UCDAVIS VETERINARY MEDICINE
Veterinary Genetics Laboratory

LABRADOR RETRIEVER GENETIC HEALTH PANEL TEST REPORT

Provided Information:		*Case:*	**NCD227496**
Name:	**IOWA POINTING LABS SAM OF THE BLUEGRASS**	*Date Received:*	25-Sep-2023
Registration:	**SS36204602**	*Report Issue Date:*	29-Sep-2023
		Report ID:	6155-6761-7889-5082
		Verify report at www.vgl.ucdavis.edu/verify	

DOB: **06/08/2022** *Sex:* **Male** *Breed:* **Labrador Retriever** *Color:* **Yellow**

Call Name: **Sam**

	RESULT		INTERPRETATION
Centronuclear Myopathy (CNM)	**N/N**		No copies of the CNM mutation detected. Dog is normal.
Congenital Myasthenic Syndrome (CMS)	**N/N**		No copies of the CMS mutation detected. Dog is normal.
Copper Toxicosis	**ATP7A**	**7A**	The dog has the ATP7A variant and may have very low levels of hepatic copper.
	ATP7B	**N/N**	
Cystinuria Type I-A	**N/N**		No copies of the cystinuria type I-A mutation detected. Dog is normal.
Exercise Induced Collapse (EIC)	**N/N**		No copies of the EIC mutation detected. Dog is normal.
Degenerative Myelopathy (DM)	**N/N**		No copies of the DM mutation.
Hereditary Nasal Parakeratosis (HNPK)	**N/N**		No copies of the HNPK mutation detected. Dog is normal.
Hyperuricosuria	**N/N**		No copies of the hyperuricosuria mutation detected. Dog is normal.
Narcolepsy	**N/N**		Normal. Dog does not carry the Labrador narcolepsy associated variant.
Pyruvate Kinase Deficiency (PKDef)	**N/N**		No copies of the PKDef mutation. Dog is normal.
Stargardt Disease	**N/N**		Normal. No copies of the Labrador Retriever Stargardt disease variant detected.
Skeletal Dysplasia 2 (SD2)	**N/N**		No copies of the SD2 mutation detected. Dog is normal.
X-Linked Myotubular Myopathy (XLMTM)	**N**		No copy of the MTM1 mutation detected. Male is unaffected.
Progressive Rod-Cone Degeneration (PRCD)	**N/N**		Normal. Dog does not have the variant associated with PRCD.
DILUTE (D LOCUS)	**D/D**		No known dilution variants present.

Paw Print Genetics
A division of Genetic Veterinary Sciences, Inc.

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Laboratory Report

Laboratory #:	339082	**Call Name:**	Sam
Order #:	152701	**Registered Name:**	Iowa Pointing Labs Sam of the Bluegrass
Ordered By:	Carolyn Cabot	**Breed:**	Labrador Retriever
Ordered:	Nov. 29, 2022	**Sex:**	Male
Received:	Dec. 20, 2022	**DOB:**	June 2022
Reported:	Dec. 28, 2022	**Registration #:**	-

Results:

Disease	Gene	Genotype	Interpretation
Centronuclear Myopathy	*PTPLA*	WT/WT	Normal (clear)
Congenital Myasthenic Syndrome (Labrador Retriever Type)	*COLQ*	WT/WT	Normal (clear)
Copper Toxicosis (Labrador Retriever Type) ATP7A	*ATP7A*	M/Y	Carrier Male
Copper Toxicosis (Labrador Retriever Type) ATP7B	*ATP7B*	WT/WT	Normal (clear)
Exercise-Induced Collapse	*DNM1*	WT/WT	Normal (clear)
Hereditary Nasal Parakeratosis (Labrador Retriever Type)	*SUV39H2*	WT/WT	Normal (clear)
Macular Corneal Dystrophy (Labrador Retriever Type)	*CHST6*	WT/WT	Normal (clear)
Progressive Retinal Atrophy, Golden Retriever 2	*TTC8*	WT/WT	Normal (clear)
Progressive Retinal Atrophy, Progressive Rod-Cone Degeneration	*PRCD*	WT/WT	Normal (clear)
Pyruvate Kinase Deficiency (Labrador Retriever Type)	*PKLR*	WT/WT	Normal (clear)
Retinal Dysplasia/Oculoskeletal Dysplasia 1	*COL9A3*	WT/WT	Normal (clear)
Skeletal Dysplasia 2	*COL11A2*	WT/WT	Normal (clear)
Stargardt Disease	*ABCA4*	WT/WT	Normal (clear)

WT, wild type (normal); M, mutant; Y, Y chromosome (male)

Interpretation:

Molecular genetic analysis was performed for 13 specific mutations reported to be associated with disease in dogs (12 deleterious mutations and one protective mutation). We identified two normal copies of the DNA sequences in 12 of the deleterious mutations tested. Thus, this dog is not at an increased risk for the diseases associated with these 12 mutations. We identified one mutant copy of the DNA sequence for *ATP7A* on the X chromosome. Thus, this dog carries one copy of the protective mutation for Copper Toxicosis (Labrador Retriever Type) ATP7A.

Recommendations:

This dog was also tested for a genetic mutation of the canine *ATP7A* gene which partially protects against copper toxicosis in dogs that have inherited the *ATP7B* mutation described above. This dog carries one copy of the *ATP7A* gene mutation. Therefore, this dog may have a lesser risk of copper toxicosis than the risk associated with the inheritance of the *ATP7B* gene mutation alone. The *ATP7A* gene mutation is more effective at decreasing the risk

of copper toxicosis in male dogs than females. However, since multiple factors (both genetic and environmental) play a role in causing copper toxicosis, the *ATP7A* mutation is not completely protective in either sex. Note: The *ATP7A* mutation is located on the X chromosome. Since males only have a single X chromosome they can only inherit a single copy of this mutation.

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.

Helen F Smith, PhD
Associate Laboratory Director

Christina J Ramirez, PhD, DVM, DACVP
Medical Director

Paw Print Genetics® performed the tests listed on this dog. The genes/diseases reported here were selected by the client. 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. The results included in this report relate only to the items tested using the sample provided. These tests were developed and their performance determined by Paw Print Genetics. This laboratory has established and verified the test(s)' accuracy and precision with >99.9% sensitivity and specificity. The presence of mosaicism may not be detected by this test. Non-paternity may lead to unexpected results. This is not a breed identification test. Because all tests performed are DNA-based, rare genomic variations may interfere with the performance of some tests producing false results. If you think any 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.

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Coat Color and Trait Certificate

Call Name:	Sam	**Laboratory #:**	339082
Registered Name:	Iowa Pointing Labs Sam of the Bluegrass	**Registration #:**	-
Breed:	Labrador Retriever	**Certificate Date:**	Dec. 28, 2022
Sex:	Male		
DOB:	June 2022		

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

Coat Color/Trait Test	Gene	Genotype	Interpretation
D Locus (Dilute)	*MLPH*	D/D	Non-dilute (does not carry dilute)

Interpretation:

This dog does not carry any copies of the d^1 or d^2 mutations and has a D locus genotype of **D/D** which does not result in the "dilution" or lightening of the pigments that produce the dog's coat color. This dog will pass one copy of **D** to 100% of its offspring and cannot produce d/d dogs.

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