

# Wisdom Panel<sup>®</sup> 2.5

## Congratulations!

Buddy is a Chihuahua, Miniature Shorthaired Dachshund, German Shepherd (White Swiss Shepherd), Papillon, Pekingese Mix

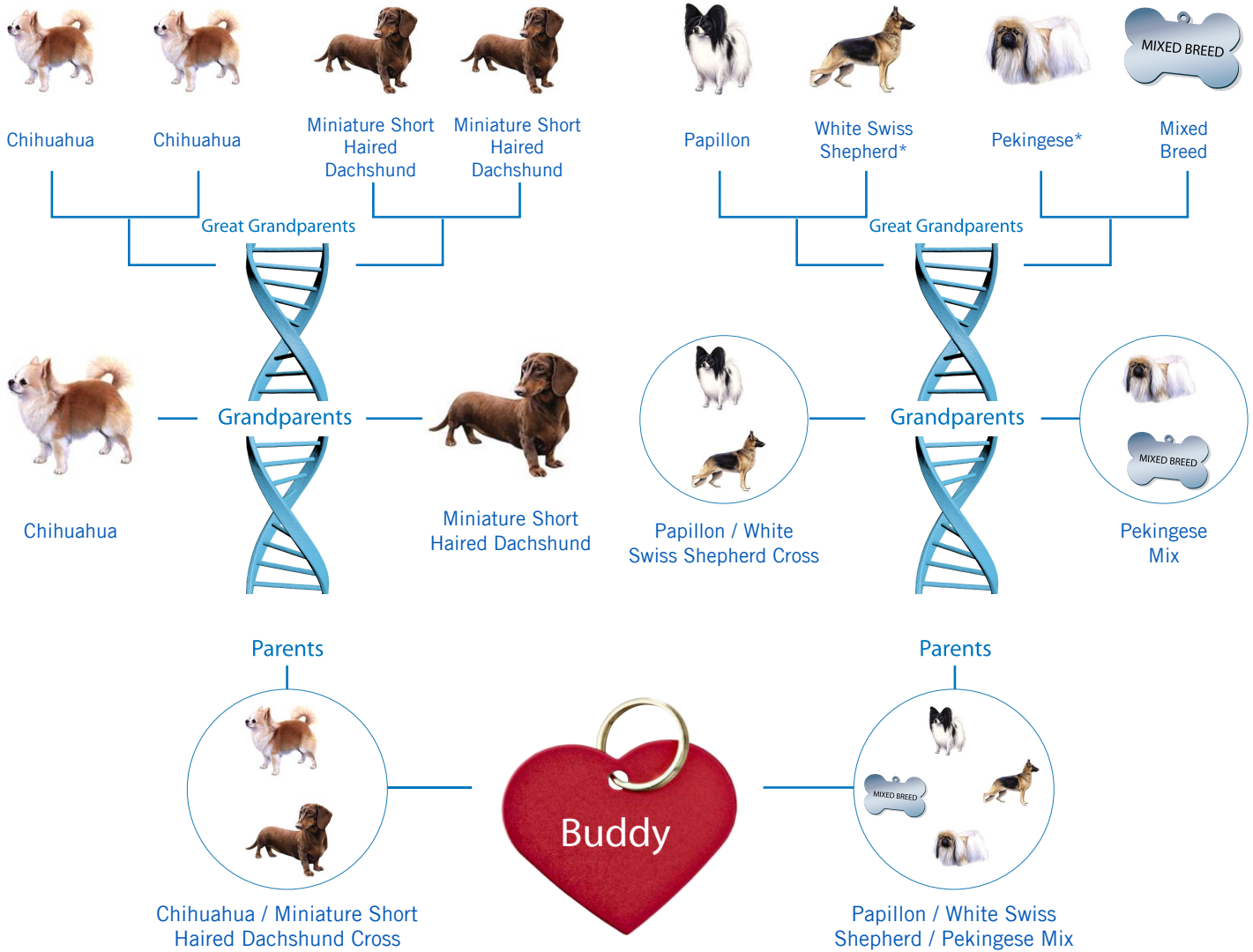
In the following pages, you will learn about:

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



### YOU HAVE A CHIHUAHUA, MINIATURE SHORTHAIRED DACHSHUND, GERMAN SHEPHERD (WHITE SWISS SHEPHERD), PAPILLON, PEKINGESE 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 Buddy. 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.



# CHIHUAHUA

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:**

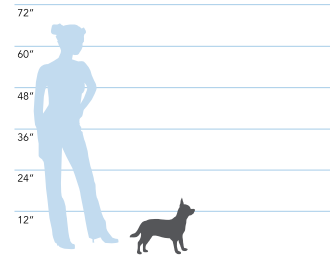
6 - 9 in

**WEIGHT (SHOW):**

2 - 7.5 lb

**WEIGHT (PET):**

2 - 9 lb



**EARS**



**MUZZLE**

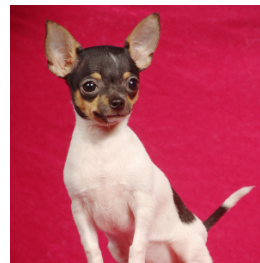


**TAIL**



The Chihuahua is one of the most ancient of dog breeds, with its origins dating back to the Mayan civilization. The breed is believed to have descended from the ancient Techichi, a dog that played an important role in both the Toltec and Aztec cultures. Some believe that the Chihuahua is a result of the crossing of the Techichi and the Chinese Crested, which came to South America from Alaska. Due to the destruction of the ancient civilizations, the breed faced extinction. However, remnants of the breed survived in Mexico and the Chihuahua was introduced to the United States in 1898. The Chihuahua was recognized as an official breed in 1904 by the American Kennel Club and by 1915, thirty Chihuahuas were registered in the States with that number jumping to over 25,000 by the early seventies.

The Chihuahua has a vast amount of variation partly due to the fact that any color or combination is permitted in the breed standard. The coat comes in either long or short hair, with traits including dark masks, merle, and white markings. The colors range from blacks to various silver and fawn shades.



**Do You Recognize Any of These Chihuahua Traits In Buddy?**

- Alert, active, and often playful dogs.
- Responds well to reward-based training using treats or favorite toys.
- Small size makes it easy for them to live in smaller places such as apartments.
- May be suspicious of strangers or bark at other dogs when intimidated by their size.



# MINIATURE SHORTHAIRED DACHSHUND

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:**

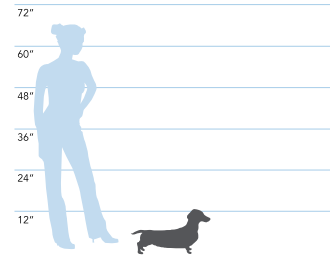
5 - 7 in

**WEIGHT (SHOW):**

4 - 11 lb

**WEIGHT (PET):**

5 - 13 lb



**EARS**



**MUZZLE**

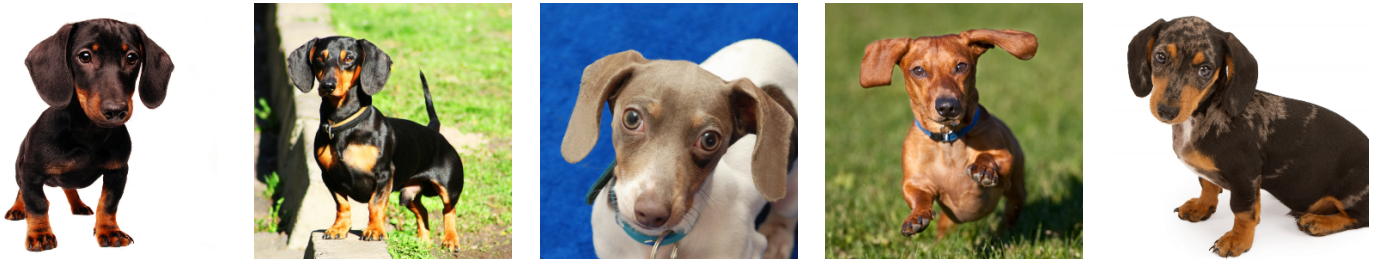


**TAIL**



The Dachshund, also known as the “hot dog” or “wiener dog,” dates back to the fifteenth century. Many accept the theory that the breed originated in Germany, although there is evidence that suggests that the breed may also have been present in Greece, Egypt, China and Mexico. The Dachshund was originally developed to hunt badgers, but they are also well-suited for hunting larger game. In 1888 the German Dachshund Club was founded and a breed standard was developed in an effort to promote a dog that was as beautiful as it was intelligent. The miniature short-haired variety is believed to have resulted from crossbreeding with toy terriers and miniature pinschers. The breed was introduced to the United States in 1885 and received American Kennel Club recognition at that time.

The Miniature Shorthaired Dachshund has a variety of coat colors with solid or bicolor combinations of light and dark black, red and tan shades. The brindle and dapple patterns are also sometimes seen in this breed as well as blue eyes.



**Do You Recognize Any of These Miniature Shorthaired Dachshund Traits In Buddy?**

- Alert, lively and active dogs.
- Because of their background as hunting dogs may engage in behaviors such as barking, scratching at the ground or digging and chasing wildlife.
- Enjoy activities that take advantage of its keen sense of smell like earthdog trials and both outdoor and indoor tracking. Many retrieve tennis balls.
- May be suspicious or fearful of strangers, in some cases as a way to avoid discomfort from being picked up due to their long-backed body.



# GERMAN SHEPHERD (WHITE SWISS SHEPHERD)

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:**

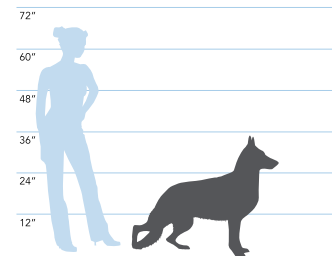
22 - 26 in

**WEIGHT (SHOW):**

48 - 89 lb

**WEIGHT (PET):**

48 - 97 lb



**EARS**



**MUZZLE**

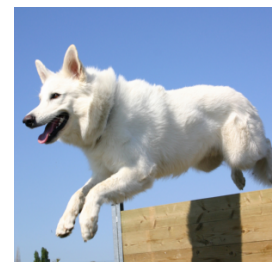
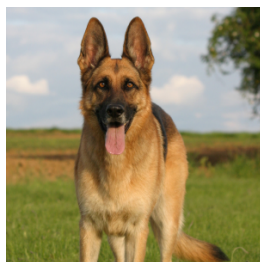
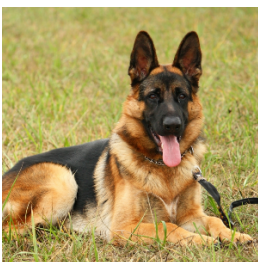


**TAIL**



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. The German Shepherd was first recognised by the AKC in 1908. The white coated variant was removed from the main breed standard in 1968, and was conserved by breeders in Switzerland which developed the breed seen today. In some countries this is called the White Swiss Shepherd or the Berger Blanc Suisse. Due to its shared ancestry with the German Shepherd lines, and the nature of genetics, it is possible that some German Shepherd signals are reported as White German Shepherd in the ancestry chart; especially in a white mixed breed. However, the size, confirmation and behavior is the same, so this is not surprising.

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. The White German Shepherd variant can be white to shades of biscuit and cream. The coat comes in long and short varieties.



**Do You Recognize Any of These German Shepherd (White Swiss Shepherd) Traits In Buddy?**

- 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.



# PAPILLON

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:**

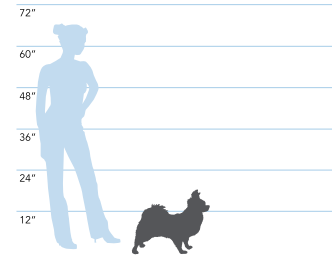
8 - 11 in

**WEIGHT (SHOW):**

4 - 10 lb

**WEIGHT (PET):**

4 - 12 lb



**EARS**



**MUZZLE**

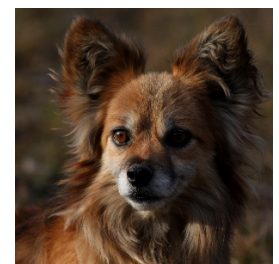


**TAIL**



One of the oldest Toy breeds, the Papillon can be traced back almost 700 years when Marco Polo opened up a trading route between Asia and Europe, providing a path by which the small breed was transported from China to Italy. Italians brought the drop-eared variety of the breed to countries such as France and Spain, where the nobility became enamored of the tiny, personable dogs for their friendliness, trainability and light weight. The breed became most popular in French courts, where they were named Papillon (French for “butterfly”). They were frequently featured in artworks alongside their owners. Until 1923, the Papillon still predominantly consisted of the drop-eared variety, but around this time, crossbreeding with the Pomeranian resulted in an erect-eared Papillon. Because of the dominance of the trait of erect ears, breeders were successful in creating the hybrid, and the popularity of the erect-eared Papillon skyrocketed. The Papillon was recognized by the American Kennel Club in 1935.

The Papillon is always particolored with any solid color and white, and the color tends to be around the ears and eyes. Like its namesake, the butterfly, the Papillon's markings also tend to be symmetrical. The Papillon may also have a black mask.



**Do You Recognize Any of These Papillon Traits In Buddy?**

- Intelligent, athletic, playful, and energetic dogs that seem to be quick learners.
- Their tendency to bark makes them good watchdogs.
- Enjoy reward-based training and as such enjoy dog sports such as agility, tracking, herding, musical canine freestyle, rally and competitive obedience.
- They can be wary or shy around strangers and may require careful socialization to prevent or reduce defensive aggressive tendencies.



# PEKINGESE



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:**

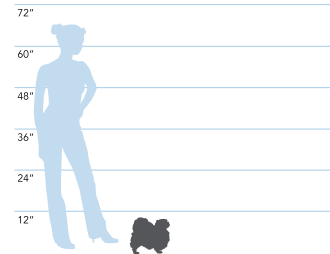
7 - 8 in

**WEIGHT (SHOW):**

5.5 - 12 lb

**WEIGHT (PET):**

6 - 15 lb



**EARS**



**MUZZLE**

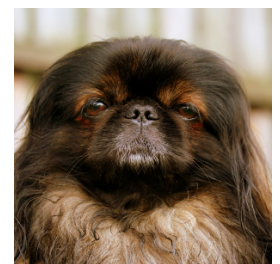


**TAIL**



The history of the Pekingese dates back as far as 2,000 years to ancient China. They were bred and established by the T'ang Dynasty in the eighth century and are one of the oldest breeds of dogs in existence today. The Pekingese were dogs of nobility and, for centuries, only members of the Chinese Imperial Palace could own them. In fact, Chinese custom demanded that commoners bow in the presence of the Pekingese. Custom also specified that the dog be sacrificed at the time of his master's death to protect him in the afterlife. In 1860, during the Second Opium War, British troops invaded the Forbidden City and wound up with five Pekingese dogs. The five dogs were bequeathed to various British nobility, including Queen Victoria. An official standard for the Pekingese was composed in 1898 and the Pekingese Club of England was founded in 1904. The American Kennel Club first recognized the breed in 1906, eight years after its first recorded entry into the United States.

The Pekingese breed standard allows all colors and markings, though these include black, black and tan, biscuit, cream, fawn, sable, gray, red, white and red brindle (red with shaded stripes). White markings are possible. The black mask is a common trait in this breed.



**Do You Recognize Any of These Pekingese Traits In Buddy?**

- Alert, calm, and intelligent dogs. Need regular activity, however require less exercise than other breeds.
- Stubborn tendencies may be lessened by using reward-based training involving small treats and favorite toys.
- They tend to bark. They can be wary around strangers and may require careful socialization to prevent or reduce defensive aggressive tendencies.
- May be intimidated by other dogs, causing defensive barking leading to confrontations.





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

A portion of Buddy'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.



Detection Threshold





## 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

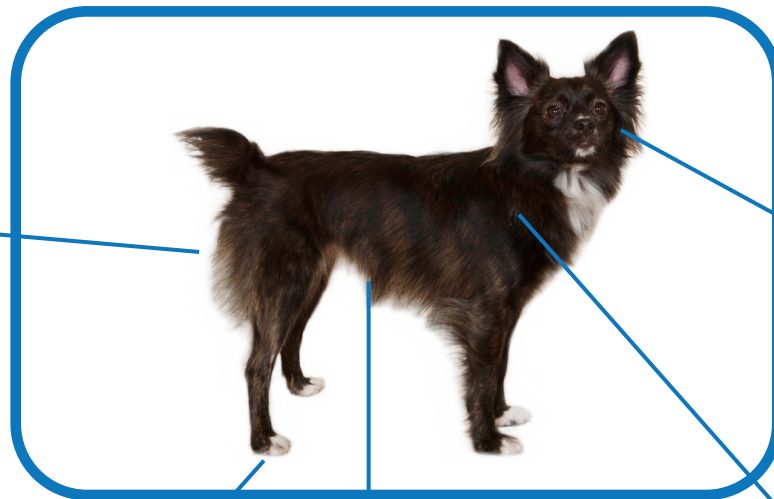
The discovery of the mutation of the multi-drug resistant gene (MDR1) and its effects on multi-drug sensitivity in dogs, was made by Washington State University. It is a patent-protected diagnostic test offered by Washington State University that has been licensed to Mars Veterinary for use in the *Wisdom 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 Buddy's ancestry and the genetic markers analyzed by **Wisdom Panel**, as well as the information provided that Buddy is **male** and neutered, we have calculated the likely weight that Buddy 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.

- The adult weight is predicted to be between 15 - 27 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 Buddy'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 Buddy. 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.

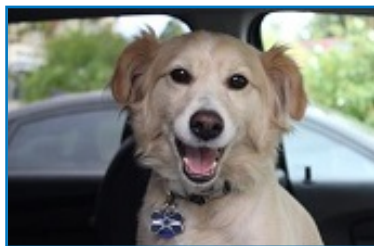
Our computer used information from over 200 breeds, types and varieties from our breed database to fill these potential pedigrees. For each of the millions of combinations of ancestry trees built and considered, the computer gave each a score representing how well that selected combination of breeds 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:  
FF5024481WI**



### 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: **William Lorensen**

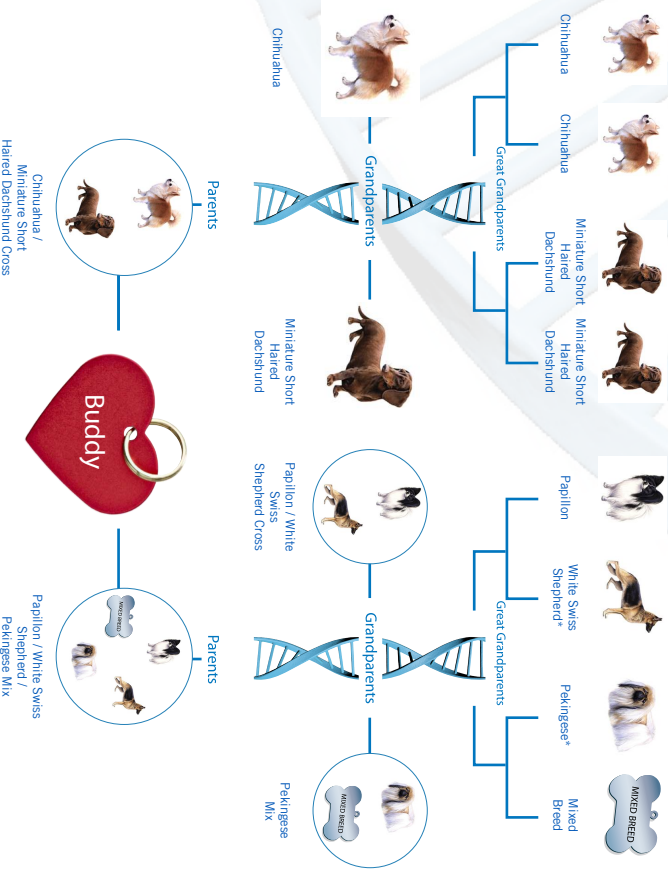
Dog's name: **Buddy**

Date: **February 4, 2016**

This certifies the authenticity of Buddy'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 Buddy's ancestry using the proprietary breed detection algorithm at Mars Veterinary.

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

Research & Development Director



**Buddy is a Chihuahua, Miniature Shorthaired  
Dachshund, German Shepherd (White  
Swiss Shepherd), Papillon, Pekingese Mix**

