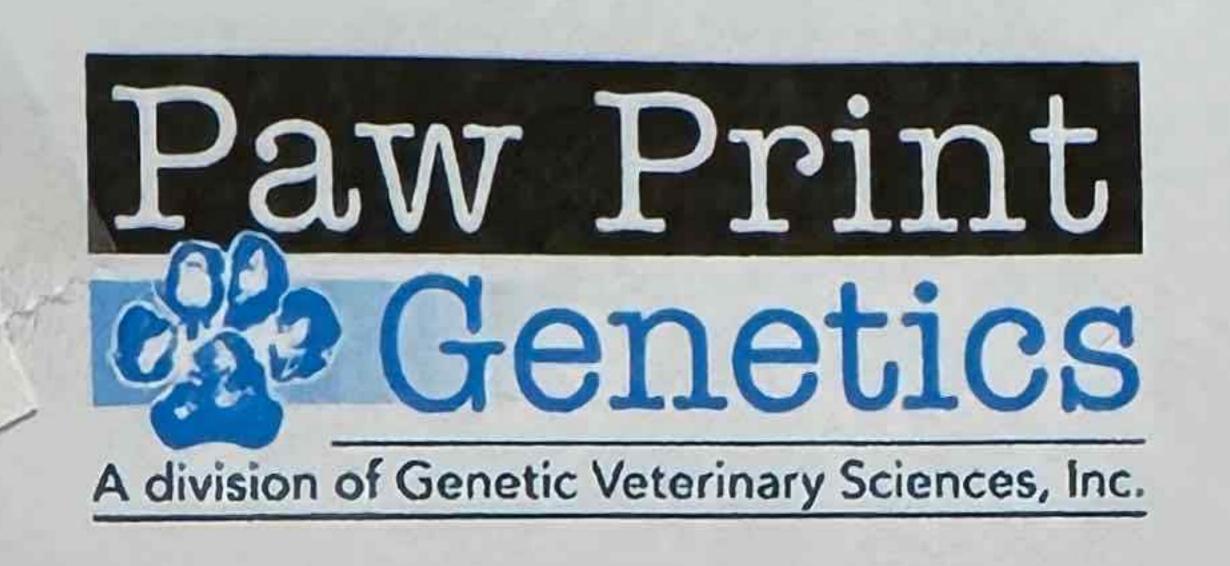
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## Coat Color and Trait Certificate

Call Name:

Laboratory #:

383136

Registered Name:

Registration #:

Breed:

Bernedoodle

Certificate Date:

Feb. 3, 2023

Sex:

DOB:

Female Dec. 2022

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

| Coat Color/Trait Test   | Gene       | Genotype | Interpretation                         |
|-------------------------|------------|----------|--|
| Chondrodysplasia (CDPA) | CFA18 FGF4 | cd/cd    | No Leg Shortening Associated with CDPA |
| I Locus (Intensity)     | MFSD12     | 1/1      | Normal intensity                       |
| M Locus (Merle)         | PMEL       | m/m      | Non merle                              |

## Interpretation:

Two genetic mutations are associated with shortened legs in dogs. Both mutations consist of copied sections (duplication) of the canine FGF4 gene (called an FGF4-retrogene) that have been inserted into two aberrant locations in the genome; one in chromosome 12 (CFA12 FGF4; associated with CDDY and IVDD risk) and one in chromosome 18 (CFA18 FGF4; associated with chondrodysplasia [CDPA], but not associated with IVDD). Appropriate breeding decisions regarding dogs which have inherited the CFA12 FGF4 mutation (WT/M or M/M) need to address both the potential loss of genetic diversity in a population which would occur if dogs with this mutation were prohibited from breeding as well as the loss of the short-legged appearance that is a defining physical characteristic for some breeds. In breeds which inherit both mutations, breeders may use genetic testing results to selectively breed for the CDPA (CFA18 FGF4) mutation while breeding away from the CDDY and IVDD risk (CFA12 FGF4) mutation to reduce IVDD risk and retain the short-legged appearance. However, the frequency of each mutation varies between breeds and, in some cases, may not be conducive to such a breeding strategy. For example, breeds with extreme limb shortening (e.g. Basset hound, Dachshund, Corgi) typically develop their appearance due to inheritance of both the CFA12 FGF4 and CFA18 FGF4 mutations. In addition, depending on the breed, offspring born without either the CFA12 FGF4 or CFA18 FGF4 mutations may display longer limbs than cohorts and, therefore, not meet specific breed standards.

This dog carries two copies of the **cd** allele which does not result in leg shortening. However, the actual leg length of the dog is a result of a combination of factors including the mutation associated with CDDY and IVDD risk (CFA12 FGF4) as well as variants in other genes. This dog will pass one copy of cd to 100% of its offspring.

This dog does not carry a copy of the i mutation and has an I locus genotype of I/I which does not result in the lightening of the light, phaeomelanin pigments that produce the dog's coat color in an e/e dog. This dog will pass one copy of I to 100% of its offspring and cannot produce i/i dogs.

This dog carries two copies of **m**, the non-merle, wild-type allele of the *PMEL* gene, and, therefore, does not have a merle coat color/pattern. This dog will pass on one copy of the **m** allele to 100% 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.