

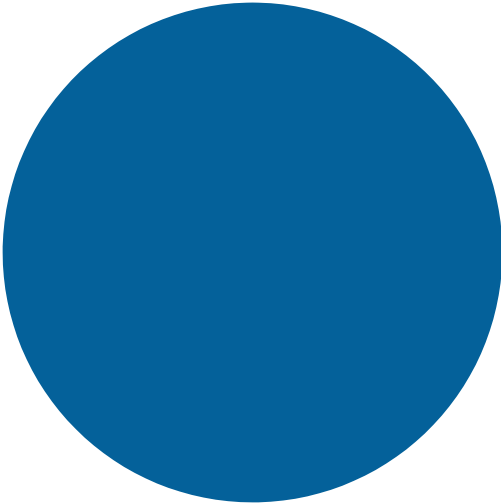
DISCOVER ALL

ABOUT BELLA

The results are in! Let's take a look at what the DNA told us about Bella's ancestry...

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BELLA'S BREED BY PERCENTAGE



● 100% German Shepherd Dog

Exciting news, the results are in! Here's what makes Bella so unique. Using the data generated from Bella's DNA, our sophisticated computer algorithm performed over 17 million calculations! What you see here is Bella's ancestry by percentage.

BELLA'S HEALTH RESULTS

SAMPLE ID: H033565

We have tested Bella's DNA for more than 150 disease-causing mutations. Below is a summary of our findings. For more detailed information on each of these diseases, please log into your account and review your comprehensive health results.



AT RISK - 0

Being "At Risk" means Bella may show or develop signs of one of the following genetic diseases. Please be sure to read the condition information carefully and share these results with your veterinarian.



CARRIER - 0

Carrier status is where a dog has inherited one copy of a disease-causing mutation, when two copies are usually needed for disease signs to occur. The good news is that carriers are unlikely to show disease signs, but there may be a slight increase in risk of disease for some conditions. Please be sure to read the condition information carefully and share these results with your veterinarian.



CLEAR - 152

Bella inherited zero copies of these disease mutations. Be sure to use our share feature to let your veterinarian know about Bella's results. For some of the conditions there may still be undiscovered mutations and/or environmental factors that could lead to similar disease signs. These clear results will help narrow down a future diagnosis if Bella ever gets sick.

CLEAR - 152

Congratulations! Bella inherited zero copies of these disease mutations. Be sure to use our share feature to let your veterinarian know about Bella's results. For some of the conditions there may still be undiscovered mutations and/or environmental factors that could lead to similar disease signs. These clear results will help narrow down a future diagnosis if Bella ever gets sick.

SAMPLE ID: H033565

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Blood

Hemophilia A (Discovered in the German Shepherd Dog)
Phosphofruktokinase Deficiency
Pyruvate Kinase Deficiency (Discovered in the Pug)
P2RY12-associated Bleeding Disorder
Hemophilia B (Discovered in the Airedale Terrier)
May-Hegglin Anomaly
Trapped Neutrophil Syndrome
Pyruvate Kinase Deficiency (Discovered in the West Highland White Terrier)
Hereditary Elliptocytosis
Hemophilia B
Hemophilia B (Discovered in the Lhasa Apso)
Pyruvate Kinase Deficiency (Discovered in the Beagle)
Glanzmann Thrombasthenia Type I
Hemophilia A (Discovered in the Havanese)
von Willebrand's Disease, type 3 (Discovered in the Shetland Sheepdog)
Canine Scott Syndrome
Prekallikrein Deficiency
von Willebrand's Disease, type 3 (Discovered in the Scottish Terrier)
Glanzmann Thrombasthenia Type I
Macrothrombocytopenia
Factor XI Deficiency
Hemophilia A (Discovered in the Boxer)
Hemophilia A (Discovered in the German Shepherd Dog)
von Willebrand's Disease, type 1
Factor VII Deficiency
Canine Leukocyte Adhesion Deficiency (CLAD), type III

Dental

Amelogenesis Imperfecta
Dental Hypomineralization

Drug response

Multidrug Resistance 1

Eye

Progressive Retinal Atrophy (Discovered in the Papillon and Phalène)
Cone Degeneration (Discovered in the German Shorthaired Pointer)
Progressive Retinal Atrophy (Discovered in the Shetland Sheepdog)
Progressive Retinal Atrophy Type III
Dominant Progressive Retinal Atrophy
Canine Multifocal Retinopathy 1
Primary Open Angle Glaucoma and Primary Lens Luxation (Discovered in Chinese Shar-Pei)
Rod-Cone Dysplasia 1
Rod-Cone Dysplasia 1a
Primary Open Angle Glaucoma
Cone Degeneration (Discovered in the Alaskan Malamute)
Rod-Cone Dysplasia 3
Cone-Rod Dystrophy
Cone-Rod Dystrophy 2
Cone-Rod Dystrophy 1
Canine Multifocal Retinopathy 2
Cone Degeneration (Discovered in the German Shepherd Dog)
Primary Lens Luxation
X-Linked Progressive Retinal Atrophy 2

Heart

Dilated Cardiomyopathy
QT Syndrome

Hormonal

Congenital Hypothyroidism (Discovered in the Toy Fox and Rat Terrier)
Congenital Hypothyroidism (Discovered in the Tenterfield Terrier)

Immune system

X-Linked Severe Combined Immunodeficiency (Discovered in the Cardigan Welsh Corgi)
X-Linked Severe Combined Immunodeficiency (Discovered in the Basset Hound)
Complement 3 Deficiency
Severe Combined Immunodeficiency
Canine Cyclic Neutropenia

Lung

Primary Ciliary Dyskinesia
Acute Respiratory Distress Syndrome

Metabolic

Glycogen Storage Disease Type Ia
Pyruvate Dehydrogenase Phosphatase 1 Deficiency
Imerslund-Gräsbeck Syndrome (Discovered in the Border Collie)
Hypocatalasia
Mucopolysaccharidosis Type VII (Discovered in the German Shepherd Dog)
Imerslund-Gräsbeck Syndrome (Discovered in the Beagle)
Glycogen Storage Disease Type IIIa, (GSD IIIa)
Mucopolysaccharidosis Type IIIA

Muscle

Muscular Hypertrophy (Double Muscling)
Muscular Dystrophy (Discovered in the Landseer)
Muscular Dystrophy (Discovered in the Golden Retriever)
Myotubular Myopathy
Centronuclear Myopathy (Discovered in the Great Dane)
Muscular Dystrophy (Discovered in the Cavalier King Charles Spaniel)
Myotonia Congenita
Muscular Dystrophy (Discovered in the Norfolk Terrier)
Centronuclear Myopathy (Discovered in the Labrador Retriever)
X-Linked Myotubular Myopathy
Nemaline Myopathy

Nervous system

Alexander Disease
Neuroaxonal Dystrophy
X-Linked Tremors
Bandera's Neonatal Ataxia
Degenerative Myelopathy
Benign Familial Juvenile Epilepsy
Neuronal Ceroid Lipofuscinosis 10
Sensory Neuropathy
Neuronal Ceroid Lipofuscinosis 8 (Discovered in the English Setter)
Spinocerebellar Ataxia (Late-Onset Ataxia)
Neonatal Cerebellar Cortical Degeneration
Cerebellar Cortical Degeneration
L-2-Hydroxyglutaric Aciduria (Discovered in the Westie)
Neuronal Ceroid Lipofuscinosis 8 (Discovered in the Australian Shepherd)
Spinocerebellar Ataxia with Myokymia and/or Seizures
Narcolepsy (Discovered in the Dachshund)
Juvenile Myoclonic Epilepsy
Cerebellar Ataxia
Alaskan Husky Encephalopathy
Hypomyelination
Spinal Dysraphism
Narcolepsy (Discovered in the Labrador Retriever)
Juvenile Laryngeal Paralysis and Polyneuropathy
Cerebellar Hypoplasia
Lagotto Storage Disease
Sensory Ataxic Neuropathy
Neonatal Encephalopathy with Seizures
Fetal Onset Neuroaxonal Dystrophy
Hyperekplexia or Startle Disease
L-2-Hydroxyglutaric Aciduria
Spongy Degeneration with Cerebellar Ataxia
Neuronal Ceroid Lipofuscinosis 1
Neuronal Ceroid Lipofuscinosis 7

Neuromuscular

GM2 Gangliosidosis (Discovered in the Toy Poodle)
GM2 Gangliosidosis (Discovered in the Japanese Chin)
Globoid Cell Leukodystrophy (Discovered in the Irish Setter)
Exercise-Induced Collapse
Congenital Myasthenic Syndrome (Discovered in the Jack Russell Terrier)

Episodic Falling Syndrome
Congenital Myasthenic Syndrome (Discovered in the Labrador Retriever)
Globoid Cell Leukodystrophy (Discovered in Terriers)
Early-Onset Progressive Polyneuropathy (Discovered in the Alaskan Malamute)

Reproductive system

Persistent Müllerian Duct Syndrome

Skeletal

Cleft Lip & Palate with Syndactyly
Cleft Palate
Cranio-mandibular Osteopathy
Van den Ende-Gupta Syndrome
Osteogenesis Imperfecta (Discovered in the Dachshund)
Spondylocostal Dysostosis
Skeletal Dysplasia 2
Hereditary Vitamin D-Resistant Rickets Type II
Osteogenesis Imperfecta (Discovered in the Beagle)
Osteochondrodysplasia
Musladin-Lueke Syndrome
Chondrodysplasia

Skin

Dystrophic Epidermolysis Bullosa (Discovered in the Golden Retriever)
Lamellar Ichthyosis
Ligneous Membranitis
Ichthyosis (Discovered in the American Bulldog)
Focal Non-Epidermolytic Palmoplantar Keratoderma
Hereditary Footpad Hyperkeratosis
Epidermolytic Hyperkeratosis
Ichthyosis (Discovered in the Great Dane)
X-Linked Ectodermal Dysplasia

Urinary

Xanthinuria (Discovered in a mixed breed dog)
X-Linked Hereditary Nephropathy (Discovered in the Samoyed)
Hyperuricosuria
Fanconi Syndrome
Protein Losing Nephropathy
Cystinuria Type II-A
Cystinuria Type I-A
Xanthinuria (Discovered in the Toy Manchester Terrier)
Polycystic Kidney Disease
Renal Cystadenocarcinoma and Nodular Dermatofibrosis

BELLA'S TRAITS

SAMPLE ID: H033565

Furnishings

Bella does not carry any copies of the gene for 'furnishings' (which would give them a fuzzy beard and eyebrows). This means they probably have smooth, short facial hair. Did you know you can often get 'furnished' and 'unfurnished' dogs within the same breed?

Coat Color Main Possibilities
Genotype: at/at E m/Em ky/ky wt/wt

Bella probably has a dark-colored, saddle-shaped pattern on their back, which is common in breeds like the German Shepherd and Beagle. They'll likely also have a dark facial 'mask'. Did you know some dogs with this trait are born 'black-and-tan' but that the dark hairs fade until only the saddle pattern remains?

Leg Length
Genotype: DD

Bella's legs should be relatively long in length, based on this marker (though there can be other genes that affect leg length). Did you know different dogs can have different leg lengths even if they are the same breed?

Ear Carriage
Genotype: TT

A lot of factors can decide the shape of a dog's ear. But as far as we can tell, Bella probably has perk or upright ears. Did you know this type of ear is recessive (which means you need a copy from each parent to show it)? Common breeds with upright ears include German Shepherd, Chihuahua and Husky.

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Tail Length
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Bella likely was born with a long tail - although the exact length can vary from dog to dog. Long tails are sometimes known as 'coffee table clearers'. (If you've ever seen a long-tailed dog get excited near one, you'll know exactly why.)

BELLA'S TRAITS CONTINUED

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Base Pigment
Color
Genotype: B/B

Bella carries the gene for the 'expression' of black pigment. This means that even though their overall coat color may not be black, they are still able to make black pigment. They will also likely have black around their eyes, a black nose, and may even have black pads on their feet.

Coat Length and
Type
Genotype: TT CC

Bella's coat is probably on the long side. The exact length of a dog's coat is down to several factors so it can vary. Did you know long hair is actually a recessive trait and results from inheriting two 'broken' copies of the gene that tells hairs to stop growing and shed?

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IDEAL WEIGHT

SAMPLE ID: H033565

Based on our findings, we've calculated that Bella's ideal, adult weight should be:

45 lbs - 75 lbs

We've factored everything we know about Bella in predicting a healthy, adult weight. However environmental factors such as the nutrition of Bella's mom during pregnancy and nursing, Bella's nutrition during critical growth months, illness/parasites/ticks/fleas, and exercise levels can affect the actual weight of Bella.

CALCULATING WEIGHT

Our weight-predictive algorithm uses a combination of the following to calculate Bella's ideal, adult weight:

- The published weight ranges of more than 200 purebred dogs.
- The observed weights of purebred dogs, each with an ideal Body Condition Score, from the Banfield® Pet Hospital database.
- Breeds the WISDOM PANEL™ test analysis has identified that reflect a dog's true heritage and genetic complexity.
- A genetic algorithm based on mixed-breed data that calculates the contribution of each set of chromosomal genetic markers.

ENVIRONMENTAL EFFECTS ON WEIGHT

A dog's early life is very important in determining how they will grow and develop. They can fail to reach their ideal weight for a number of reasons, including the diet of their mother during pregnancy and nursing (as well as their own diet as puppies). Illness and disease can play a part too, as can having parasites like roundworms or fleas and ticks. For dogs who are adopted after they are fully-grown, it may be harder to find the historical background on these factors.

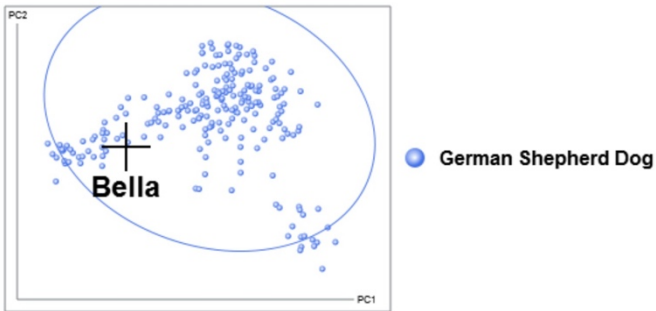
Maintaining a healthy weight is a key factor in Bella having a long and healthy life.

ADDITIONAL BREED TESTS

Our family tree analysis shows that Bella closely resembles a single dog breed, based on the samples in the WISDOM PANEL™ database. We have included some extra tests free of charge to investigate this in more detail.

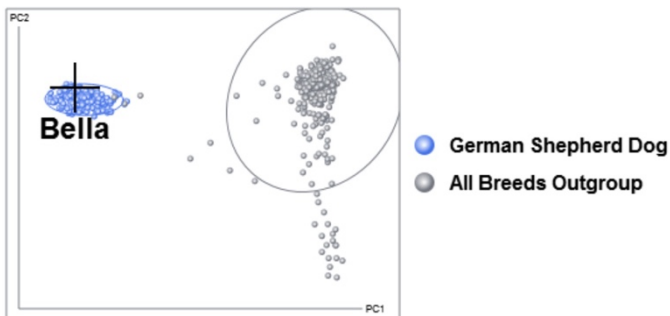
Single Breed Comparison

This analysis shows the relationship between Bella and the German Shepherd Dog samples in our database with each individual dog represented as a dot. The closer the dots on the chart the closer the genetic relationship. Bella's sample falls within the German Shepherd Dog cluster showing that Bella's genetic profile closely resembles the other dogs from this breed in the Wisdom Panel database.



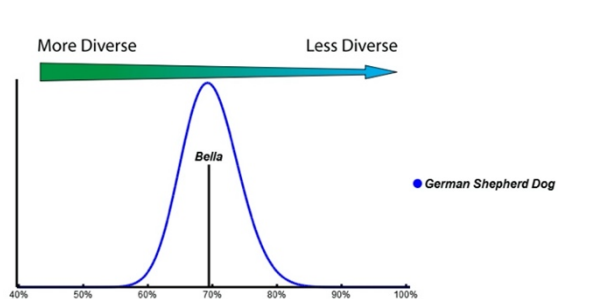
Single Breed Vs. All Breeds

Here we have compared Bella's data to German Shepherd Dog samples, and also a single representative sample from the other breeds in the WISDOM PANEL database. This is another way of showing that Bella's data is more like the German Shepherd Dog than any other breed. Bella's sample falls within the German Shepherd Dog cluster showing that Bella's genetic profile closely resembles the other dogs from this breed in the WISDOM PANEL database.



Homozygosity

Homozygosity is a measure of how many of Bella's genetic markers are identical because the same version was passed down from both the mother and father. Purebred dogs tend to have a higher homozygosity score than most mixed breed dogs, and each breed within the WISDOM PANEL database has a specific range of scores. Bella's homozygosity score falls within the range for the German Shepherd Dog samples found in the WISDOM PANEL database.



WISDOMTM PANEL



STATEMENT OF AUTHENTICATION

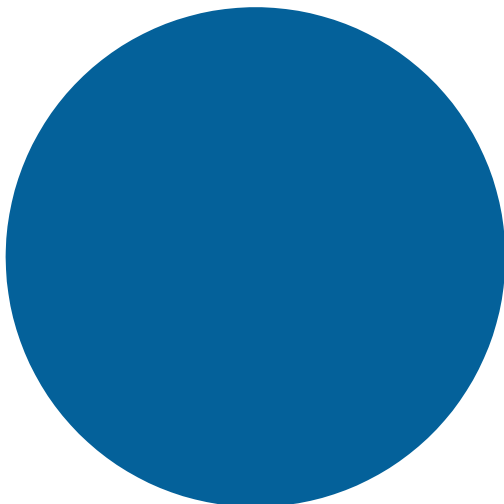
Owner's Name: Doug Case

Dog's Name: Bella

Sample Id: H033565

Date: October 13, 2019

This certifies the authenticity of Bella's canine genetic background as determined, following the careful analysis of more than 1800 genetic markers, by the WISDOM PANEL™ Canine DNA Test. The purebred breed signature matches included in the analysis are those that were detected in the last three generations of Bella's ancestry using the Wisdom Health proprietary breed detection algorithm.



● 100% German Shepherd Dog