AMERICAN KENNEL CLUB

NAME
TRUFFLES VIII

NUMBER
SS27243901

BREED
GOLDEN RETRIEVER

SEX
FEMALE

COLOR
LIGHT GOLDEN

DATE OF BIRTH
JUNE 6, 2021

SIRE
STARRY GOLD ICE
SS02617701 12-19 (OFEL26 AKC DNA #V843283) (HUN)

DAM
SKITTLES BERRY
SS12809403 09-21 (OFEL24)

BREEDER
RUTH GARDNER

OWNER

DEBBIE HESS
2953 S HILL RD
MILFORD MI 48381-3415

AMERICAN KENNEL CLUB®

CERTIFICATE ISSUED
AUGUST 19, 2021

This certificate invalidates all previous certificates issued.

If a date appears after the name and number of the sire and dam, it indicates the issue of the Stud Book Register in which the sire or dam is published.

For Transfer Instructions, see back of Certificate.

This Certificate issued with the right to correct or revoke by the American Kennel Club.

REGISTRATION CERTIFICATE

AIS PennHIP

(877) 727-6800 www.antechimagingservices.com

Owner's Copy

PennHIP Report

Referring Veterinarian: Dr William Schultz
Email: joe.schultzvet@gmail.com

Clinic Name: Schultz Veterinary Clinic
Clinic Address: 2770 Bennett Road
Okemos, MI 48864
Phone: (517) 337-4800
Fax:(517) 337-1874

Patient Information

Client: Hess, Arthur
Patient Name: Truffles
Reg. Name: Truffles VII
PennHIP Num: 170717
Species: Canine
Date of Birth: 06 Jun 2021
Sex: Female
Date of Study: 14 Mar 2022
Date of Report: 22 Mar 2022

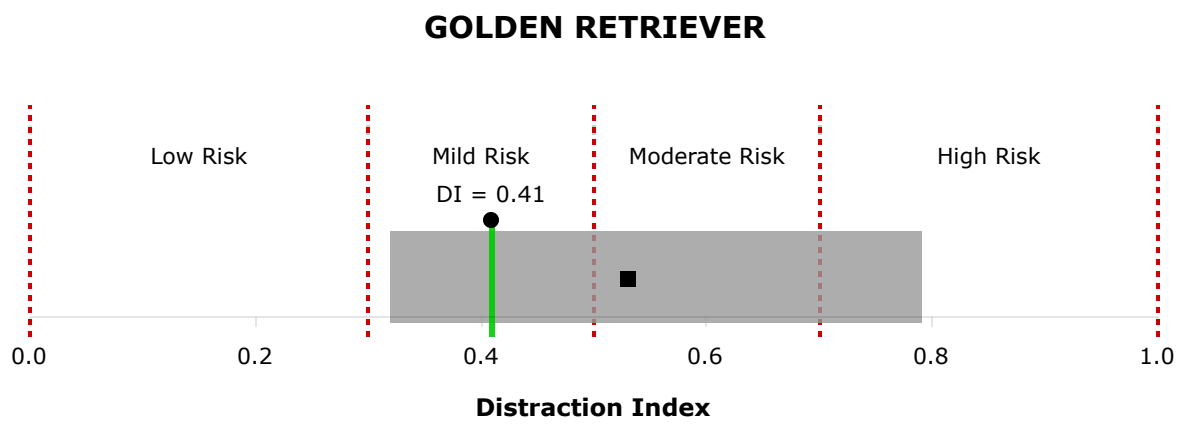
Tattoo Num:
Patient ID: 123
Registration Num: SS27243901
Microchip Num: 985113005260433
Breed: GOLDEN RETRIEVER
Age: 9 months
Weight: 48.3 lbs/21.9 kgs
Date Submitted: 16 Mar 2022

Findings

Distraction Index (DI): Right DI = 0.37, Left DI = 0.41.
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 0.41.
OA Risk Category: The DI is between 0.31 and 0.49. This patient is at mild risk for hip OA.
Distraction Index Chart:



BREED STATISTICS: This interpretation is based on a cross-section of 23790 canine patients of the GOLDEN RETRIEVER breed in the AIS PennHIP database. The gray strip represents the central 90% range of DIs (0.32 - 0.79) for the breed. The breed average DI is 0.53 (solid square). The patient DI is the solid circle (0.41).

SUMMARY: The degree of laxity (DI = 0.41) falls within the central 90% range of DIs for the breed. This amount of hip laxity places the hip at a mild risk to develop hip OA. **No radiographic evidence of OA for either hip.**

ORTHOPEDIC FOUNDATION FOR ANIMALS, INC.

TRUFFLES VIII
registered name

GOLDEN RETRIEVER
breed

film/test/lab #

985113005260433
tattoo/microchip/DNA profile

2467838
application number

06/29/2023
date of report

SS27243901
registration no.

F
sex

06/06/2021
date of birth

24
age at evaluation in months

A Not-For-Profit Organization

GR-BCA7627/24F/P-VPI
O.F.A. NUMBER

This number issued with the right to correct or revoke by the Orthopedic Foundation for Animals.

RESULTS:

Normal cardiovascular examination via auscultation - No evidence of congenital or acquired heart disease was noted. Since acquired heart disease may develop later, these evaluation results remain valid for one year, and annual examinations are recommended to continue to monitor cardiac health.

NORMAL/CLEAR - PRACTITIONER

owner
DEBBIE HESS
2953 S HILL RD
MILFORD MI 48381

OFA eCert

Verify QR scan

G.G.KELLER. D.V.M., M.S., DACVR
CHIEF OF VETERINARY SERVICES

www.ofa.org

ORTHOPEDIC FOUNDATION FOR ANIMALS, INC.

TRUFFLES VIII
registered name

GOLDEN RETRIEVER
breed

film/test/lab #

985113005260433
tattoo/microchip/DNA profile

2467838
application number

06/30/2023
date of report

SS27243901
registration no.

F
sex

06/06/2021
date of birth

24
age at evaluation in months

A Not-For-Profit Organization

GR-EL61711F24-C-VPI
O.F.A. NUMBER

This number issued with the right to correct or revoke by the Orthopedic Foundation for Animals.

RESULTS:

Based upon the radiograph submitted, the consensus was that no evidence of elbow dysplasia was recognized.

NORMAL

owner
DEBBIE HESS
2953 S HILL RD
MILFORD MI 48381

OFA eCert

Verify QR scan

G.G.KELLER. D.V.M., M.S., DACVR
CHIEF OF VETERINARY SERVICES

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ORTHOPEDIC FOUNDATION FOR ANIMALS, INC.

TRUFFLES VIII
registered name

GOLDEN RETRIEVER
breed

719334
film/test/lab #

985113005260433
tattoo/microchip/DNA profile

2467838
application number

06/23/2023
date of report

SS27243901
registration no.

F
sex

06/06/2021
date of birth

24
age at evaluation in months

A Not-For-Profit Organization

GR-EYE31384/24F-VPI
O.F.A. NUMBER

This number issued with the right to correct or revoke by the Orthopedic Foundation for Animals.

RESULTS:

Based upon the exam dated 06/08/2023, this dog has been found to be free of observable inherited eye disease and has been issued an Eye Certification Registry Number which is valid for one year from the time of the exam.

NORMAL

owner

DEBBIE HESS
2953 S HILL RD
MILFORD MI 48381

OFA eCert

Verify QR scan

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CHIEF OF VETERINARY SERVICES

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WHITE JUNE 21

Veterinary Report by Embark

embarkvet.com

Test Date: July 13th, 2021

Customer-supplied information

Owner Name: Arthur Hess
Dog Name: White June 21
Sex: Female (intact)
Date of birth: 06/06/21

Breed type: n/a
Breed: Golden Retriever
Breed registration: n/a
Microchip: n/a

Genetic summary

Genetic breed identification:
Golden Retriever

Predicted adult weight: **54 lbs**
Calculated from 17 size genes.

Genetic age: **2 human years**
Human equivalent age based on size, date of birth provided, and other factors

Clinical Tools

These clinical genetic tools can inform clinical decisions and diagnoses. These tools do not predict increased risk for disease.

Alanine Aminotransferase Activity (GPT)

White June 21's baseline ALT level is Normal

What is Alanine Aminotransferase Activity?
Alanine aminotransferase (ALT) is a clinical tool that can be used by veterinarians to better monitor liver health. This result is not associated with liver disease. ALT is one of several values veterinarians measure on routine blood work to evaluate the liver. It is a naturally occurring enzyme located in liver cells that helps break down protein. When the liver is damaged or inflamed, ALT is released into the bloodstream.

How vets diagnose this condition
Genetic testing is the only way to provide your veterinarian with this clinical tool.

How this condition is treated
Veterinarians may recommend blood work to establish a baseline ALT value for healthy dogs with one or two copies of this variant.

Health Report

How to interpret White June 21's genetic health results:
If White June 21 inherited any of the variants that we tested, they will be listed at the top of the Health Report section, along with a description of how to interpret this result. We also include all of the variants that we tested White June 21 for that we did not detect the risk variant for.

A genetic test is not a diagnosis
This genetic test does not diagnose a disease. Please talk to your vet about your dog's genetic results, or if you think that your pet may have a health condition or disease.

Good news!
White June 21 is not at increased risk for the genetic health conditions that Embark tests.

Breed-Relevant Genetic Conditions	**10 variants not detected**
Additional Genetic Conditions	**198 variants not detected**

Breed-Relevant Conditions Tested

White June 21 did not have the variants that we tested for, that are relevant to her breed:

- **Progressive Retinal Atrophy, prcd (PRCD Exon 1)**
- **Golden Retriever Progressive Retinal Atrophy 1, GR-PRA1 (SLC4A3)**
- **Golden Retriever Progressive Retinal Atrophy 2, GR-PRA2 (TTC8)**
- **Neuronal Ceroid Lipofuscinosis (CLN5 Golden Retriever Variant)**
- **Degenerative Myelopathy, DM (SOD1A)**
- **Muscular Dystrophy (DMD Golden Retriever Variant)**
- **Congenital Myasthenic Syndrome (COLQ)**
- **Dystrophic Epidermolysis Bullosa (COL7A1)**
- **Ichthyosis (PNPLA1)**
- **Osteogenesis Imperfecta, Brittle Bone Disease (COL1A1)**

Additional Conditions Tested

White June 21 did not have the variants that we tested for, in the following conditions that the potential effect on dogs with White June 21's breed may not yet be known.

- **MDR1 Drug Sensitivity (ABCB1)**
- **P2Y12 Receptor Platelet Disorder (P2Y12)**
- **Factor IX Deficiency, Hemophilia B (F9 Exon 7, Terrier Variant)**
- **Factor IX Deficiency, Hemophilia B (F9 Exon 7, Rhodesian Ridgeback Variant)**
- **Factor VII Deficiency (F7 Exon 5)**
- **Factor VIII Deficiency, Hemophilia A (F8 Exon 10, Boxer Variant)**
- **Factor VIII Deficiency, Hemophilia A (F8 Exon 11, Shepherd Variant 1)**
- **Factor VIII Deficiency, Hemophilia A (F8 Exon 1, Shepherd Variant 2)**
- **Thrombopathia (RASGRP1 Exon 5, Basset Hound Variant)**
- **Thrombopathia (RASGRP1 Exon 8)**
- **Thrombopathia (RASGRP1 Exon 5, American Eskimo Dog Variant)**
- **Von Willebrand Disease Type III, Type III vWD (VWF Exon 4)**
- **Von Willebrand Disease Type III, Type III vWD (VWF Exon 7)**
- **Von Willebrand Disease Type I (VWF)**
- **Von Willebrand Disease Type II, Type II vWD (VWF)**
- **Canine Leukocyte Adhesion Deficiency Type I, CLADI (ITGB2)**
- **Canine Leukocyte Adhesion Deficiency Type III, CLADIII (FERMT3)**
- **Congenital Macrothrombocytopenia (TUBB1 Exon 1, Cairn and Norfolk Terrier Variant)**
- **Canine Elliptocytosis (SPTB Exon 30)**
- **Glanzmann's Thrombasthenia Type I (ITGA2B Exon 13)**
- **Glanzmann's Thrombasthenia Type I (ITGA2B Exon 12)**
- **May-Hegglin Anomaly (MYH9)**
- **Prekallikrein Deficiency (KLKB1 Exon 8)**
- **Pyruvate Kinase Deficiency (PKLR Exon 5)**

Additional Conditions Tested

- Pyruvate Kinase Deficiency (PKLR Exon 7 Labrador Variant)
- Pyruvate Kinase Deficiency (PKLR Exon 7 Pug Variant)
- Pyruvate Kinase Deficiency (PKLR Exon 7 Beagle Variant)
- Pyruvate Kinase Deficiency (PKLR Exon 10)
- Trapped Neutrophil Syndrome (VPS13B)
- Ligneous Membranitis, LM (PLG)
- Platelet factor X receptor deficiency, Scott Syndrome (TMEM16F)
- Methemoglobinemia CYB5R3
- Congenital Hypothyroidism (TPO, Tenterfield Terrier Variant)
- Congenital Hypothyroidism (TPO, Rat, Toy, Hairless Terrier Variant)
- Complement 3 Deficiency, C3 Deficiency (C3)
- Severe Combined Immunodeficiency (PRKDC)
- Severe Combined Immunodeficiency (RAG1)
- X-linked Severe Combined Immunodeficiency (IL2RG Variant 1)
- X-linked Severe Combined Immunodeficiency (IL2RG Variant 2)
- Progressive Retinal Atrophy, rcd1 (PDE6B Exon 21 Irish Setter Variant)
- Progressive Retinal Atrophy, rcd3 (PDE6A)
- Progressive Retinal Atrophy, CNGA (CNGA1 Exon 9)
- Progressive Retinal Atrophy (CNGB1)
- Progressive Retinal Atrophy (SAG)
- Progressive Retinal Atrophy, crd1 (PDE6B)
- Progressive Retinal Atrophy - crd4/cord1 (RPGRIP1)
- X-Linked Progressive Retinal Atrophy 1, XL-PRA1 (RPGR)
- Progressive Retinal Atrophy, PRA3 (FAM161A)

Additional Conditions Tested

- Collie Eye Anomaly, Choroidal Hypoplasia, CEA (NHEJ1)
- Day blindness, Cone Degeneration, Achromatopsia (CNGB3 Exon 6)
- Achromatopsia (CNGA3 Exon 7 German Shepherd Variant)
- Achromatopsia (CNGA3 Exon 7 Labrador Retriever Variant)
- Autosomal Dominant Progressive Retinal Atrophy (RHO)
- Canine Multifocal Retinopathy (BEST1 Exon 2)
- Canine Multifocal Retinopathy (BEST1 Exon 5)
- Canine Multifocal Retinopathy (BEST1 Exon 10 Deletion)
- Glaucoma (ADAMTS10 Exon 9)
- Glaucoma (ADAMTS10 Exon 17)
- Glaucoma (ADAMTS17 Exon 11)
- Glaucoma (ADAMTS17 Exon 2)
- Goniodysgenesis and Glaucoma (OLFM3)
- Hereditary Cataracts, Early-Onset Cataracts, Juvenile Cataracts (HSF4 Exon 9 Shepherd Variant)
- Primary Lens Luxation (ADAMTS17)
- Congenital Stationary Night Blindness (RPE65)
- Congenital Stationary Night Blindness (LRIT3)
- Macular Corneal Dystrophy, MCD (CHST6)
- 2,8-Dihydroxyadenine Urolithiasis, 2,8-DHA Urolithiasis (APRT)
- Cystinuria Type I-A (SLC3A1)
- Cystinuria Type II-A (SLC3A1)
- Cystinuria Type II-B (SLC7A9)
- Hyperuricosuria and Hyperuricemia or Urolithiasis, HUU (SLC2A9)
- Polycystic Kidney Disease, PKD (PKD1)

Additional Conditions Tested

- Primary Hyperoxaluria (AGXT)
- Protein Losing Nephropathy, PLN (NPHS1)
- X-Linked Hereditary Nephropathy, XLHN (COL4A5 Exon 35, Samoyed Variant 2)
- Autosomal Recessive Hereditary Nephropathy, Familial Nephropathy, ARHN (COL4A4 Exon 3)
- Primary Ciliary Dyskinesia, PCD (CCDC39 Exon 3)
- Primary Ciliary Dyskinesia, PCD (NME5)
- Congenital Keratoconjunctivitis Sicca and Ichthyosiform Dermatosis, Dry Eye Curly Coat Syndrome, CKCSID (FAM83H Exon 5)
- X-linked Ectodermal Dysplasia, Anhidrotic Ectodermal Dysplasia (EDA Intron 8)
- Renal Cystadenocarcinoma and Nodular Dermatofibrosis, RCND (FLCN Exon 7)
- Canine Fucosidosis (FUCA1)
- Glycogen Storage Disease Type II, Pompe's Disease, GSD II (GAA)
- Glycogen Storage Disease Type IA, Von Gierke Disease, GSD IA (G6PC)
- Glycogen Storage Disease Type IIIA, GSD IIIA (AGL)
- Mucopolysaccharidosis Type IIIA, Sanfilippo Syndrome Type A, MPS IIIA (SGSH Exon 6 Variant 1)
- Mucopolysaccharidosis Type IIIA, Sanfilippo Syndrome Type A, MPS IIIA (SGSH Exon 6 Variant 2)
- Mucopolysaccharidosis Type VII, Sly Syndrome, MPS VII (GUSB Exon 5)
- Mucopolysaccharidosis Type VII, Sly Syndrome, MPS VII (GUSB Exon 3)
- Glycogen storage disease Type VII, Phosphofructokinase Deficiency, PFK Deficiency (PFKM Whippet and English Springer Spaniel Variant)
- Glycogen storage disease Type VII, Phosphofructokinase Deficiency, PFK Deficiency (PFKM Wachtelhund Variant)
- Lagotto Storage Disease (ATG4D)
- Neuronal Ceroid Lipofuscinosis 1, NCL 1 (PPT1 Exon 8)
- Neuronal Ceroid Lipofuscinosis 2, NCL 2 (TPP1 Exon 4)
- Neuronal Ceroid Lipofuscinosis 1, Cerebellar Ataxia, NCL4A (ARSG Exon 2)
- Neuronal Ceroid Lipofuscinosis 1, NCL 5 (CLN5 Border Collie Variant)

Additional Conditions Tested

- Neuronal Ceroid Lipofuscinosis 6, NCL 6 (CLN6 Exon 7)
- Neuronal Ceroid Lipofuscinosis 8, NCL 8 (CLN8 English Setter Variant)
- Neuronal Ceroid Lipofuscinosis (MFSD8)
- Neuronal Ceroid Lipofuscinosis (CLN8 Australian Shepherd Variant)
- Neuronal Ceroid Lipofuscinosis 10, NCL 10 (CTSD Exon 5)
- Adult-Onset Neuronal Ceroid Lipofuscinosis (ATP13A2, Tibetan Terrier Variant)
- Late-Onset Neuronal Ceroid Lipofuscinosis (ATP13A2, Australian Cattle Dog Variant)
- GM1 Gangliosidosis (GLB1 Exon 15 Shiba Inu Variant)
- GM1 Gangliosidosis (GLB1 Exon 15 Alaskan Husky Variant)
- GM1 Gangliosidosis (GLB1 Exon 2)
- GM2 Gangliosidosis (HEXB, Poodle Variant)
- GM2 Gangliosidosis (HEXA)
- Globoid Cell Leukodystrophy, Krabbe disease (GALC Exon 5)
- Autosomal Recessive Amelogenesis Imperfecta, Familial Enamel Hypoplasia (Italian Greyhound Variant)
- Autosomal Recessive Amelogenesis Imperfecta, Familial Enamel Hypoplasia (Parson Russell Terrier Variant)
- Persistent Mullerian Duct Syndrome, PMDS (AMHR2)
- Deafness and Vestibular Syndrome of Dobermans, DVDob, DINGS (MYO7A)
- Shar-Pei Autoinflammatory Disease, SPAID, Shar-Pei Fever (MTBP)
- Neonatal Interstitial Lung Disease (LAMP3)
- Alaskan Husky Encephalopathy, Subacute Necrotizing Encephalomyelopathy (SLC19A3)
- Alexander Disease (GFAP)
- Cerebellar Abiotrophy, Neonatal Cerebellar Cortical Degeneration, NCCD (SPTBN2)
- Cerebellar Ataxia, Progressive Early-Onset Cerebellar Ataxia (SEL1L)
- Cerebellar Hypoplasia (VLDLR)

Additional Conditions Tested

- Spinocerebellar Ataxia, Late-Onset Ataxia, LoSCA (CAPN1)
- Spinocerebellar Ataxia with Myokymia and/or Seizures (KCNJ10)
- Hereditary Ataxia (RAB24)
- Benign Familial Juvenile Epilepsy, Remitting Focal Epilepsy (LGI2)
- Fetal-Onset Neonatal Neuroaxonal Dystrophy (MFN2)
- Hypomyelination and Tremors (FNIP2)
- Shaking Puppy Syndrome, X-linked Generalized Tremor Syndrome (PLP)
- Neuroaxonal Dystrophy, NAD (Spanish Water Dog Variant)
- Neuroaxonal Dystrophy, NAD (Rottweiler Variant)
- L-2-Hydroxyglutaricaciduria, L2HGA (L2HGDH)
- Neonatal Encephalopathy with Seizures, NEWS (ATF2)
- Polyneuropathy, NDRG1 Malamute Variant (NDRG1 Exon 4)
- Narcolepsy (HCRTR2 Intron 4)
- Narcolepsy (HCRTR2 Intron 6)
- Narcolepsy (HCRTR2 Exon 1)
- Progressive Neuronal Abiotrophy, Canine Multiple System Degeneration, CMSD (SERAC1 Exon 15)
- Progressive Neuronal Abiotrophy, Canine Multiple System Degeneration, CMSD (SERAC1 Exon 4)
- Juvenile Laryngeal Paralysis and Polyneuropathy, Polyneuropathy with Ocular Abnormalities and Neuronal Vacuolation, POANV (RAB3GAP1, Rottweiler Variant)
- Hereditary Sensory Autonomic Neuropathy, Acral Mutilation Syndrome, AMS (GDNF-AS)
- Sensory Neuropathy (FAM134B)
- Juvenile-Onset Polyneuropathy, Leonberger Polyneuropathy 1, LPN1 (LPN1, ARHGEF10)
- Juvenile Myoclonic Epilepsy (DIRAS1)
- Juvenile-Onset Polyneuropathy, Leonberger Polyneuropathy 2, LPN2 (GJA9)
- Spongy Degeneration with Cerebellar Ataxia 1, SDCA1, SeSAME/EAST Syndrome (KCNJ10)

Additional Conditions Tested

- Spongy Degeneration with Cerebellar Ataxia 2, SDCA2 (ATP1B2)
- Dilated Cardiomyopathy, DCM1 (PDK4)
- Dilated Cardiomyopathy, DCM2 (TTN)
- Long QT Syndrome (KCNQ1)
- Cardiomyopathy and Juvenile Mortality (YARS2)
- Muscular Dystrophy (DMD, Cavalier King Charles Spaniel Variant 1)
- Limb Girdle Muscular Dystrophy (SGCD, Boston Terrier Variant)
- Ulrich-like Congenital Muscular Dystrophy (COL6A3, Labrador Variant)
- Centronuclear Myopathy (PTPLA)
- Exercise-Induced Collapse (DNM1)
- Inherited Myopathy of Great Danes (BIN1)
- Myostatin Deficiency, Bully Whippet Syndrome (MSTN)
- Myotonia Congenita (CLCN1 Exon 7)
- Myotonia Congenita (CLCN1 Exon 23)
- Myotubular Myopathy 1, X-linked Myotubular Myopathy, XL-MTM (MTM1, Labrador Variant)
- Inflammatory Myopathy (SLC25A12)
- Hypocatalasia, Acatalasemia (CAT)
- Pyruvate Dehydrogenase Deficiency (PDP1)
- Malignant Hyperthermia (RYR1)
- Imerslund-Grasbeck Syndrome, Selective Cobalamin Malabsorption (CUBN Exon 53)
- Imerslund-Grasbeck Syndrome, Selective Cobalamin Malabsorption (CUBN Exon 8)
- Inherited Selected Cobalamin Malabsorption with Proteinuria (CUBN)
- Lundehund Syndrome (LEPREL1)
- Congenital Myasthenic Syndrome (CHAT)

Additional Conditions Tested

- Congenital Myasthenic Syndrome (COLQ)
- Congenital Myasthenic Syndrome (CHRNE)
- Myasthenia Gravis Like Syndrome (CHRNE)
- Episodic Falling Syndrome (BCAN)
- Paroxysmal Dyskinesia, PxD (PGIN)
- Demyelinating Polyneuropathy (SBF2/MTRM13)
- Dystrophic Epidermolysis Bullosa (COL7A1)
- Ectodermal Dysplasia, Skin Fragility Syndrome (PKP1)
- Ichthyosis, Epidermolytic Hyperkeratosis (KRT10)
- Ichthyosis (SLC27A4)
- Ichthyosis (NIPAL4)
- Hereditary Footpad Hyperkeratosis (FAM83G)
- Hereditary Footpad Hyperkeratosis (DSG1)
- Hereditary Nasal Parakeratosis (SUV39H2)
- Musladin-Lueke Syndrome (ADAMTSL2)
- Oculocutaneous Albinism, OCA (Pekingese Type)
- Bald Thigh Syndrome (IGFBP5)
- Lethal Acrodermatitis (MKLN1)
- Ehlers Danlos (Doberman) (ADAMTS2)
- Cleft Lip and/or Cleft Palate (ADAMTS20)
- Hereditary Vitamin D-Resistant Rickets (VDR)
- Oculoskeletal Dysplasia 2, Dwarfism-Retinal Dysplasia 2, drd2, OSD2 (COL9A2, Samoyed)
- Osteogenesis Imperfecta, Brittle Bone Disease (COL1A2)
- Osteogenesis Imperfecta, Brittle Bone Disease (SERPINH1)

Additional Conditions Tested

- **Osteochondrodysplasia, Skeletal Dwarfism (SLC13A1)**
- **Skeletal Dysplasia 2, SD2 (COL11A2)**
- **Craniomandibular Osteopathy, CMO (SLC37A2)**
- **Raine Syndrome, Canine Dental Hypomineralization Syndrome (FAM20C)**
- **Chondrodystrophy and Intervertebral Disc Disease, CDDY/IVDD, Type I IVDD (FGF4 retrogene - CFA12)**
- **Chondrodystrophy, Norwegian Elkhound and Karelian Bear Dog Variant (ITGA10)**

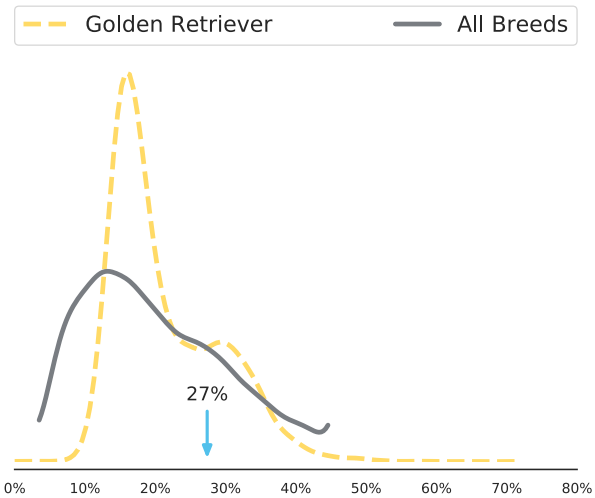
Genetic Diversity and Inbreeding

Coefficient of Inbreeding (COI)

Genetic Result: 27%

Our genetic COI measures the proportion of your dog's genome (her genes) where the genes on the mother's side are identical by descent to those on the father's side. The higher your dog's coefficient of inbreeding (the percentage), the more inbred your dog is.

Your Dog's COI



This graph represents where your dog's inbreeding levels fall on a scale compared to both dogs with a similar breed makeup to her (the yellow dotted line) and all purebred dogs (the grey line).

More on the Science

Embark scientists, along with our research partners at Cornell University, have shown the impact of inbreeding on longevity and fertility and developed a state-of-the-art, peer-reviewed method for accurately measuring COI and predicting average COI in litters.

Citations

Sams & Boyko 2019 "Fine-Scale Resolution of Runs of Homozygosity Reveal Patterns of Inbreeding and Substantial Overlap with Recessive Disease Genotypes in Domestic Dogs" (https://www.ncbi.nlm.nih.gov/pubmed/30429214)

Chu et al 2019 "Inbreeding depression causes reduced fecundity in Golden Retrievers" (https://link.springer.com/article/10.1007/s00335-019-09805-4)

Yordy et al 2019 "Body size, inbreeding, and lifespan in domestic dogs" (https://www.semanticscholar.org/paper/Body-size%2C-inbreeding%2C-and-lifespan-in-domestic-Yordy-Kraus/61d0fa7a71afb26f547f0fb7ff71e23a14d19d2c)

About Embark

Embark Veterinary is a canine genetics company offering research-grade genetic tests to pet owners and breeders. Every Embark test examines over 200,000 genetic markers, and provides results for over 200 genetic health conditions, breed identification, clinical tools, and more.

Embark is a research partner of the Cornell University College of Veterinary Medicine and collaborates with scientists and registries to accelerate genetic research in canine health. We make it easy for customers and vets to understand, share and make use of their dog's unique genetic profile to improve canine health and happiness.

Learn more at embarkvet.com

Veterinarians and hospitals can send inquiries to veterinarians@embarkvet.com.

DNA Test Report

Dog Information

White June 21 NAME	Female SEX
Golden Retriever GENETIC BREED	June 6th, 2021 DATE OF BIRTH
n/a REGISTRATION	n/a MICROCHIP

Arthur Hess
OWNER NAME

Canine Genetic Health Screen
TEST

July 13th, 2021
TEST DATE

BREED HEALTH TESTS

DISEASE	GENE	GENOTYPE	RESULT	
Degenerative Myelopathy, DM	SOD1	GG	Clear	
Golden Retriever Progressive Retinal Atrophy 1, GR-PRA1	SLC4A3 Exon 16	NN	Clear	
Golden Retriever Progressive Retinal Atrophy 2, GR-PRA2	TTC8 Exon 8	NN	Clear	
Ichthyosis	PNPLA1 (Exon 8)	AAC/AAC	Clear	
Muscular Dystrophy	DMD	AA	Clear	
Progressive Retinal Atrophy, prcd	PRCD Exon 1	GG	Clear	
Congenital Myasthenic Syndrome	COLQ	GG	Clear	
Dystrophic Epidermolysis Bullosa	COL7A1 (Exon 68)	GG	Clear	
Neuronal Ceroid Lipofuscinosis	CLN5 (Exon 4 Deletion)	NN	Clear	
Osteogenesis Imperfecta, Brittle Bone Disease	COL1A1 (Exon 18)	GG	Clear	

DNA Test Report

Dog Information

White June 21
NAME

INBREEDING AND DIVERSITY

Genetic Diversity	RESULT
Coefficient Of Inbreeding	27%
MHC Class II - DLA DRB1	High Diversity
MHC Class II - DLA DQA1 and DQB1	High Diversity

DNA Test Report

Dog Information

White June 21
NAME

TRAIT TESTS (1/2)

Coat Color		RESULT
E Locus (MC1R)	No dark hairs anywhere	ee
K Locus (CBD103)	Not expressed	K^BK^y
Intensity Loci LINKAGE	Any pigmented hair likely white or cream	Dilute Red Pigmentation
A Locus (ASIP)	Not expressed	a^ta^t
D Locus (MLPH)	Not expressed	DD
Cocoa (HPS3)	No co alleles, not expressed	NN
B Locus (TYRP1)	Likely black colored nose/feet	BB
Saddle Tan (RALY)	Not expressed	NI
S Locus (MITF)	Likely to have little to no white in coat	SS
M Locus (PMEL)	No merle alleles	mm
R Locus (USH2A) LINKAGE	Likely no impact on coat pattern	rr
H Locus (Harlequin)	No harlequin alleles	hh

Other Coat Traits		RESULT
Furnishings (RSPO2) LINKAGE	Likely unfurnished (no mustache, beard, and/or eyebrows)	II
Coat Length (FGF5)	Likely long coat	TT
Shedding (MC5R)	Likely heavy/seasonal shedding	CT
Hairlessness (FOXI3) LINKAGE	Very unlikely to be hairless	NN
Hairlessness (SGK3)	Very unlikely to be hairless	NN

DNA Test Report

Dog Information

White June 21
NAME

TRAIT TESTS (2/2)

Body Size		RESULT
Body Size (IGF1)	Larger	NN
Body Size (IGFR1)	Larger	GG
Body Size (STC2)	Intermediate	TA
Body Size (GHR - E191K)	Intermediate	GA
Body Size (GHR - P177L)	Larger	CC

Performance		RESULT
Altitude Adaptation (EPAS1)	Normal altitude tolerance	GG
Appetite (POMC) LINKAGE	Normal food motivation	NN