CMS (COLQ, Labrador Retriever Variant) Clear
- Congenital Myasthenic Syndrome, CMS (COLQ, Golden Retriever Variant) Clear
- Congenital Myasthenic Syndrome, CMS (CHAT, Old Danish Pointing Dog Variant) Clear
- Congenital Myasthenic Syndrome, CMS (CHRNE, Jack Russell Terrier Variant) Clear
- Congenital Stationary Night Blindness (LRIT3, Beagle Variant) Clear
- Congenital Stationary Night Blindness (RPE65, Briard Variant) Clear
- Craniomandibular Osteopathy, CMO (SLC37A2) Clear
- Craniomandibular Osteopathy, CMO (SLC37A2 Intron 16, Basset Hound Variant) Clear
- Cystinuria Type I-A (SLC3A1, Newfoundland Variant) Clear
- Cystinuria Type II-A (SLC3A1, Australian Cattle Dog Variant) Clear
- Cystinuria Type II-B (SLC7A9, Miniature Pinscher Variant) Clear
- Day Blindness (CNGB3 Deletion, Alaskan Malamute Variant) Clear
- Day Blindness (CNGA3 Exon 7, German Shepherd Variant) Clear
- Day Blindness (CNGA3 Exon 7, Labrador Retriever Variant) Clear
- Day Blindness (CNGB3 Exon 6, German Shorthaired Pointer Variant) Clear
- Deafness and Vestibular Syndrome of Dobermans, DVDOB, DINGS (MYO7A) Clear



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OTHER RESULTS

<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"/> 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"/> 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





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OTHER RESULTS

- Familial Nephropathy (COL4A4 Exon 3, Cocker Spaniel Variant) Clear
- Familial Nephropathy (COL4A4 Exon 30, English Springer Spaniel Variant) Clear
- Fanconi Syndrome (FAN1, Basenji Variant) Clear
- Fetal-Onset Neonatal Neuroaxonal Dystrophy (MFN2, Giant Schnauzer Variant) Clear
- Glanzmann's Thrombasthenia Type I (ITGA2B Exon 13, Great Pyrenees Variant) Clear
- Glanzmann's Thrombasthenia Type I (ITGA2B Exon 12, Otterhound Variant) Clear
- Globoid Cell Leukodystrophy, Krabbe disease (GALC Exon 5, Terrier Variant) Clear
- Glycogen Storage Disease Type IA, Von Gierke Disease, GSD IA (G6PC, Maltese Variant) Clear
- Glycogen Storage Disease Type IIIA, GSD IIIA (AGL, Curly Coated Retriever Variant) Clear
- Glycogen storage disease Type VII, Phosphofructokinase Deficiency, PFK Deficiency (PFKM, Whippet and English Springer Spaniel Variant) Clear
- Glycogen storage disease Type VII, Phosphofructokinase Deficiency, PFK Deficiency (PFKM, Wachtelhund Variant) Clear
- GM1 Gangliosidosis (GLB1 Exon 2, Portuguese Water Dog Variant) Clear
- GM1 Gangliosidosis (GLB1 Exon 15, Shiba Inu Variant) Clear
- GM1 Gangliosidosis (GLB1 Exon 15, Alaskan Husky Variant) Clear
- GM2 Gangliosidosis (HEXA, Japanese Chin Variant) Clear
- GM2 Gangliosidosis (HEXB, Poodle Variant) Clear
- Golden Retriever Progressive Retinal Atrophy 1, GR-PRA1 (SLC4A3) Clear
- Golden Retriever Progressive Retinal Atrophy 2, GR-PRA2 (TTC8) Clear



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OTHER RESULTS

<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, 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 Footpad Hyperkeratosis (FAM83G, Terrier and Kromfohrlander Variant)	Clear
<input checked="" type="checkbox"/> Hereditary Footpad Hyperkeratosis (DSG1, Rottweiler Variant)	Clear
<input checked="" type="checkbox"/> Hereditary Nasal Parakeratosis (SUV39H2 Intron 4, Greyhound Variant)	Clear
<input checked="" type="checkbox"/> Hereditary Nasal Parakeratosis, HNPK (SUV39H2)	Clear
<input checked="" type="checkbox"/> Hereditary Vitamin D-Resistant Rickets (VDR)	Clear
<input checked="" type="checkbox"/> Hypocatalasia, Acatalasemia (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





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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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OTHER RESULTS

<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
<input checked="" type="checkbox"/> May-Hegglin Anomaly (MYH9)	Clear
<input checked="" type="checkbox"/> Methemoglobinemia (CYB5R3, Pit Bull Terrier Variant)	Clear
<input checked="" type="checkbox"/> Methemoglobinemia (CYB5R3)	Clear
<input checked="" type="checkbox"/> Microphthalmia (RBP4 Exon 2, Soft Coated Wheaten Terrier Variant)	Clear
<input checked="" type="checkbox"/> Mucopolysaccharidosis IIIB, Sanfilippo Syndrome Type B, MPS IIIB (NAGLU, Schipperke Variant)	Clear
<input checked="" type="checkbox"/> Mucopolysaccharidosis Type IIIA, Sanfilippo Syndrome Type A, MPS IIIA (SGSH Exon 6, Dachshund Variant)	Clear
<input checked="" type="checkbox"/> Mucopolysaccharidosis Type IIIA, Sanfilippo Syndrome Type A, MPS IIIA (SGSH Exon 6, New Zealand Huntaway Variant)	Clear
<input checked="" type="checkbox"/> Mucopolysaccharidosis Type VI, Maroteaux-Lamy Syndrome, MPS VI (ARSB Exon 5, Miniature Pinscher Variant)	Clear



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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, 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 Encephalopathy with Seizures, NEWS (ATF2) 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
- Osteochondrodysplasia (SLC13A1, Poodle 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



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OTHER RESULTS

<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, Laponian 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, Laponian Herder Variant)	Clear



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OTHER RESULTS

- ✓ Progressive Retinal Atrophy, Bardet-Biedl Syndrome (BBS2 Exon 11, Shetland Sheepdog Variant) Clear
- ✓ Progressive Retinal Atrophy, CNGA (CNGA1 Exon 9) Clear
- ✓ Progressive Retinal Atrophy, crd1 (PDE6B, American Staffordshire Terrier Variant) Clear
- ✓ Progressive Retinal Atrophy, crd4/cord1 (RPGRIP1) Clear
- ✓ Progressive Retinal Atrophy, PRA1 (CNGB1) Clear
- ✓ Progressive Retinal Atrophy, PRA3 (FAM161A) Clear
- ✓ Progressive Retinal Atrophy, prcd (PRCD Exon 1) Clear
- ✓ Progressive Retinal Atrophy, rcd1 (PDE6B Exon 21, Irish Setter Variant) Clear
- ✓ Progressive Retinal Atrophy, rcd3 (PDE6A) 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, RILD (AKNA, Rough Collie Variant) Clear



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OTHER RESULTS

<input checked="" type="checkbox"/> Renal Cystadenocarcinoma and Nodular Dermatofibrosis (FLCN Exon 7)	Clear
<input checked="" type="checkbox"/> Retina Dysplasia and/or Optic Nerve Hypoplasia (SIX6 Exon 1, Golden Retriever Variant)	Clear
<input checked="" type="checkbox"/> Sensory Neuropathy (FAM134B, Border Collie Variant)	Clear
<input checked="" type="checkbox"/> Severe Combined Immunodeficiency, SCID (PRKDC, Terrier Variant)	Clear
<input checked="" type="checkbox"/> Severe Combined Immunodeficiency, SCID (RAG1, Wetterhoun Variant)	Clear
<input checked="" type="checkbox"/> Shaking Puppy Syndrome (PLP1, English Springer Spaniel Variant)	Clear
<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
<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





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OTHER RESULTS

- Trapped Neutrophil Syndrome, TNS (VPS13B) Clear
- Ullrich-like Congenital Muscular Dystrophy (COL6A3 Exon 10, Labrador Retriever Variant) Clear
- Ullrich-like Congenital Muscular Dystrophy (COL6A1 Exon 3, Landseer Variant) Clear
- Unilateral Deafness and Vestibular Syndrome (PTPRQ Exon 39, Doberman Pinscher) Clear
- Urate Kidney & Bladder Stones (SLC2A9) Clear
- Von Willebrand Disease Type I, Type I vWD (VWF) Clear
- Von Willebrand Disease Type II, Type II vWD (VWF, Pointer Variant) Clear
- Von Willebrand Disease Type III, Type III vWD (VWF Exon 4, Terrier Variant) Clear
- Von Willebrand Disease Type III, Type III vWD (VWF Intron 16, Nederlandse Kooikerhondje Variant) Clear
- Von Willebrand Disease Type III, Type III vWD (VWF Exon 7, Shetland Sheepdog Variant) Clear
- X-Linked Hereditary Nephropathy, XLHN (COL4A5 Exon 35, Samoyed Variant 2) Clear
- X-Linked Myotubular Myopathy (MTM1, Labrador Retriever Variant) Clear
- X-Linked Progressive Retinal Atrophy 1, XL-PRA1 (RPGR) Clear
- X-linked Severe Combined Immunodeficiency, X-SCID (IL2RG Exon 1, Basset Hound Variant) Clear
- X-linked Severe Combined Immunodeficiency, X-SCID (IL2RG, Corgi Variant) Clear
- Xanthine Urolithiasis (XDH, Mixed Breed Variant) Clear
- β -Mannosidosis (MANBA Exon 16, Mixed-Breed Variant) Clear





DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

HEALTH REPORT

Increased risk result

Intervertebral Disc Disease (Type I)

Cavapoos 3 :16 "s Dolly inherited both copies of the variant we tested for Chondrodystrophy and Intervertebral Disc Disease, CDDY/IVDD, Type I IVDD

Cavapoos 3 :16 "s Dolly is at increased risk for Type I IVDD

How to interpret this result

Cavapoos 3 :16 "s Dolly 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



DNA Test Report

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HEALTH REPORT

Notable result

ALT Activity

Cavapoos 3 :16 "s Dolly inherited one copy of the variant we tested for Alanine Aminotransferase Activity

Why is this important to your vet?

Cavapoos 3 :16 "s Dolly has one copy of a variant associated with reduced ALT activity as measured on veterinary blood chemistry panels. Please inform your veterinarian that Cavapoos 3 :16 "s Dolly has this genotype, as ALT is often used as an indicator of liver health and Cavapoos 3 :16 "s Dolly is likely to have a lower than average resting ALT activity. As such, an increase in Cavapoos 3 :16 "s Dolly'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.



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

HEALTH REPORT

Notable result

Degenerative Myelopathy, DM

Cavapoos 3 :16 "s Dolly inherited one copy of the variant we tested for Degenerative Myelopathy, DM

What does this result mean?

Because this variant is inherited in an autosomal recessive manner (meaning dogs need two copies of the variant to develop the disease), Cavapoos 3 :16 "s Dolly is unlikely to develop this condition due to the variant. This result may be important if you decide to breed this dog - we recommend genetic testing potential mates for this condition.

What is Degenerative Myelopathy, DM?

The dog equivalent of Amyotrophic Lateral Sclerosis, or Lou Gehrig's disease, DM is a progressive degenerative disorder of the spinal cord. Because the nerves that control the hind limbs are the first to degenerate, the most common clinical signs are back muscle wasting and gait abnormalities.

When signs & symptoms develop in affected dogs

Affected dogs do not usually show signs of DM until they are at least 8 years old.

How vets diagnose this condition

Definitive diagnosis requires microscopic analysis of the spinal cord after death. However, veterinarians use clues such as genetic testing, breed, age, and other diagnostics to determine if DM is the most likely cause of your dog's clinical signs.

How this condition is treated

As dogs are seniors at the time of onset, the treatment for DM is aimed towards increasing their comfort through a combination of lifestyle changes, medication, and physical therapy.

Actions to take if your dog is affected

- Giving your dog the best quality of life for as long as possible is all you can do after receiving this diagnosis.



CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

HEALTH REPORT

Notable result

Proportionate Dwarfism

Cavapoos 3 :16 "s Dolly inherited both copies of the variant we tested for Proportionate Dwarfism
Cavapoos 3 :16 "s Dolly is not known to be at increased risk for Proportionate Dwarfism

What does this result mean?

We do not know whether this increases the risk that Cavapoos 3 :16 "s Dolly will develop this disease.

Scientific Basis

Research studies for this variant have been based on dogs of other breeds. Not enough dogs with the breeds in Cavapoos 3 :16 "s Dolly have been studied to know whether or not this variant will increase Cavapoos 3 :16 "s Dolly's risk of developing this disease.

What is Proportionate Dwarfism?

This variant in the GH1 gene may lead to a growth hormone (GH) abnormality and causes proportionately small stature, coat abnormalities and low blood sugar (hypoglycemia).

When signs & symptoms develop in affected dogs

Clinical signs may be visible as early as a few months of life, but coat and dental abnormalities and small size may not be clear until puppies are older.

How vets diagnose this condition

Clinical history, genetic testing, and laboratory testing can be used to diagnose this form of Proportionate Dwarfism.

How this condition is treated

Your veterinarian may recommend various treatments, including correcting blood sugar, as indicated."

Actions to take if your dog is affected

- Monitor for signs of hypoglycemia including not eating, lethargy, and inability to stand. Call your veterinarian immediately for advice if you notice these signs.



CAVAPOOS 3 :16 "S DOLLY



DNA Test Report

Test Date: September 6th, 2023

embk.me/cavapoos316sdolly

INBREEDING AND DIVERSITY

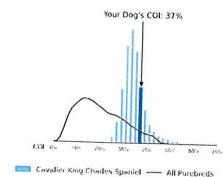
CATEGORY

RESULT

Inbreeding | Gene: n/a | Genetic Result: **37%**

37%

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

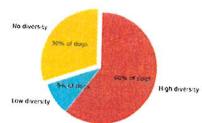


Immune Response 1 | Gene: *DRB1* | Genetic Result: **No Diversity**

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

No Diversity

How common is this amount of diversity in purebreds:



Immune Response 2 | Gene: *DQA1 and DQB1* | Genetic Result: **No Diversity**

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

No Diversity

How common is this amount of diversity in purebreds:

