

## Coat Color and Trait Certificate

**Call Name:** Ranger  
**Registered Name:** Tanasi's Who Was That Masked Man  
**Breed:** Australian Shepherd  
**Sex:** Male  
**DOB:** Sept. 2016

**Laboratory #:** 58903  
**Registration #:** DN47624002  
**Certificate Date:** Dec. 27, 2017

This canine's DNA showed the following genotype(s):

Coat Color/Trait Test	Gene	Genotype	Interpretation
A Locus (Agouti)	ASIP	a <sup>t</sup> /a <sup>t</sup>	Tricolor, black and tan
B Locus (Brown)	TYRP1	B/b	Black coat, nose and foot pads (carries brown)
Cu Locus (Curly Hair)	KRT71	Cu/Cu	Straight coat
D Locus (Dilute)	MLPH	D/D	Non dilute
E Locus (Yellow/Red)	MC1R	E/E	Black
E <sup>g</sup> Locus (Grizzle, Afghan Hound Type)	MC1R	N/N	No grizzle
E <sup>m</sup> Locus (Melanistic Mask)	MC1R	E <sup>m</sup> /N	Melanistic mask (carrier)
H Locus (Harlequin, Great Dane Type)	PSMB7	h/h	No harlequin
Hr Locus (FOXI3 Hairless Gene Test, Mexican Hairless, Peruvian Hairless and Chinese Crested Type)	FOXI3	hr/hr	Coated
IC Locus (Improper Coat/Furnishings)	RSPO2	IC/IC	No furnishings, improper coat
K Locus (Dominant Black)	CBD103	k <sup>y</sup> /k <sup>y</sup>	Agouti expression allowed
L Locus (Long Hair/Fluffy)	FGF5	Lh/Lh	Longhaired
M Locus (Merle)	PMEL	m/m	Non merle
S Locus (White Spotting, Parti, or Piebald)	MITF	S/S	No white spotting, flash, parti, or piebald
SD Locus (Shedding)	MC5R	sd/SD	Moderate shedding
T Locus (Natural Bobtail)	T	t/T	Bobtail

### Interpretation:

This dog carries two copies of **a<sup>t</sup>** which results in tan points and can also present as a black and tan or tricolor coat color. However, this dog's coat color is also dependent on the E, K, and B genes. The tan point coat color is only expressed if the dog is also E/E or E/e at the E locus and k<sup>y</sup>/k<sup>y</sup> at the K locus. This dog will pass on **a<sup>t</sup>** to 100% of its offspring.

This dog carries one copy of **B** and at least one copy of **b** at the **b<sup>c</sup>**, **b<sup>d</sup>** or **b<sup>s</sup>** locus making the overall B locus genotype of this dog **B/b**. The overall B locus genotype for a dog is determined by the combination of the

genotypes at the **b<sup>c</sup>**, **b<sup>d</sup>**, and **b<sup>s</sup>** loci. The **b<sup>c</sup>**, **b<sup>d</sup>**, and **b<sup>s</sup>** variants confer brown coat, nose, and foot pads when at least one of these DNA changes is present on both genes of the dog at the B locus. If the dog has one or no copies of **b** then the dog will have a black coat, nose, and foot pads. However, this dog's coat color is also dependent on the E, K, and A genes. This dog will pass on **B** to 50% of its offspring and **b** to 50% of its offspring.

This dog carries two copies of **Cu** which results in a straight coat. However, the overall coat type of this dog is dependent on the combination of this dog's genotypes at the L, Cu, and IC loci. This dog will pass **Cu** on to 100% of its offspring.

This dog carries two copies of **D** which does not result in the "dilution" or lightening of the black and yellow/red pigments that produce the dog's coat color. The base coat color of this dog will be primarily determined by the E, K, A, and B genes. This dog will pass on **D** to 100% of its offspring.

This dog carries two copies of **E** which allows for the production of black pigment. However, this dog's coat color is also dependent on the K, A, and B genes. This dog will pass on **E** to 100% of its offspring.

This dog carries two copies of **N** which does not result in a grizzle coat color pattern. This dog will pass on **N** to 100% of its offspring.

This dog carries one copy of **E<sup>m</sup>** and one copy of **N** which results in a melanistic mask on the muzzle of the dog. However, a melanistic mask may be unrecognizable on a dog with a dark coat color. This dog will pass on **E<sup>m</sup>** to 50% of its offspring and **N** to 50% of its offspring.

This dog carries two copies of **h** and will not have a harlequin coat color. The dog will pass on **h** to 100% of its offspring.

This dog carries two copies of the recessive **hr** allele which results in a coated dog. This dog will pass on the **hr** allele to 100% of its offspring.

This dog carries two copies of **IC** and will therefore have no furnishings (improper coat). However, the overall coat type of this dog is dependent on the combination of this dog's genotypes at the L, Cu, and IC loci. This dog will pass **IC** (improper coat) on to 100% of its offspring and can produce puppies with improper coat if bred with a dog that carries one copy (**F/IC**) or two copies (**IC/IC**) of the mutation for improper coat.

This dog carries two copies of **k<sup>y</sup>** which allows for the expression of the agouti gene (A locus) which can result in a variety of coat colors including sable/fawn, tricolor, tan points, black or brown. However, this dog's coat color is dependent on its genotypes at the E, A and B genes. This dog will pass on **k<sup>y</sup>** to 100% of its offspring.

This dog carries two copies of **Lh** which results in long hair. However, the overall coat type of this dog is dependent on the combination of this dog's genotypes at the L, Cu, and IC loci. This dog will pass **Lh** on to 100% of its offspring.

This dog carries two copies of **m** and, therefore, does not have a merle coat color. This dog will pass on **m** to 100% of its offspring.

This dog carries two copies of **S** which results in a solid coat with no white spotting, flash, parti, or piebald coat color. This dog will pass on one copy of **S** to 100% of its offspring.

This dog carries one copy of **sd** and one copy of **SD** which has been associated with moderate shedding. However, the overall degree of shedding for this dog is dependent on the combination of this dog's genotypes at the SD and IC loci. This dog will pass **SD** on to 50% of its offspring and **sd** on to 50% of its offspring.

This dog carries one copy of the dominant **T** allele and one copy of the recessive **t** allele which produces a natural bobtail. This dog will pass on the **T** allele to 50% of its offspring and the **t** allele to 50% of its offspring.

Paw Print Genetics® has genetic counseling available to you at no additional charge to answer any questions about these test results, their implications and potential outcomes in breeding this dog.



**Christina J Ramirez, PhD, DVM, DACVP**  
Medical Director



**Casey R Carl, DVM**  
Associate Medical Director

Normal results do not exclude inherited mutations not tested in these or other genes that may cause medical problems or may be passed on to offspring. These tests were developed and their performance determined by Paw Print Genetics®. This laboratory has established and verified the tests' accuracy and precision. Because all tests performed are DNA-based, rare genomic variations may interfere with the performance of some tests producing false results. If you think these results are in error, please contact the laboratory immediately for further evaluation. In the event of a valid dispute of results claim, Paw Print Genetics will do its best to resolve such a claim to the customer's satisfaction. If no resolution is possible after investigation by Paw Print Genetics with the cooperation of the customer, the extent of the customer's sole remedy is a refund of the fee paid. In no event shall Paw Print Genetics be liable for indirect, consequential or incidental damages of any kind. Any claim must be asserted within 60 days of the report of the test results.