



Owner's Copy

PennHIP Report

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Patient Information

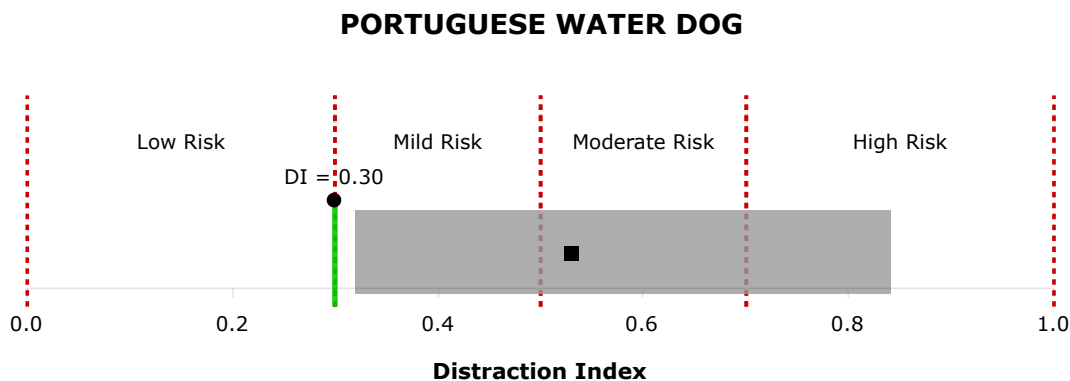
Client: Hayek, Marlene	Tattoo Num:
Patient Name: Luna	Patient ID: 40194
Reg. Name: Luna Biblos Princess	Registration Num:
PennHIP Num: 165043	Microchip Num: 900215000802400
Species: Canine	Breed: PORTUGUESE WATER DOG
Date of Birth: 28 Mar 2021	Age: 8 months
Sex: Female	Weight: 39.6 lbs/18 kgs
Date of Study: 11 Nov 2021	Date Submitted: 17 Nov 2021
Date of Report: 18 Nov 2021	

Findings

Distraction Index (DI): Right DI = 0.30, Left DI = 0.29.
 Osteoarthritis (OA): **No radiographic evidence of OA for either hip.**
 Cavitation/Other Findings: No cavitation present.

Interpretation

Distraction Index (DI): The laxity ranking is based on the hip with the greater laxity (larger DI). In this case the DI used is 0.30.
 OA Risk Category: The DI is less than or equal to 0.30. This patient is at minimal risk for hip OA.
 Distraction Index Chart:



BREED STATISTICS: This interpretation is based on a cross-section of 666 canine patients of the PORTUGUESE WATER DOG breed in the AIS PennHIP database. The gray strip represents the central 90% range of DIs (0.32 - 0.84) for the breed. The breed average DI is 0.53 (solid square). The patient DI is the solid circle (0.30).

SUMMARY: The degree of laxity (DI = 0.30) ranks the hip within the tightest 5% of DIs for the breed. This amount of hip laxity places the hip at a minimal risk to develop hip OA. **No radiographic evidence of OA for either hip.**

LUNA
Registration: N/A
Breed: Portuguese Water Dog

Sample ID: DFCFWGB
Test Date: 7/1/2021
Optimal Selection - Canine

DNA Test Report

Owner Info

First Name MARLENE	Last Name HAYEK
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Pet Info

Registered Name LUNA	Date of Birth 2/11/2021
Nickname (Call Name) LUNA	Sample ID DFCFWGB
Sex Female	Registration N/A
Country of Origin US	Microchip ID 900215000802400
Owner Reported Breed Portuguese Water Dog	Tattoo ID N/A

DNA Test Report

Genetic Diversity (Heterozygosity)

LUNA's Percentage of Heterozygosity

31%

This may make her more susceptible to genetic health complications when compared with other Portuguese Water Dogs.

Typical Range for Portuguese Water Dogs

32 - 39%

DNA Test Report

Health Conditions Known in This Breed

Genetic Condition	Gene	Risk Variant	Copies	Result
Early-onset PRA (Discovered in the Portuguese Water Dog)	CCDC66	Insertion	0	Clear
GM1 Gangliosidosis (Discovered in the Portuguese Water Dog)	GLB1	G>A	0	Clear
Progressive Rod Cone Degeneration (prcd-PRA)	PRCD	G>A	0	Clear

Other Conditions Tested

Genetic Condition	Gene	Risk Variant	Copies	Result
2,8-dihydroxyadenine (DHA) Urolithiasis	APRT	G>A	0	Clear
Acral Mutilation Syndrome	GDNF	C>T	0	Clear
Acute Respiratory Distress Syndrome	ANLN	C>T	0	Clear
Alaskan Husky Encephalopathy	SLC19A3	G>A	0	Clear
Alexander Disease	GFAP	G>A	0	Clear
Amelogenesis Imperfecta	ENAM	Deletion	0	Clear
Bandera's Neonatal Ataxia	GRM1	Insertion	0	Clear
Benign Familial Juvenile Epilepsy	LGI2	A>T	0	Clear
Canine Leukocyte Adhesion Deficiency (CLAD), type III	FERMT3	Insertion	0	Clear
Canine Multifocal Retinopathy 1	BEST1	C>T	0	Clear
Canine Multifocal Retinopathy 2	BEST1	G>A	0	Clear
Canine Multifocal Retinopathy 3	BEST1	Deletion	0	Clear
Canine Scott Syndrome	ANO6	G>A	0	Clear
Centronuclear Myopathy (Discovered in the Great Dane)	BIN1	A>G	0	Clear
Centronuclear Myopathy (Discovered in the Labrador Retriever)	PTPLA	Insertion	0	Clear
Cerebellar Ataxia	RAB24	A>C	0	Clear
Cerebellar Cortical Degeneration	SNX14	C>T	0	Clear

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Other Conditions Tested (continued)

Genetic Condition	Gene	Risk Variant	Copies	Result
Cerebellar Hypoplasia	VLDLR	Deletion	0	Clear
Cerebral Dysfunction	SLC6A3	G>A	0	Clear
Chondrodysplasia	ITGA10	C>T	0	Clear
Cleft Lip & Palate with Syndactyly	ADAMTS20	Deletion	0	Clear
Cleft Palate	DLX6	C>A	0	Clear
Collie Eye Anomaly (CEA)	NHEJ1	Deletion	0	Clear
Complement 3 Deficiency	C3	Deletion	0	Clear
Cone Degeneration (Discovered in the Alaskan Malamute)	CNGB3	Deletion	0	Clear
Cone Degeneration (Discovered in the German Shepherd Dog)	CNGA3	C>T	0	Clear
Cone Degeneration (Discovered in the German Shorthaired Pointer)	CNGB3	G>A	0	Clear
Cone-Rod Dystrophy	NPHP4	Deletion	0	Clear
Cone-Rod Dystrophy 1	PDE6B	Deletion	0	Clear
Cone-Rod Dystrophy 2	IQCB1	Insertion	0	Clear
Congenital Dyshormonogenic Hypothyroidism with Goiter (Discovered in the Shih Tzu)	SLC5A5	G>A	0	Clear
Congenital Hypothyroidism (Discovered in the Tenterfield Terrier)	TPO	C>T	0	Clear
Congenital Hypothyroidism (Discovered in the Toy Fox and Rat Terrier)	TPO	C>T	0	Clear
Congenital Myasthenic Syndrome (Discovered in the Golden Retriever)	COLQ	G>A	0	Clear
Congenital Myasthenic Syndrome (Discovered in the Jack Russell Terrier)	CHRNE	Insertion	0	Clear
Congenital Myasthenic Syndrome (Discovered in the Labrador Retriever)	COLQ	T>C	0	Clear
Congenital Myasthenic Syndrome (Discovered in the Old Danish Pointer)	CHAT	G>A	0	Clear
Congenital Stationary Night Blindness (CSNB)	RPE65	A>T	0	Clear
Craniomandibular Osteopathy	SLC37A2	C>T	0	Clear

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Other Conditions Tested (continued)

Genetic Condition	Gene	Risk Variant	Copies	Result
Cystic Renal Dysplasia and Hepatic Fibrosis	INPP5E	G>A	0	Clear
Cystinuria Type I-A	SLC3A1	C>T	0	Clear
Cystinuria Type II-A	SLC3A1	Deletion	0	Clear
Deafness and Vestibular Dysfunction (Discovered in Doberman Pinscher)	PTPRQ	Insertion	0	Clear
Degenerative Myelopathy	SOD1	G>A	0	Clear
Demyelinating Neuropathy	SBF2	G>T	0	Clear
Dental Hypomineralization	FAM20C	C>T	0	Clear
Dilated Cardiomyopathy (Discovered in the Schnauzer)	Pending	Deletion	0	Clear
Dominant Progressive Retinal Atrophy	RHO	C>G	0	Clear
Dystrophic Epidermolysis Bullosa (Discovered in the Central Asian Ovcharka)	COL7A1	C>T	0	Clear
Dystrophic Epidermolysis Bullosa (Discovered in the Golden Retriever)	COL7A1	C>T	0	Clear
Early Adult Onset Deafness For Border Collies only (Linkage test)	Pending	Insertion	0	Clear
Early Retinal Degeneration (Discovered in the Norwegian Elkhound)	STK38L	A>C	0	Clear
Early-Onset Progressive Polyneuropathy (Discovered in the Alaskan Malamute)	NDRG1	G>T	0	Clear
Early-Onset Progressive Polyneuropathy (Discovered in the Greyhound)	NDRG1	Deletion	0	Clear
Enamel Hypoplasia (Discovered in the Parson Russell Terrier)	ENAM	C>T	0	Clear
Epidermolytic Hyperkeratosis	KRT10	G>T	0	Clear
Episodic Falling Syndrome	BCAN	Insertion	0	Clear
Exercise-Induced Collapse	DNM1	G>T	0	Clear
Factor VII Deficiency	F7	G>A	0	Clear
Factor XI Deficiency	FXI	Insertion	0	Clear
Fanconi Syndrome	FAN1	Deletion	0	Clear

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Other Conditions Tested (continued)

Genetic Condition	Gene	Risk Variant	Copies	Result
Fetal Onset Neuroaxonal Dystrophy	MFN2	G>C	0	Clear
Focal Non-Epidermolytic Palmoplantar Keratoderma	KRT16	G>C	0	Clear
Generalized Progressive Retinal Atrophy (Discovered in the Schapendoes)	CCDC66	Insertion	0	Clear
Glanzmann Thrombasthenia Type I	ITGA2B	C>T	0	Clear
Glanzmann Thrombasthenia Type I (Discovered in Great Pyrenees)	ITGA2B	C>G	0	Clear
Globoid Cell Leukodystrophy (Discovered in the Irish Setter)	GALC	A>T	0	Clear
Globoid Cell Leukodystrophy (Discovered in Terriers)	GALC	A>C	0	Clear
Glycogen Storage Disease Type Ia	G6PC	G>C	0	Clear
Glycogen Storage Disease Type IIIa, (GSD IIIa)	AGL	Deletion	0	Clear
GM1 Gangliosidosis (Discovered in the Shiba)	GLB1	Deletion	0	Clear
GM2 Gangliosidosis (Discovered in the Japanese Chin)	HEXA	G>A	0	Clear
GM2 Gangliosidosis (Discovered in the Toy Poodle)	HEXB	Deletion	0	Clear
Goniodysgenesis and Glaucoma (Discovered in the Border Collie)	OLFML3	G>A	0	Clear
Hemophilia A (Discovered in Old English Sheepdog)	FVIII	C>T	0	Clear
Hemophilia A (Discovered in the Boxer)	FVIII	C>G	0	Clear
Hemophilia A (Discovered in the German Shepherd Dog - Variant 1)	FVIII	G>A	0	Clear
Hemophilia A (Discovered in the German Shepherd Dog - Variant 2)	FVIII	G>A	0	Clear
Hemophilia A (Discovered in the Havanese)	FVIII	Insertion	0	Clear
Hemophilia B	FIX	G>A	0	Clear
Hemophilia B (Discovered in the Airedale Terrier)	FIX	A>T	0	Clear
Hemophilia B (Discovered in the Lhasa Apso)	FIX	Deletion	0	Clear
Hereditary Ataxia (Discovered in the Norwegian Buhund)	KCNIP4	T>C	0	Clear

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Other Conditions Tested (continued)

Genetic Condition	Gene	Risk Variant	Copies	Result
Hereditary Elliptocytosis	SPTB	C>T	0	Clear
Hereditary Footpad Hyperkeratosis	FAM83G	G>C	0	Clear
Hereditary Nasal Parakeratosis (Discovered in the Greyhound)	SUV39H2	Deletion	0	Clear
Hereditary Nasal Parakeratosis (Discovered in the Labrador Retriever)	SUV39H2	A>C	0	Clear
Hereditary Vitamin D-Resistant Rickets Type II	VDR	Deletion	0	Clear
Hyperekplexia or Startle Disease	SLC6A5	G>T	0	Clear
Hyperuricosuria	SLC2A9	G>T	0	Clear
Hypocatalasia	CAT	G>A	0	Clear
Hypomyelination	FNIP2	Deletion	0	Clear
Hypophosphatasia	Pending	T>G	0	Clear
Ichthyosis (Discovered in the American Bulldog)	NIPAL4	Deletion	0	Clear
Ichthyosis (Discovered in the Great Dane)	SLC27A4	G>A	0	Clear
Intestinal Cobalamin Malabsorption (Discovered in the Beagle)	CUBN	Deletion	0	Clear
Intestinal Cobalamin Malabsorption (Discovered in the Border Collie)	CUBN	Deletion	0	Clear
Intestinal Cobalamin Malabsorption (Discovered in the Komondor)	CUBN	G>A	0	Clear
Juvenile Encephalopathy (Discovered in the Parson Russell Terrier)	Pending	Deletion	0	Clear
Juvenile Laryngeal Paralysis and Polyneuropathy	RAB3GAP1	Deletion	0	Clear
Juvenile Myoclonic Epilepsy	DIRAS1	Deletion	0	Clear
L-2-Hydroxyglutaric Aciduria	L2HGDH	T>C	0	Clear
L-2-Hydroxyglutaric Aciduria (Discovered in the Westie)	Pending	Insertion	0	Clear
Lagotto Storage Disease	ATG4D	G>A	0	Clear
Lamellar Ichthyosis	TGM1	Insertion	0	Clear

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Other Conditions Tested (continued)

Genetic Condition	Gene	Risk Variant	Copies	Result
Lethal Acrodermatitis (Discovered in the Bull Terrier)	MKLN1	A>C	0	Clear
Ligneous Membranitis	PLG	T>A	0	Clear
Lung Developmental Disease (Discovered in the Airedale Terrier)	LAMP3	C>T	0	Clear
Macrothrombocytopenia	TUBB1	G>A	0	Clear
May-Hegglin Anomaly	MYH9	G>A	0	Clear
MDR1 Medication Sensitivity	MDR1/ABCB1	Deletion	0	Clear
Microphthalmia (Discovered in the Soft-Coated Wheaten Terrier)	RBP4	Deletion	0	Clear
Mucopolysaccharidosis Type IIIA (Discovered in the Dachshund)	SGSH	C>A	0	Clear
Mucopolysaccharidosis Type IIIA (Discovered in the New Zealand Huntaway)	SGSH	Insertion	0	Clear
Mucopolysaccharidosis Type VII (Discovered in the Brazilian Terrier)	GUSB	C>T	0	Clear
Mucopolysaccharidosis Type VII (Discovered in the German Shepherd Dog)	GUSB	G>A	0	Clear
Muscular Dystrophy (Discovered in the Cavalier King Charles Spaniel)	Dystrophin	G>T	0	Clear
Muscular Dystrophy (Discovered in the Golden Retriever)	Dystrophin	A>G	0	Clear
Muscular Dystrophy (Discovered in the Landseer)	COL6A1	G>T	0	Clear
Muscular Dystrophy (Discovered in the Norfolk Terrier)	Dystrophin	Deletion	0	Clear
Muscular Hypertrophy (Double Muscling)	MSTN	T>A	0	Clear
Musladin-Lueke Syndrome	ADAMTSL2	C>T	0	Clear
Myeloperoxidase Deficiency	MOP	C>T	0	Clear
Myotonia Congenita	CLCN1	Insertion	0	Clear
Myotonia Congenita (Discovered in the Labrador Retriever)	CLCN1	T>A	0	Clear
Myotonia Congenita (Discovered in the Miniature Schnauzer)	CLCN1	C>T	0	Clear
Myotubular Myopathy	MTM1	A>C	0	Clear

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Other Conditions Tested (continued)

Genetic Condition	Gene	Risk Variant	Copies	Result
Narcolepsy (Discovered in the Dachshund)	HCRTR2	G>A	0	Clear
Narcolepsy (Discovered in the Labrador Retriever)	HCRTR2	G>A	0	Clear
Nemaline Myopathy	NEB	C>A	0	Clear
Neonatal Cerebellar Cortical Degeneration	SPTBN2	Deletion	0	Clear
Neonatal Encephalopathy with Seizures	ATF2	T>G	0	Clear
Neuroaxonal Dystrophy	TECPR2	C>T	0	Clear
Neuroaxonal Dystrophy (Discovered in the Papillon)	PLA2G6	G>A	0	Clear
Neuroaxonal Dystrophy (Discovered in the Rottweiler)	VPS11	A>G	0	Clear
Neuronal Ceroid Lipofuscinosis 1	PPT1	Insertion	0	Clear
Neuronal Ceroid Lipofuscinosis 12 (Discovered in the Australian Cattle Dog)	ATP13A2	C>T	0	Clear
Neuronal Ceroid Lipofuscinosis 7	MFSD8	Deletion	0	Clear
Neuronal Ceroid Lipofuscinosis 8 (Discovered in the Alpine Dachsbracke)	CLN8	Deletion	0	Clear
Neuronal Ceroid Lipofuscinosis 8 (Discovered in the Australian Shepherd)	CLN8	G>A	0	Clear
Neuronal Ceroid Lipofuscinosis 8 (Discovered in the English Setter)	CLN8	T>C	0	Clear
Neuronal Ceroid Lipofuscinosis 8 (Discovered in the Saluki)	CLN8	Insertion	0	Clear
Obesity risk (POMC)	POMC	Deletion	0	Clear
Osteochondrodysplasia	SLC13A1	Deletion	0	Clear
Osteochondromatosis (Discovered in the American Staffordshire Terrier)	EXT2	C>A	0	Clear
Osteogenesis Imperfecta (Discovered in the Beagle)	COL1A2	C>T	0	Clear
Osteogenesis Imperfecta (Discovered in the Dachshund)	SERPINH1	T>C	0	Clear
P2RY12-associated Bleeding Disorder	P2RY12	Deletion	0	Clear
Paroxysmal Dyskinesia	PIGN	C>T	0	Clear

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Other Conditions Tested (continued)

Genetic Condition	Gene	Risk Variant	Copies	Result
Persistent Müllerian Duct Syndrome	AMHR2	C>T	0	Clear
Phosphofruktokinase Deficiency	PFKM	G>A	0	Clear
Polycystic Kidney Disease	PKD1	G>A	0	Clear
Prekallikrein Deficiency	KLKB1	T>A	0	Clear
Primary Ciliary Dyskinesia	CCDC39	C>T	0	Clear
Primary Ciliary Dyskinesia (Discovered in the Alaskan Malamute)	NME5	Deletion	0	Clear
Primary Lens Luxation	ADAMTS17	G>A	0	Clear
Primary Open Angle Glaucoma (Discovered in Basset Fauve de Bretagne)	ADAMTS17	G>A	0	Clear
Primary Open Angle Glaucoma (Discovered in Petit Basset Griffon Vendeen)	ADAMTS17	Insertion	0	Clear
Primary Open Angle Glaucoma and Lens Luxation (Discovered in Chinese Shar-Pei)	ADAMTS17	Deletion	0	Clear
Progressive Early-Onset Cerebellar Ataxia	SEL1L	T>C	0	Clear
Progressive Retinal Atrophy (Discovered in the Basenji)	SAG	T>C	0	Clear
Progressive Retinal Atrophy (Discovered in the Golden Retriever - GR-PRA1 variant)	SLC4A3	Insertion	0	Clear
Progressive Retinal Atrophy (Discovered in the Lhasa Apso)	IMPG2	Insertion	0	Clear
Progressive Retinal Atrophy (Discovered in the Papillon and Phalène)	CNGB1	Deletion	0	Clear
Progressive Retinal Atrophy (Discovered in the Shetland Sheepdog - BBS2 variant)	Pending	G>C	0	Clear
Progressive Retinal Atrophy (Discovered in the Shetland Sheepdog - CNGA1 variant)	CNGA1	Deletion	0	Clear
Progressive Retinal Atrophy (Discovered in the Swedish Vallhund)	MERTK	Insertion	0	Clear
Progressive Retinal Atrophy 1 (Discovered in the Italian Greyhound)	Pending	G>A	0	Clear
Progressive Retinal Atrophy Type III	FAM161A	Insertion	0	Clear
Protein Losing Nephropathy	NPHS1	G>A	0	Clear

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Other Conditions Tested (continued)

Genetic Condition	Gene	Risk Variant	Copies	Result
Pyruvate Dehydrogenase Phosphatase 1 Deficiency	PDP1	C>T	0	Clear
Pyruvate Kinase Deficiency (Discovered in the Basenji)	PKLR	Deletion	0	Clear
Pyruvate Kinase Deficiency (Discovered in the Beagle)	PKLR	G>A	0	Clear
Pyruvate Kinase Deficiency (Discovered in the Pug)	PKLR	T>C	0	Clear
Pyruvate Kinase Deficiency (Discovered in the West Highland White Terrier)	PKLR	Insertion	0	Clear
QT Syndrome	KCNQ1	C>A	0	Clear
Renal Cystadenocarcinoma and Nodular Dermatofibrosis	FLCN	A>G	0	Clear
Rod-Cone Dysplasia 1	PDE6B	G>A	0	Clear
Rod-Cone Dysplasia 1a	PDE6B	Insertion	0	Clear
Rod-Cone Dysplasia 3	PDE6A	Deletion	0	Clear
Sensory Ataxic Neuropathy	tRNATyr	Deletion	0	Clear
Sensory Neuropathy	FAM134B	Insertion	0	Clear
Severe Combined Immunodeficiency	PRKDC	G>T	0	Clear
Severe Combined Immunodeficiency (Discovered in Frisian Water Dogs)	RAG1	G>T	0	Clear
Shaking Puppy Syndrome (Discovered in the Border Terrier)	Pending	G>A	0	Clear
Skeletal Dysplasia 2	COL11A2	G>C	0	Clear
Spinocerebellar Ataxia (Late-Onset Ataxia)	CAPN1	G>A	0	Clear
Spinocerebellar Ataxia with Myokymia and/or Seizures	KCNJ10	C>G	0	Clear
Spondylocostal Dysostosis	HES7	Deletion	0	Clear
Spongy Degeneration with Cerebellar Ataxia (Discovered in Belgian Malinois - SDCA1)	KCNJ10	T>C	0	Clear
Spongy Degeneration with Cerebellar Ataxia (Discovered in Belgian Malinois - SDCA2)	ATP1B2	Insertion	0	Clear

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Other Conditions Tested (continued)

Genetic Condition	Gene	Risk Variant	Copies	Result
Stargardt Disease (Discovered in the Labrador Retriever)	ABCA4	Insertion	0	Clear
Trapped Neutrophil Syndrome	VPS13B	Deletion	0	Clear
von Willebrand's Disease, type 1	VWF	G>A	0	Clear
von Willebrand's Disease, type 2	VWF	T>G	0	Clear
von Willebrand's Disease, type 3 (Discovered in the Kooiker Hound)	VWF	G>A	0	Clear
von Willebrand's Disease, type 3 (Discovered in the Scottish Terrier)	VWF	Deletion	0	Clear
von Willebrand's Disease, type 3 (Discovered in the Shetland Sheepdog)	VWF	Deletion	0	Clear
Van den Ende-Gupta Syndrome	SCARF2	Deletion	0	Clear
X-Linked Ectodermal Dysplasia	EDA	G>A	0	Clear
X-Linked Hereditary Nephropathy (Discovered in the Navasota Dog)	COL4A5	Deletion	0	Clear
X-Linked Hereditary Nephropathy (Discovered in the Samoyed)	COL4A5	G>T	0	Clear
X-Linked Myotubular Myopathy	MTM1	C>A	0	Clear
X-Linked Progressive Retinal Atrophy 1	RPGR	Deletion	0	Clear
X-Linked Progressive Retinal Atrophy 2	RPGR	Deletion	0	Clear
X-Linked Severe Combined Immunodeficiency (Discovered in the Basset Hound)	IL2RG	Deletion	0	Clear
X-Linked Severe Combined Immunodeficiency (Discovered in the Cardigan Welsh Corgi)	IL2RG	Insertion	0	Clear
X-Linked Tremors	PLP1	A>C	0	Clear
Xanthinuria (Discovered in a mixed breed dog)	Pending	G>A	0	Clear
Xanthinuria (Discovered in the Cavalier King Charles Spaniel)	Pending	Deletion	0	Clear
Xanthinuria (Discovered in the Toy Manchester Terrier)	Pending	G>T	0	Clear

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Coat Color

Genetic Trait	Gene	Variant	Copies	Result
Fawn	ASIP	a ^y	1	Fawn possible
Recessive Black	ASIP	a	1	Not black due to this variant
Tan Points	ASIP	a ^t	1	Tan points possible
Dominant Black	CBD103	K ^B	1	Black or brindle possible
Mask	MC1R	E ^m	2	Dark Muzzle possible
Recessive Red (Variant 1)	MC1R	e ¹	0	No effect
Recessive Red (Variant 2)	MC1R	e ²	0	No effect
Recessive Red (Variant 3)	MC1R	e ³	0	No effect
Widow's Peak (Discovered in Ancient dogs)	MC1R	e ^A	0	No effect
Widow's Peak (Discovered in the Afghan Hound and Saluki)	MC1R	E ^G	0	No effect
Red Intensity	MFSD12	i	2	White to yellow coat shades likely
Dilution (Variant 1) Linkage test	MLPH	d ¹	0	No effect
Dilution (Variant 2)	MLPH	d ²	0	No effect
Dilution (Variant 3)	MLPH	d ³	0	No effect
Chocolate (Variant 1)	TYRP1	b ^c	0	No effect
Chocolate (Variant 2)	TYRP1	b ^s	1	Black features likely, chocolate possible
Chocolate (Variant 3)	TYRP1	b ^d	0	No effect
Chocolate (Variant 4)	TYRP1	b ^{asd}	0	No effect

Coat Patterns

Genetic Trait	Gene	Variant	Copies	Result
Piebald	MITF	s ^p	2	Particolor or white markings possible

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Coat Patterns (continued)

Genetic Trait	Gene	Variant	Copies	Result
Merle	PMEL	M	0	No effect
Harlequin	PSMB7	H	0	No effect
Saddle Tan	RALY	-	2	Saddle possible

Coat Length and Curl

Genetic Trait	Gene	Variant	Copies	Result
Long Hair (Variant 1)	FGF5	lh ¹	2	Long coat
Long Hair (Variant 2)	FGF5	lh ²	0	No effect
Long Hair (Variant 3)	FGF5	lh ³	0	No effect
Long Hair (Variant 4)	FGF5	lh ⁴	0	No effect
Long Hair (Variant 5)	FGF5	lh ⁵	0	No effect
Curly Coat	KRT71	C	0	No effect

Hairlessness

Genetic Trait	Gene	Variant	Copies	Result
Hairlessness (Discovered in the Chinese Crested Dog)	FOXI3	Hr ^{cc}	0	No effect
Hairlessness (Discovered in the American Hairless Terrier)	SGK3	hr ^{ah}	0	No effect
Hairlessness (Discovered in the Scottish Deerhound)	SKG3	hr ^{sd}	0	No effect

More Coat Traits

Genetic Trait	Gene	Variant	Copies	Result
Hair Ridge	FGF3, FGF4, FGF19, ORAOV1	R	0	No effect

DNA Test Report

More Coat Traits (continued)

Genetic Trait	Gene	Variant	Copies	Result
Furnishings	RSPO2	F	2	Furnishings likely
Albino	SLC45A2	c ^{al}	0	No effect

Head Shape

Genetic Trait	Gene	Variant	Copies	Result
Short Snout (Variant 2)	BMP3	-	0	No effect
Short Snout (Variant 1)	SMOC2	-	0	No effect

Extra Toes

Genetic Trait	Gene	Variant	Copies	Result
Hind Dewclaws (Discovered in Asian breeds)	LMBR1	DC-1	0	No effect
Hind Dewclaws (Discovered in Western breeds)	LMBR1	DC-2	0	No effect

Body Features

Genetic Trait	Gene	Variant	Copies	Result
Back Muscle and Bulk	ACSL4	-	0	No effect
High Altitude Adaptation	EPAS1	-	0	No effect
Short Legs	FGF4	-	0	Medium to long legs
Short Tail	T-box	T	0	Full tail length likely

AMERICAN KENNEL CLUB • FOUNDED 1884

Certified Pedigree

Sex: **CRAGG'S BOY "BLACK BUDDY"**
W563031205 (01-21) BLK

LUNA BIBLOS PRINCESS

W537166207
PORTUGUESE WATER DOG FEMALE WH WH MKCS
Neckline: 8002150009020400
Date Whipped: 02/11/2021
Breeder: CHLOE R PRICE

Date: **ELLIE IV**
W551450903 (05-20) BR WH MKCS

JULE & BROWNET OLIVER
W524146401 (02-10) BR AKC DNA W592703

CASEY'S LITTLE LYRICAL ANN
W520448000 (09-10) BLK WH MKCS

FERRERO ROCHER Z KASSETEK
W54628202 (12-12) BR WH MKCS (CCN) AKC
DNA W735555

CASEY'S LITTLE LYRICAL ANN
W520448326 (06-15) BLK WH MKCS

CH FALCONETS MACHADO DE AARON
W542150101 (04-10) CR/ASB BR WH MKCS
AKC DNA W522327

SHARONNY'S LOUISE AT SANDJEWELLS
W54350701 (02-12) BLK & WH (CAN) AKC
DNA W565260

DAUER'S SAND JEWELLS GRACE
W54350701 (02-12) BLK WH MKCS (CAN)
AKC DNA W522326

CENYANETS ANTOEL Z KASSETEK
CANU P4918011

DASSEN AQUARILIC
CANU QLVNVT5263

SHARONNY'S LOUISE AT SANDJEWELLS
W54350701 (02-12) BLK & WH (CAN) AKC
DNA W565260

DAUER'S SAND JEWELLS GRACE
W54350701 (02-12) BLK WH MKCS (CAN)
AKC DNA W522326



AMERICAN
KENNEL CLUB®

Carla D. Vande...
Executive Secretary

The Seal of The American Kennel Club affixed hereto certifies that this pedigree was compiled from official Stud Book records on August 23, 2021.