

FI

Coat Color and Trait Certificate

Call Name: Kris *Sunday Snowy* **Laboratory #:** 383137
Registered Name: - **Registration #:** -
Breed: Bernedoodle **Certificate Date:** July 20, 2023
Sex: Female
DOB: Dec. 2022

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

Coat Color/Trait Test	Gene	Genotype	Interpretation
B Locus (Brown) - b ^a , b ^c , b ^d , b ^s	TYRP1	B/b	Black coat, nose and foot pads (carries one copy of brown)
Chondrodysplasia (CDPA)	CFA18 FGF4	cd/cd	No Leg Shortening Associated with CDPA
E Locus - e (Apricot/Cream/Red/Yellow, Common Variant Found in Many Breeds)	MC1R	E/e	Black (carries yellow/red)
I Locus (Intensity)	MFSD12	I/I	Normal intensity
IC Locus (Improper Coat/Furnishings)	RSPO2	F/IC	Furnishings (improper coat carrier)
S Locus (White Spotting, Parti, or Piebald)	MITF	S/s ^P	Limited white spotting, flash, parti, or piebald (carrier)

Interpretation:

This dog carries one copy of one of the b mutations and has a B locus genotype of **B/b**. Thus, this dog typically will have a black coat, nose, and foot pads. However, this dog's coat color is dependent on the genotypes of many other genes. This dog will pass one copy of **B** to 50% of its offspring and one copy of **b** to 50% of its offspring. This dog can produce b/b offspring if bred to a dog that is also a carrier of a b mutation (B/b or b/b). Depending on the breed, b/b dogs may be referred to as brown, chocolate, liver or red.

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.