

# Wisdom Panel<sup>®</sup> 3.0

## Congratulations!

Bella is a German Shepherd Dog,  
Pomeranian, Whippet Mix

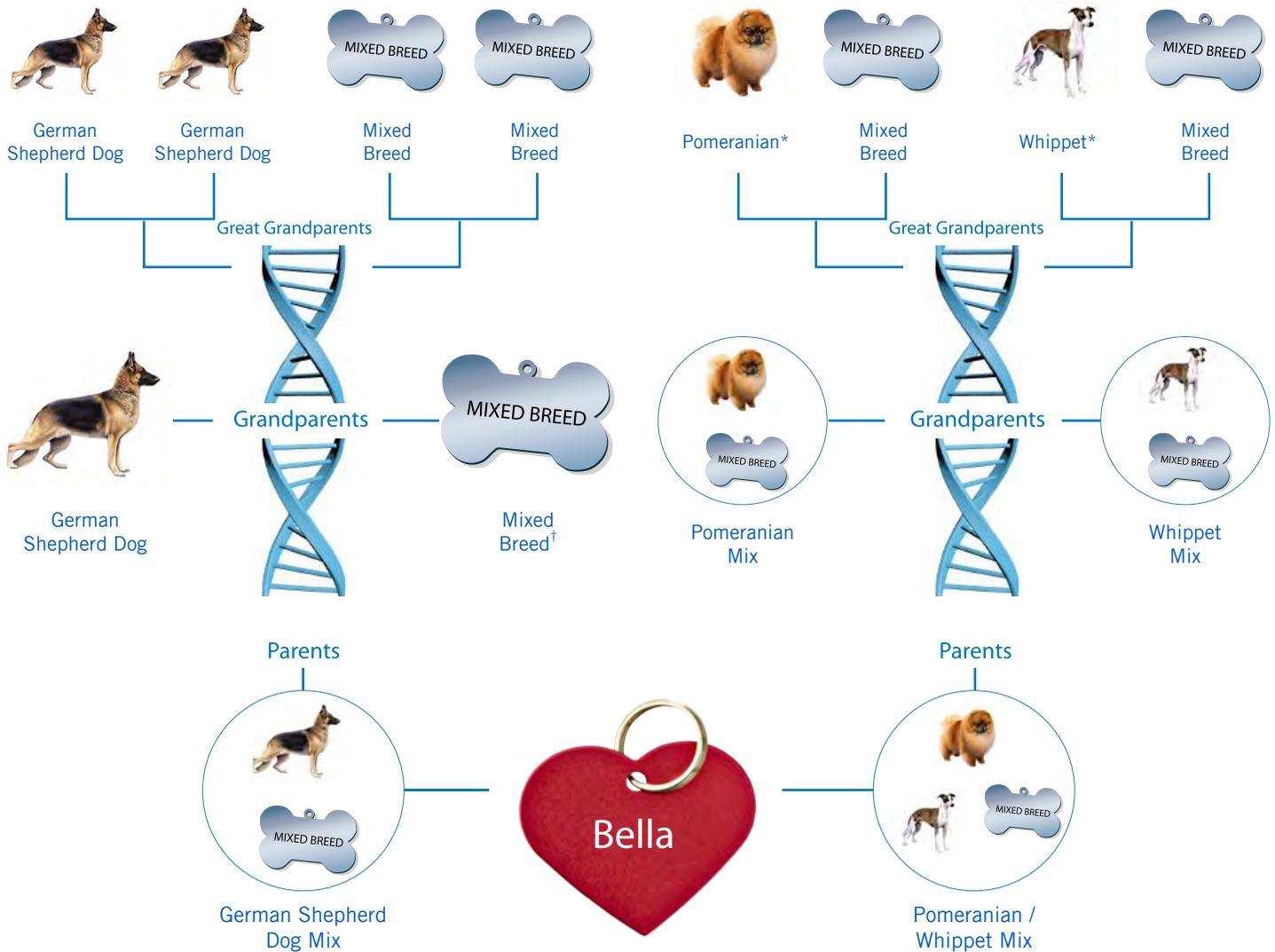
In the following pages, you will learn about:

- KEY BREEDS DETECTED
- KEY BREED HISTORY, APPEARANCE, & BEHAVIOR
- MDR1 SCREENING
- MIXED-BREED ANCESTRY
- HOW KEY PHYSICAL TRAITS ARE INHERITED
- ADDITIONAL INFORMATION



### YOU HAVE A GERMAN SHEPHERD DOG, POMERANIAN, WHIPPET MIX

The *Wisdom Panel* computer algorithm performed over seven million calculations using 11 different models (from a single breed to complex combinations of breeds) to predict the most likely combination of pure and mixed breed dogs in the last 3 ancestral generations that best fit the DNA marker pattern observed in Bella. The ancestry chart depicting the best statistical result of this analysis is shown in the picture below.



Interested in the Mixed Breed ancestry? Look for the Mixed Breed Signatures page later in the report!

\*Breed detected, however at a lower confidence. Such results are not included in accuracy calculations.



# GERMAN SHEPHERD DOG

All dogs should be considered individual animals. Because each is a product of their unique environment and handling, they may exhibit different traits and behaviors than those listed here.



**HEIGHT:**

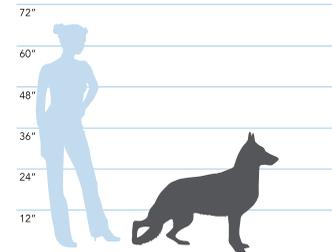
22 - 26 in

**WEIGHT (SHOW):**

48 - 89 lb

**WEIGHT (PET):**

48 - 97 lb



**EARS**



**MUZZLE**



**TAIL**



The modern day German Shepherd breed is a cross between the long-haired, short-haired and wire-haired shepherd dogs of the German regions of Württemberg, Thuringia and Bavaria. Initially bred for herding, due to their strength, intelligence and excellent temperament, they became popular as guard dogs, guide dogs, search and rescue dogs, police dogs and military dogs. Max Emil Von Stephanitz sought to protect and refine the German Shepherd breed at the end of the nineteenth Century. German Shepherds were used as German police and military dogs during World Wars I and II. Allied soldiers during World War I took notice of the Shepherd's use as messenger dogs or search and rescue dogs as they were very good at locating wounded soldiers. Some soldiers introduced the breed to their home countries and the popularity of the German Shepherd took off, making it one of the most popular breeds in the world today. The German Shepherd Dog was recognized by the American Kennel Club in 1908.

German Shepherd Dogs are generally a combination of black and tan, though more or less black may be seen. There is also a "gray" variant where the tip of the hair is black and the rest is tan. A black mask and a black "saddle" are both common traits in this breed. Although not an AKC variant, all-white German Shepherds exist as a separate FCI breed. The coat comes in long and short varieties.



**Do You Recognize Any of These German Shepherd Dog Traits In Bella?**

- Personalities can vary from calm and watchful/observant to energetic.
- Enjoy participating in dog sports such as agility, tracking, flyball, and competitive obedience.
- Eager to learn and respond well to reward-based training.
- There have been reported incidents of German Shepherd Dogs being aggressive with other pets or people.



# POMERANIAN

All dogs should be considered individual animals. Because each is a product of their unique environment and handling, they may exhibit different traits and behaviors than those listed here.



**HEIGHT:**

7 - 12 in

**WEIGHT (SHOW):**

3 - 7 lb

**WEIGHT (PET):**

3 - 10 lb



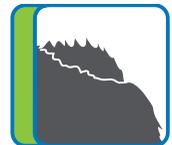
**EARS**



**MUZZLE**

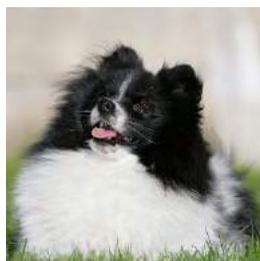


**TAIL**



The roots of today's Pomeranian breed can be traced back to Prussia, in the region of Pomerania – which stretches across modern Germany and Poland along the southern coast of the Baltic Sea. Around 1850, the breed was brought to England where it was given the name Pomeranian, in honor of its homeland, and recognized by the English Kennel Club in 1870. At that time, Pomeranians were much larger than the breed standard we know today. Today's more diminutive Pomeranian was established when breeders set out to create a breed adequate for city living. Through selective breeding, English breeders were finally able to produce a dog that weighed less than twenty pounds and today's breed standard of around five pounds demonstrates just how much the breed has evolved. In 1888, Queen Victoria was gifted with a Pomeranian, and the breed's association with this influential monarch did much for its popularity all over the world. By 1900, the Pomeranian had been recognized by the American Kennel Club and today, the Pomeranian's manageable size and feisty character have made it one of the most popular breeds.

The Pomeranian has a thick double coat which puffs out around the shoulders and chest. All colors are acceptable in the breed standard, and Pomeranians may be black, brindle (black and brown striped), apricot, red, cream, sable, chocolate, or particolored. White markings and a black mask are also possible.



**Do You Recognize Any of These Pomeranian Traits In Bella?**

- Active, intelligent, and alert dogs.
- Eager to learn and responds well to reward-based training using treats or favorite toys.
- Pomeranians seem to enjoy dog sports such as agility, musical canine freestyle, rally and competitive obedience.
- They tend to bark. They can be reserved around strangers and may require careful socialization to prevent or reduce defensive aggressive tendencies.



# WHIPPET

All dogs should be considered individual animals. Because each is a product of their unique environment and handling, they may exhibit different traits and behaviors than those listed here.



**HEIGHT:**

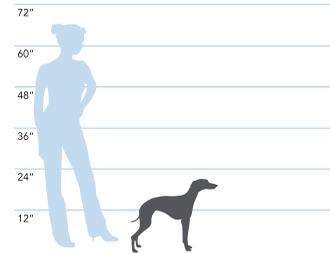
17 - 18 in

**WEIGHT (SHOW):**

25 - 40 lb

**WEIGHT (PET):**

26 - 45 lb



**EARS**



**MUZZLE**



**TAIL**



Many people believe that the Whippet's origins began in nineteenth century England when miners bred the Whippet to race in farmer's fields when they had a day off. The races were known as "rag races" and the dogs were commonly referred to as "the poor man's racehorse" and "the poor man's greyhound." However, this origin story is not true. While the miners of that area did indeed breed the dogs, that is not where the breed originated. The name "Whippet" was actually given to the breed in 1610 and Louis XV was presented with two of the dogs as a gift. In fact, a famous portrait of Louis XV shows him with Misse, one of the two Whippets he was given. It's not hard to see why the breed was used for racing. The Whippet is definitely a fast runner, being able to reach speeds of up to thirty-five miles per hour, and they are also known to be great hunting dogs. The Whippet was imported to the United States by English mill operators in Massachusetts and the popularity of the breed quickly spread. The Whippet was recognized by the American Kennel Club in 1888.

The Whippet may be any color, which includes black, fawn, blue (gray), red, sable, white, tan, or brindle (black and brown stripes). White markings are common, as well as lighter brindle shades, fawn markings, and black masks.



**Do You Recognize Any of These Whippet Traits In Bella?**

- Intelligent, quiet, and usually friendly.
- May chase and potentially harm cats or wildlife.
- As Whippets are sensitive, they respond best to reward-based training using treats or toys.
- Whippets enjoy dog sports such as lure coursing, racing, flyball, Frisbee, agility, and obedience.





### What Does the Mixed-breed Ancestry Mean for BELLA?

A portion of Bella's ancestry was predicted to be mixed beyond the three generations we test for. It is difficult to identify strong individual breed signals in this mixed portion, so we have listed the genetic breed groups with the strongest statistical likelihood below. The breed groups are listed in order of strength with the most likely at the top of the list.



## MDR1 Screening Results

Condition	Gene	Mode of Inheritance	Test Results
Multi-Drug Sensitivity	MDR1	Dominant	Normal/Normal

Please be sure to share these results with your veterinarian at your first opportunity. They may be critical to the health care of your dog.

## Test Results Analysis

MDR1 Normal/Normal - These dogs have two copies of the normal MDR1 gene and do not have the MDR1 mutation. They will not pass on the mutation to their offspring. These dogs are not at increased risk for experiencing side effects from drugs that are pumped by P-glycoprotein.

## About MDR1

MDR1, or Multi-Drug Resistance-1 is a genetic mutation found in many of the herding breeds, some sight-hound breeds and many mixed breed dogs. The MDR1 gene is responsible for production of P-glycoprotein, which is a transport pump that plays an important role in limiting drug absorption and distribution (particularly to the brain), and in enhancing the excretion of many drugs used in dogs.

Some dogs, particularly herding breeds or mixed-breed dogs with herding breed ancestry have a mutation in the MDR1 gene that makes them defective in their ability to limit drug absorption and distribution. These dogs are also slower to eliminate drugs from the body that are normally transported by P-glycoprotein. All dogs have two copies of this gene, and dogs with mutations in both copies will be much more sensitive to many commonly used drugs. Even dogs with only one copy of the mutation, however, are more sensitive to drugs than dogs with two normal MDR1 genes. Therefore it is important to test your dog and share your results with your veterinarian so they can provide your dog with the best possible care.

**For more information about MDR1 and a full list of drugs affected by MDR1 please visit:**  
[http://www.wisdompanel.com/mdr1\\_disease\\_screening/](http://www.wisdompanel.com/mdr1_disease_screening/) or <http://vcpl.vetmed.wsu.edu>

## Origins of the Test

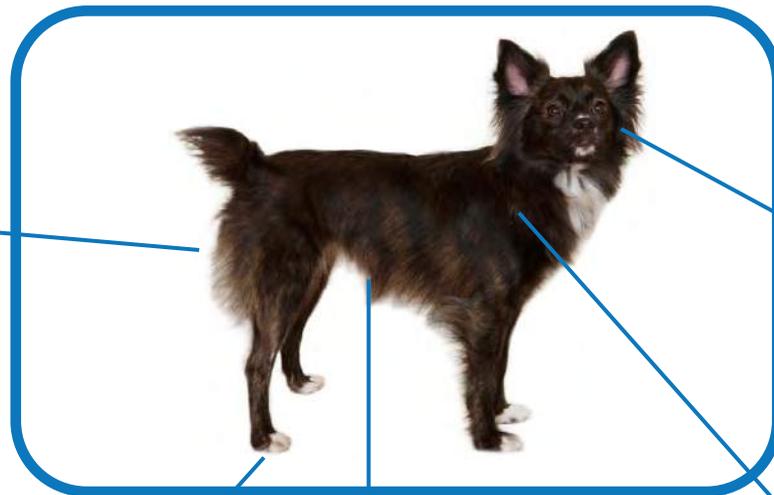
The discovery of the mutation of the multi-drug resistant gene (MDR1) and its effects on multi-drug sensitivity in dogs, was made by Washington State University. It is a patent-protected diagnostic test offered by Washington State University that has been licensed to Mars Veterinary for use in the *Wisdom Panel* tests.



**The Influence of Breeds on Appearance**

This report reveals the breeds detected in your dog’s DNA. It also includes checklists of physical traits associated with these breeds. Breeds can combine their influences in countless, fascinating ways. It’s the unique combination that makes your dog one-of-a-kind.

Your dog may behave like, or strongly resemble, just one of the breeds in its makeup. However much more commonly your dog’s looks and personality will blend aspects of these breeds. In the example below you can see how many of Frankie’s physical traits are due to a blending of breed influences.



**FEATHERING**

The longer hair on the legs, tail and around the ears, is due to dominant modifier genes available from the Shetland Sheepdog.

**BLACK PIGMENT**

This coloring in the nose, eye rims, lips and pads on the feet is due to one copy of the black gene variant, available from all three ancestral breeds.

**WHITE SPOTTING**

This is due to a lack of pigment and is often found in the extremities (feet, chest, face, etc.), but can also extend over more of the body. It can be due to many genes including those found in the three ancestral breeds here.

**BRINDLE COAT COLOR**

The black and tan striping in Frankie’s coat is a dominant trait coming from one copy of the brindle gene variant. This is available from the Italian Greyhound, Parson Russell Terrier and Shetland Sheepdog.

**SHORT HAIR**

This is due to one copy of the gene variant from the Italian Greyhound or the Parson Russell Terrier that is dominant over the long coat gene from the Shetland Sheepdog.

**Wisdom Panel found these breeds in our example dog Frankie:**



**Shetland Sheepdog**



**Italian Greyhound**



**Parson Russell Terrier**



For additional information, watch an illustrative video at <http://youtu.be/UAcP0ch4-C8> - it provides educational content around canine DNA, the basic blueprint for life, and a closer look at inherited genes.





### Predicted Adult Weight Profile

Based upon the breeds detected in Bella's ancestry and the genetic markers analyzed by **Wisdom Panel**, as well as the information provided that Bella is **female** and intact, we have calculated the likely weight that Bella should reach when an adult. The **Wisdom Panel** target weight profile is presented as a range based on the unique mix and proportion of breeds detected.

- If intact, the adult weight is predicted to be between 37 - 49 lbs.
- If spayed, the adult weight is predicted to be between 39 - 52 lbs.

Many factors can influence an adult dog's weight, including sex and neuter status. Both of these factors have been used to calculate the predicted weight profile. Another major influence on canine weight is body condition score, which is a factor of your dog's lifetime nutrition and exercise regimen. For more information visit [WisdomPanel.com](http://WisdomPanel.com) and go to the "How it Works" section.

### Talk to Your Veterinarian

Congratulations on taking the steps to learn about Bella's ancestry and to understand what breeds are in your mixed breed dog using **Wisdom Panel!** Knowing your dog's breeds is more than a novelty, it is a medical necessity. Each breed in your dog's genetic paw print may have unique health concerns you should know about so that you can provide a lifetime of excellent care.



We recommend discussing your dog's ancestry report and genetic disease screen results with your veterinarian, as he or she can help you use your **Wisdom Panel** report to help better care for Bella. The next time you visit your veterinarian, consider asking these questions in addition to any you come up with on your own:

- Are there any specific issues that may be relevant to my dog's well-being?
- Are there any special techniques that may help in training a dog with this particular mix?
- Are there any particular dietary considerations to bear in mind for a dog like mine?

### How Wisdom Panel Works

The process started when you sent a sample to our laboratory, where the DNA was extracted from the cells and examined for the 321 markers that are used in the test. The results for these markers were sent to a computer, that evaluated them using a program designed to consider all of the pedigree trees that are possible in the last three generations. The trees considered include a simple pedigree with a single breed (a likely pure-bred dog), two different breeds at the parental level (a first-generation cross), all the way up to a complex tree with eight different great-grandparent breeds allowed.

Our computer used information from over 250 breeds, types and varieties from our breed database to fill these potential pedigrees. For each of the millions of combinations of ancestry trees built and considered, the computer gave each a score representing how well that selected combination of breeds matched to your dog's data. The pedigree with the overall best score is the one which is shown on the ancestry chart. Only breeds that reached our set confidence threshold for reporting are reported in the ancestry chart.



### ...Or Another Kit for You!

We'd like to say thank you for purchasing a **Wisdom Panel** DNA kit with \$15 off another kit for you, or to pass along to friends or family. Just visit [WisdomPanel.com](http://WisdomPanel.com) and use this promo code\* below at the time of checkout.

**PROMO CODE: ABC123**



### Check Out the Dog Community!

Want to share your results with other **Wisdom Panel** users and dog lovers? We've got a Dog Community for you! Just visit [WisdomPanel.com](http://WisdomPanel.com) and click on "Dog Community" and you can search for dogs with the same mix of breeds as your own, or upload a photo and story about your own dog. It's easy, fun and a great way to share your results.

### Terms and Conditions

Each dog is unique and their physical and behavioral traits will be the result of multiple factors, including genetics, training, handling, and environment. Using a proprietary analysis and database, **Wisdom Panel** products can provide insight into the breed ancestry of your dog, the predicted genetic adult weight range, and breed-related risks of developing certain genetic diseases. A dog's weight range can vary significantly depending on age, diet, and exercise.

**Wisdom Panel** products are not intended to diagnose diseases or predict behavior in any particular dog. **Wisdom Panel** products are designed and intended to be used solely to identify the genetic breed makeup and predict the adult size of such a mixed-breed dog; to confirm the genetic profile observed in a tested dog matches a particular breed profile; or in certain products to identify risks of developing certain genetic diseases or conditions. No other purpose is intended, authorized, or permitted.

Upon receipt of the sample, Mars Veterinary will analyze the dog's DNA to determine the breed(s) present in its recent ancestry. In all cases this is done with a reasonable degree of certainty. Portions of DNA samples of some dogs may not include any purebreds and those ancestors will simply be noted as being mixed breeds. **Wisdom Panel** products are based upon the Mars Veterinary database of validated breeds. If a dog's ancestry contains breeds not represented in our database, the results may identify related breeds that are contained in the database.

In the unlikely event that it is not possible to determine breed history, predicted adult weight range, or breed related health risks, or that an error in the analysis occurs, liability by Mars Veterinary or related companies and individuals is expressly disclaimed. Damages, if any, are limited to the payment actually received by Mars Veterinary for the specified analysis at issue.

Mars Veterinary's testing procedures are designed to provide reliable and accurate results. Mars Veterinary is not responsible for any errors in obtaining the swab sample or for any injuries or loss that may occur as a result.

Many countries and provinces have breed-specific ordinances and laws that may require special handling or prohibit the ownership of some dogs with a particular breed in their genetic background. **Wisdom Panel** is not intended to be used by regulatory or animal control officials to determine whether a particular breed is legislated or banned in a particular country or province. Nor is **Wisdom Panel** intended to be used in any judicial proceedings. Rather, it is intended to be used as a tool or resource in determining a dog's genetic history. Neither Mars Veterinary nor any related company is responsible for compliance or notification regarding these matters.

Use of the tests acknowledges consent that Mars Veterinary may use any portion of the leftover sample, as well as the data collected, for research and development purposes only.

\*This code is good for one-time use, on [wisdompanel.com](http://wisdompanel.com) only. It cannot be combined with any other promotions or discounts and cannot be used on/in any other retailer site(s) or storefronts.





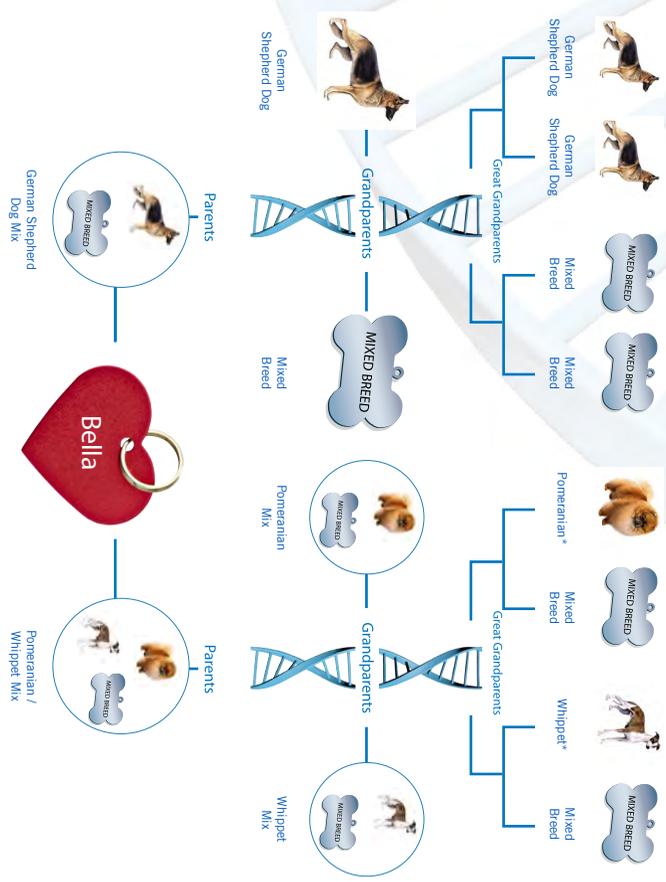
## STATEMENT OF AUTHENTICATION

Owner's name: **Mary Smith**

Dog's name: **Bella**

Date: **January 6, 2014**

This certifies the authenticity of Bella's canine genetic background as determined following careful analysis of more than 300 genetic markers using *Wisdom Panel*. The purebred dog breed signature matches included in this analysis are those that were detected in the last three generations of Bella's ancestry using the proprietary breed detection algorithm at Mars Veterinary.



*Cynthia Cole*

**Dr. Cynthia Cole DVM, PhD, DACVCP**

Research & Development Director

**Bella is a German Shepherd  
Dog, Pommeranian, Whippet Mix**

