

# Hirka

Breed: Alaskan Malamute  
Microchip number: 578099200019194  
Birth date: 2023-06-04

Registration number: NO48183/23  
Test date: 2025-02-11  
ID kit: DSPXMKT



## Hirka's Profile

### Pet information

<b>Registered name</b> Tarraingeadh's Hirka Of 8 Wonders	<b>Sex</b> F
<b>Owner reported breed</b> Alaskan Malamute	<b>Date of birth</b> 2023-06-04
<b>Microchip number</b> 578099200019194	

### Genetic Diversity

**Hirka's Percentage of Heterozygosity**  
36%

### Health summary

- At Risk 0 conditions
- Carrier 0 conditions
- Clear 272 conditions

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## Genetic Diversity

### Heterozygosity

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#### Hirka's Percentage of Heterozygosity

36%

Hirka's genome analysis shows an average level of genetic heterozygosity when compared with other Alaskan Malamutes.

#### Typical Range for Alaskan Malamutes

30% - 37%

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## Health conditions known in the breed

Cone Degeneration (Discovered in the Alaskan Malamute)	Gene	Risk Variant	Copies	Inheritance	Result
	CNGB3	Deletion	0	AR	<b>Clear</b>

### Information about the genetic condition

Clinical signs of CD occur at the age of 8-12 weeks. Affected pups show signs of day-blindness and photophobia due to the degeneration of cone cells in the retina. Cone cells are gradually lost and may be completely absent in an adult dog affected with CD. The degeneration does not affect rod cells, therefore vision in dim light remains normal; cone degeneration does not result in complete blindness.

### Breeder recommendation

This disease is autosomal recessive meaning that two copies of the mutation are needed for disease signs to be shown. A carrier dog with one copy of the CD mutation can be safely bred with a clear dog with no copies of the CD mutation. About half of the puppies will have one copy (carriers) and half will have no copies of the CD mutation. A dog with two copies of the CD mutation can be safely bred with a clear dog. The resulting puppies will all be carriers. Puppies in a litter which is expected to contain carriers should be tested prior to breeding. Carrier to carrier matings are not advised as the resulting litter may contain affected puppies. Please note: It is possible that disease signs similar to the ones caused by the CD mutation could develop due to a different genetic or clinical cause.

Early-Onset Progressive Polyneuropathy (Discovered in the Alaskan Malamute)	Gene	Risk Variant	Copies	Inheritance	Result
	NDRG1	G>T	0	AR	<b>Clear</b>

### Information about the genetic condition

The first observable signs in are voice changes, inspiratory stridor, and pelvic limb weakness with progression to muscle weakness of all four limbs, muscle atrophy, and exercise intolerance beginning about 3 to 19 months of age. Affected dogs are usually reluctant to stand still and climb stairs and eventually progress to tetraparesis. Dogs suffering from this condition have decreased spinal reflexes in all four limbs.

### Breeder recommendation

This disease is autosomal recessive meaning that two copies of the mutation are needed for disease signs to be shown. A carrier dog with one copy of the Polyneuropathy mutation can be safely bred with a clear dog with no copies of the Polyneuropathy mutation. About half of the puppies will have one copy (carriers) and half will have no copies of the Polyneuropathy mutation. Puppies in a litter which is expected to contain carriers should be tested prior to breeding. Carrier to carrier matings are not advised as the resulting litter may contain affected puppies. Please note: It is possible that disease signs similar to the ones caused by the Polyneuropathy mutation could develop due to a different genetic or clinical cause.

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## Health conditions known in the breed

Primary Ciliary Dyskinesia (Discovered in the Alaskan Malamute)	Gene	Risk Variant	Copies	Inheritance	Result
	NME5	Deletion	0	AR	Clear

### Information about the genetic condition

Abnormal ciliary function leads to recurrent and chronic infections of the respiratory tract. Respiratory infections are first seen in young puppies a few days after birth and involve bilateral mucoid to mucopurulent nasal discharge and chronic productive cough. Respiratory infections can progress to bronchopneumonia and bronchiecstasis. Fertility problems may also be encountered and hydrocephalus has been reported as a possible clinical sign in this form of the disease. Recurrent ear infections have been reported for similar forms of this disease in humans and could be a feature, although not yet reported in the Alaskan Malamute.

### Breeder recommendation

This disease is autosomal recessive meaning that two copies of the mutation are needed for disease signs to occur. A carrier dog with one copy of the PCD mutation can be safely bred with a clear dog with no copies of the PCD mutation. About half of the puppies will have one copy (carriers) and half will have no copies of the PCD mutation. Puppies in a litter which is expected to contain carriers should be tested prior to breeding. Carrier to carrier matings are not advised as the resulting litter may contain affected puppies. Please note: It is possible that disease signs similar to the ones caused by the PCD mutation could develop due to a different genetic or clinical cause.

## Traits

### Coat Color

	Gene	Variant	Copies	Result
<b>Fawn</b>	ASIP	ay	0	No effect
<b>Recessive Black</b>	ASIP	a	0	No effect
<b>Tan Points</b>	ASIP	at	0	No effect
<b>Dominant Black</b>	CBD103	KB	0	No effect
<b>Mask</b>	MC1R	Em	0	No effect
<b>Recessive Red (e1)</b>	MC1R	e <sup>1</sup>	0	No effect
<b>Recessive Red (e2)</b>	MC1R	e <sup>2</sup>	0	No effect
<b>Recessive Red (e3)</b>	MC1R	e <sup>3</sup>	0	No effect
<b>Sable (Discovered in the Cocker Spaniel)</b>	MC1R	e <sup>H</sup>	0	No effect
<b>Widow's Peak (Discovered in Ancient dogs)</b>	MC1R	e <sup>A</sup>	2	Widow's peak likely
<p>To see the effect of the Ancient Red variant, a dog must inherit two copies of the eA variant, one from each parent, or one copy of the eA variant and one copy of any of the recessive red (e1-3) variants. Interactions of Ancient Red with other variants is complex. The characteristic coat color patterning associated with the Ancient Red variant is possible to see on genetically agouti, tan pointed or fawn dogs (that are dark shaded). This pattern results in receding of dark pigment on the undersides, legs and face where the contrast of dark hair on the top of the head gives an impression of a widow's peak. This particular pattern is called "domino" or "grizzle" depending on the breed. It is also common that the dog has white markings on the centerline of the face along with reduced pigment up the centerline of the nose that may be referred to as a "dudley nose" or "snow nose". When dominant black or brindle is present and Ancient Red is inherited, alone or in combination with other recessive red variants, the color patterning will instead mimic what has been inherited at the A locus, such as fawn, agouti, or tan points. Similarly, genetically recessive black dogs will resemble a dark agouti or tan pointed color pattern.</p>				
<b>Widow's Peak (Discovered in the Afghan Hound and Saluki)</b>	MC1R	e <sup>G</sup>	0	No effect

## Color Modification

	Gene	Variant	Copies	Result
<b>Cocoa (Discovered in the French Bulldog)</b>	HPS3	co	0	No effect
<b>Red Intensity</b> Dogs with two copies of the Red Intensity variant are more likely to show yellow, cream or white coat shades instead of deeper red shades. If the dog does not display solid red or red coat patterns, there will be no visible effect. Other genes, notably variants in the KITLG gene, are also thought to contribute to red pigment intensity variation, so some dogs may have yellow or buff colored coats.	MFSD12	i	2	White to yellow coat shades likely
<b>Dilution (d1) Linkage test</b>	MLPH	d <sup>1</sup>	0	No effect
<b>Dilution (d2)</b>	MLPH	d <sup>2</sup>	0	No effect
<b>Dilution (d3)</b>	MLPH	d <sup>3</sup>	0	No effect
<b>Chocolate (basd)</b>	TYRP1	b <sup>asd</sup>	0	No effect
<b>Chocolate (bc)</b>	TYRP1	b <sup>c</sup>	0	No effect
<b>Chocolate (bd)</b>	TYRP1	b <sup>d</sup>	0	No effect
<b>Chocolate (be)</b>	TYRP1	b <sup>e</sup>	0	No effect
<b>Chocolate (bh)</b>	TYRP1	b <sup>h</sup>	0	No effect
<b>Chocolate (bs)</b>	TYRP1	b <sup>s</sup>	0	No effect

## Coat Patterns

	Gene	Variant	Copies	Result
<b>Piebald</b> Dog with copies of the Piebald variant are likely to show white spotting, patches and/or a white coat, with two copies having a greater effect than one, although the strength of this effect may be influenced by other genes.	MITF	sp	2	Particolor or white markings possible
<b>Merle</b>	PMEL	M	0	No effect
<b>Harlequin</b>	PSMB7	H	0	No effect

## Coat Patterns

	Gene	Variant	Copies	Result
<b>Saddle Tan</b> One or two copies of the Saddle Tan variant are needed for the "saddle" to be seen. However the Tan Points variant must also be present. The Saddle Tan variant is actually considered to be the wild type, or default, variant.	RALY	-	2	Saddle possible
<b>Roan Linkage Test</b>	USH2A	Tr	0	No effect

## Coat Length and Curl

	Gene	Variant	Copies	Result
<b>Long Hair (lh1)</b> To show a long coat, a dog must inherit two copies of a Long Hair variant, one from each parent. This can either be two copies of a particular variant, such as this one (lh1) or two of any combination of long hair variants. However, there are other variants suspected to influence coat length.	FGF5	lh <sup>1</sup>	1	Short coat likely, long coat possible
<b>Long Hair (lh2)</b>	FGF5	lh <sup>2</sup>	0	No effect
<b>Long Hair (lh3)</b>	FGF5	lh <sup>3</sup>	0	No effect
<b>Long Hair (lh4)</b>	FGF5	lh <sup>4</sup>	0	No effect
<b>Long Hair (lh5)</b>	FGF5	lh <sup>5</sup>	0	No effect
<b>Curly Coat</b>	KRT71	C	0	No effect

## Hairlessness

	Gene	Variant	Copies	Result
<b>Hairlessness (Discovered in the Chinese Crested Dog) Linkage test</b>	FOXI3	Hr <sup>cc</sup>	0	No effect
<b>Hairlessness (Discovered in the American Hairless Terrier)</b>	SGK3	hr <sup>ahT</sup>	0	No effect
<b>Hairlessness (Discovered in the Scottish Deerhound)</b>	SGK3	hr <sup>sd</sup>	0	No effect

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## Shedding

	Gene	Variant	Copies	Result
Reduced Shedding	MC5R	sd	0	Seasonal shedder

## More Coat Traits

	Gene	Variant	Copies	Result
Hair Ridge	FGF3, FGF4, FGF19, ORAOV1	R	0	No effect
Furnishings	RSPO2	F	0	No effect
Albino	SLC45A2	cal	0	No effect

## Head Shape

	Gene	Variant	Copies	Result
Short Snout (BMP3 variant)	BMP3	-	0	No effect
Short Snout (SMOC2 variant)	SMOC2	-	0	No effect

## Eye Color

	Gene	Variant	Copies	Result
Blue Eyes (Discovered in the Siberian Husky)	ALX4	-	0	No effect

## Ears

	Gene	Variant	Copies	Result
Floppy Ears	MSRB3	-	0	Pricked ears more likely

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## Extra Toes

	Gene	Variant	Copies	Result
<b>Hind Dewclaws (Discovered in Asian breeds)</b>	LMBR1	DC-1	0	No effect
<b>Hind Dewclaws (Discovered in Western breeds)</b>	LMBR1	DC-2	0	No effect

## More Body Features

	Gene	Variant	Copies	Result
<b>Back Muscle and Bulk</b> One or two copies of the Back Muscle and Bulk variant may result in a bulkier more muscled back.	ACSL4	-	1	Bulky appearance likely
<b>High Altitude Adaptation</b>	EPAS1	-	0	No effect
<b>Short Legs (Chondrodysplasia, CDPA)</b>	FGF4	-	0	No effect
<b>Short Legs (Chondrodystrophy, CDDY)</b>	FGF4	-	0	No effect
<b>Short Tail</b>	T-box	T	0	Full tail length likely

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>2,8-dihydroxyadenine (DHA) Urolithiasis</b>	APRT	G>A	0	AR	Clear
<b>Acral Mutilation Syndrome</b>	GDNF	C>T	0	AR	Clear
<b>Acute Respiratory Distress Syndrome</b>	ANLN	C>T	0	AR	Clear
<b>Alaskan Husky Encephalopathy</b>	SLC19A3	G>A	0	AR	Clear
<b>Alexander Disease</b>	GFAP	G>A	0	AR	Clear
<b>Amelogenesis Imperfecta (Discovered in the Italian Greyhound)</b>	ENAM	Deletion	0	AR	Clear
<b>Amelogenesis Imperfecta (Discovered in the Lancashire Heeler)</b>	Confidential	-	0	AR	Clear
<b>Amelogenesis Imperfecta (Discovered in the Parson Russell Terrier)</b>	ENAM	C>T	0	AR	Clear
<b>Bandera's Neonatal Ataxia</b>	GRM1	Insertion	0	AR	Clear
<b>Benign Familial Juvenile Epilepsy</b>	LGI2	A>T	0	AR	Clear
<b>Bernard-Soulier Syndrome (Discovered in the Cocker Spaniel)</b>	GP9	Deletion	0	AR	Clear
<b>Canine Congenital Stationary Night Blindness (Discovered in the Beagle)</b>	LRIT3	Deletion	0	AR	Clear
<b>Canine Leukocyte Adhesion Deficiency (CLAD), type III</b>	FERMT3	Insertion	0	AR	Clear
<b>Canine Multifocal Retinopathy 1</b>	BEST1	C>T	0	AR	Clear
<b>Canine Multifocal Retinopathy 2</b>	BEST1	G>A	0	AR	Clear
<b>Canine Multifocal Retinopathy 3</b>	BEST1	Deletion	0	AR	Clear
<b>Canine Multiple Systems Degeneration (Discovered in the Chinese Crested Dog)</b>	SERAC1	Deletion	0	AR	Clear
<b>Canine Scott Syndrome</b>	ANO6	G>A	0	AR	Clear
<b>Cardiomyopathy and Juvenile Mortality (Discovered in the Belgian Shepherd)</b>	YARS2	G>A	0	AR	Clear
<b>Centronuclear Myopathy (Discovered in the Great Dane)</b>	BIN1	A>G	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Centronuclear Myopathy (Discovered in the Labrador Retriever)</b>	PTPLA	Insertion	0	AR	Clear
<b>Cerebellar Ataxia</b>	RAB24	A>C	0	AR	Clear
<b>Cerebellar Cortical Degeneration</b>	SNX14	C>T	0	AR	Clear
<b>Cerebellar Hypoplasia</b>	VLDLR	Deletion	0	AR	Clear
<b>Cerebral Dysfunction</b>	SLC6A3	G>A	0	AR	Clear
<b>Chondrodysplasia (Discovered in Norwegian Elkhound and Karelian Bear Dog)</b>	ITGA10	C>T	0	AR	Clear
<b>Chondrodystrophy (CDDY) and Intervertebral Disc Disease (IVDD) Risk</b>	FGF4 retrogene	Insertion	0	AD	Clear
<b>Cleft Lip &amp; Palate with Syndactyly</b>	ADAMTS20	Deletion	0	AR	Clear
<b>Cleft Palate</b>	DLX6	C>A	0	AR	Clear
<b>CNS Atrophy with Cerebellar Ataxia (Discovered in the Belgian Shepherd)</b>	SEPP1	Deletion	0	AR	Clear
<b>Coat Color Dilution and Neurological Defects (Discovered in the Miniature Dachshund)</b>	MYO5A	Insertion	0	AR	Clear
<b>Collie Eye Anomaly (CEA)</b>	NHEJ1	Deletion	0	AR	Clear
<b>Complement 3 Deficiency</b>	C3	Deletion	0	AR	Clear
<b>Cone Degeneration (Discovered in the German Shepherd Dog)</b>	CNGA3	C>T	0	AR	Clear
<b>Cone Degeneration (Discovered in the German Shorthaired Pointer)</b>	CNGB3	G>A	0	AR	Clear
<b>Cone-Rod Dystrophy</b>	NPHP4	Deletion	0	AR	Clear
<b>Cone-Rod Dystrophy 1</b>	PDE6B	Deletion	0	AR	Clear
<b>Cone-Rod Dystrophy 2</b>	IQCB1	Insertion	0	AR	Clear
<b>Congenital Cornification (Discovered in the Labrador Retriever)</b>	NSDHL	Deletion	0	XD	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Congenital Dyshormonogenic Hypothyroidism with Goiter (Discovered in the Shih Tzu)</b>	SLC5A5	G>A	0	AR	Clear
<b>Congenital Eye Malformations (Discovered in the Golden Retriever)</b>	SIX6	C>T	0	AD	Clear
<b>Congenital Hypothyroidism (Discovered in the Tenterfield Terrier)</b>	TPO	C>T	0	AR	Clear
<b>Congenital Hypothyroidism (Discovered in the Toy Fox and Rat Terrier)</b>	TPO	C>T	0	AR	Clear
<b>Congenital Muscular Dystrophy (Discovered in the Italian Greyhound)</b>	LAMA2	G>A	0	AR	Clear
<b>Congenital Muscular Dystrophy (Discovered in the Staffordshire Bull Terrier)</b>	LAMA2	Deletion	0	AR	Clear
<b>Congenital Myasthenic Syndrome (Discovered in the Golden Retriever)</b>	COLQ	G>A	0	AR	Clear
<b>Congenital Myasthenic Syndrome (Discovered in the Heiderterrier)</b>	CHRNE	Insertion	0	AR	Clear
<b>Congenital Myasthenic Syndrome (Discovered in the Jack Russell Terrier)</b>	CHRNE	Insertion	0	AR	Clear
<b>Congenital Myasthenic Syndrome (Discovered in the Labrador Retriever)</b>	COLQ	T>C	0	AR	Clear
<b>Congenital Myasthenic Syndrome (Discovered in the Old Danish Pointer)</b>	CHAT	G>A	0	AR	Clear
<b>Congenital Stationary Night Blindness (CSNB)</b>	RPE65	A>T	0	AR	Clear
<b>Craniomandibular Osteopathy (Discovered in Scottish Terrier breeds)</b>	SLC37A2	C>T	0	AD	Clear
<b>Craniomandibular Osteopathy (Discovered in the Australian Terrier)</b>	COL1A1	C>T	0	AD	Clear
<b>Craniomandibular Osteopathy (Discovered in the Basset Hound)</b>	SLC37A2	C>T	0	AD	Clear
<b>Craniomandibular Osteopathy (Discovered in the Weimaraner)</b>	SLC35D1	Deletion	0	AD	Clear
<b>Cystic Renal Dysplasia and Hepatic Fibrosis</b>	INPP5E	G>A	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Cystinuria Type I-A</b>	SLC3A1	C>T	0	AR	Clear
<b>Cystinuria Type II-A</b>	SLC3A1	Deletion	0	AD	Clear
<b>Darier Disease (Discovered in the Irish Terrier)</b>	ATP2A2	Insertion	0	AD	Clear
<b>Deafness and Vestibular Dysfunction (DINGS1), (Discovered in Doberman Pinscher)</b>	PTPRQ	Insertion	0	AR	Clear
<b>Deafness and Vestibular Dysfunction (DINGS2), (Discovered in Doberman Pinscher)</b>	MYO7A	G>A	0	AR	Clear
<b>Degenerative Myelopathy</b>	SOD1	G>A	0	AR	Clear
<b>Demyelinating Neuropathy</b>	SBF2	G>T	0	AR	Clear
<b>Dental Hypomineralization</b>	FAM20C	C>T	0	AR	Clear
<b>Dental-Skeletal-Retinal Anomaly (Discovered in the Cane Corso)</b>	MIA3	Deletion	0	AR	Clear
<b>Dilated Cardiomyopathy (Discovered in the Schnauzer)</b>	RBM20	Deletion	0	AR	Clear
<b>Disproportionate Dwarfism (Discovered in the Dogo Argentino)</b>	PRKG2	C>A	0	AR	Clear
<b>Dominant Progressive Retinal Atrophy</b>	RHO	C>G	0	AD	Clear
<b>Dystrophic Epidermolysis Bullosa (Discovered in the Basset Hound)</b>	COL7A1	Insertion	0	AR	Clear
<b>Dystrophic Epidermolysis Bullosa (Discovered in the Central Asian Ovcharka)</b>	COL7A1	C>T	0	AR	Clear
<b>Dystrophic Epidermolysis Bullosa (Discovered in the Golden Retriever)</b>	COL7A1	C>T	0	AR	Clear
<b>Early Adult Onset Deafness For Border Collies only (Linkage test)</b>	Intergenic	Insertion	0	AR	Clear
<b>Early Retinal Degeneration (Discovered in the Norwegian Elkhound)</b>	STK38L	Insertion	0	AR	Clear
<b>Early-Onset Adult Deafness (Discovered in the Rhodesian Ridgeback)</b>	EPS8L2	Deletion	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Early-Onset Progressive Polyneuropathy (Discovered in the Greyhound)</b>	NDRG1	Deletion	0	AR	Clear
<b>Early-Onset Progressive Retinal Atrophy (Discovered in the Portuguese Water Dog)</b>	CCDC66	Insertion	0	AR	Clear
<b>Early-Onset Progressive Retinal Atrophy, (Discovered in the Spanish Water Dog)</b>	PDE6B	Deletion	0	AR	Clear
<b>Ehlers-Danlos Syndrome (Discovered in mixed breed)</b>	COL5A1	G>A	0	AD	Clear
<b>Ehlers-Danlos Syndrome (Discovered in the Labrador Retriever)</b>	COL5A1	Deletion	0	AD	Clear
<b>Epidermolytic Hyperkeratosis</b>	KRT10	G>T	0	AR	Clear
<b>Episodic Falling Syndrome</b>	BCAN	Insertion	0	AR	Clear
<b>Exercise-Induced Collapse</b>	DNM1	G>T	0	AR	Clear
<b>Factor VII Deficiency</b>	F7	G>A	0	AR	Clear
<b>Factor XI Deficiency</b>	FXI	Insertion	0	AD	Clear
<b>Familial Nephropathy (Discovered in the English Cocker Spaniel)</b>	COL4A4	A>T	0	AR	Clear
<b>Familial Nephropathy (Discovered in the English Springer Spaniel)</b>	COL4A4	C>T	0	AR	Clear
<b>Fanconi Syndrome</b>	FAN1	Deletion	0	AR	Clear
<b>Fetal Onset Neuroaxonal Dystrophy</b>	MFN2	G>C	0	AR	Clear
<b>Focal Non-Epidermolytic Palmoplantar Keratoderma</b>	KRT16	G>C	0	AR	Clear
<b>Generalized Progressive Retinal Atrophy (Discovered in the Schapendoes)</b>	CCDC66	Insertion	0	AR	Clear
<b>Glanzmann Thrombasthenia Type I (Discovered in Great Pyrenees)</b>	ITGA2B	C>G	0	AR	Clear
<b>Glanzmann Thrombasthenia Type I (Discovered in mixed breed dogs)</b>	ITGA2B	C>T	0	AR	Clear
<b>Globoid Cell Leukodystrophy (Discovered in Terriers)</b>	GALC	A>C	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Globoid Cell Leukodystrophy (Discovered in the Irish Setter)</b>	GALC	A>T	0	AR	Clear
<b>Glycogen Storage Disease Type Ia (Discovered in the German Pinscher)</b>	G6PC	Insertion	0	AR	Clear
<b>Glycogen Storage Disease Type Ia (Discovered in the Maltese)</b>	G6PC	G>C	0	AR	Clear
<b>Glycogen Storage Disease Type IIIa, (GSD IIIa)</b>	AGL	Deletion	0	AR	Clear
<b>GM1 Gangliosidosis (Discovered in the Portuguese Water Dog)</b>	GLB1	G>A	0	AR	Clear
<b>GM1 Gangliosidosis (Discovered in the Shiba)</b>	GLB1	Deletion	0	AR	Clear
<b>GM2 Gangliosidosis (Discovered in the Japanese Chin)</b>	HEXA	G>A	0	AR	Clear
<b>GM2 Gangliosidosis (Discovered in the Toy Poodle)</b>	HEXB	Deletion	0	AR	Clear
<b>Hemophilia A (Discovered in Old English Sheepdog)</b>	FVIII	C>T	0	XR	Clear
<b>Hemophilia A (Discovered in the Boxer)</b>	FVIII	C>G	0	XR	Clear
<b>Hemophilia A (Discovered in the German Shepherd Dog - Variant 1)</b>	FVIII	G>A	0	XR	Clear
<b>Hemophilia A (Discovered in the German Shepherd Dog - Variant 2)</b>	FVIII	G>A	0	XR	Clear
<b>Hemophilia A (Discovered in the Havanese)</b>	FVIII	Insertion	0	XR	Clear
<b>Hemophilia A (Discovered in the Labrador Retriever)</b>	Confidential	-	0	XR	Clear
<b>Hemophilia B</b>	FIX	G>A	0	XR	Clear
<b>Hemophilia B (Discovered in the Airedale Terrier)</b>	FIX	Insertion	0	XR	Clear
<b>Hemophilia B (Discovered in the Lhasa Apso)</b>	FIX	Deletion	0	XR	Clear
<b>Hereditary Ataxia (Discovered in the Belgian Malinois)</b>	SLC12A6	Insertion	0	AR	Clear
<b>Hereditary Ataxia (Discovered in the Norwegian Buhund)</b>	KCNIP4	T>C	0	AR	Clear
<b>Hereditary Calcium Oxalate Urolithiasis, Type 1</b>	Confidential	-	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Hereditary Elliptocytosis</b>	SPTB	C>T	0	AD	Clear
<b>Hereditary Footpad Hyperkeratosis</b>	FAM83G	G>C	0	AR	Clear
<b>Hereditary Nasal Parakeratosis (Discovered in the Greyhound)</b>	SUV39H2	Deletion	0	AR	Clear
<b>Hereditary Nasal Parakeratosis (Discovered in the Labrador Retriever)</b>	SUV39H2	A>C	0	AR	Clear
<b>Hereditary Vitamin D-Resistant Rickets Type II</b>	VDR	Deletion	0	AR	Clear
<b>Hyperuricosuria</b>	SLC2A9	G>T	0	AR	Clear
<b>Hypocatalasia</b>	CAT	G>A	0	AR	Clear
<b>Hypomyelination</b>	FNIP2	Deletion	0	AR	Clear
<b>Hypophosphatasia</b>	Confidential	-	0	AR	Clear
<b>Ichthyosis (Discovered in the American Bulldog)</b>	NIPAL4	Deletion	0	AR	Clear
<b>Ichthyosis (Discovered in the Great Dane)</b>	SLC27A4	G>A	0	AR	Clear
<b>Ichthyosis Type 2 (Discovered in the Golden Retriever)</b>	ABHD5	Deletion	0	AR	Clear
<b>Inflammatory Myopathy (Discovered in the Dutch Shepherd Dog)</b>	SLC25A12	A>G	0	AR	Clear
<b>Inflammatory Pulmonary Disease (Discovered in the Rough Collie)</b>	AKNA	Deletion	0	AR	Clear
<b>Intestinal Cobalamin Malabsorption (Discovered in the Beagle)</b>	CUBN	Deletion	0	AR	Clear
<b>Intestinal Cobalamin Malabsorption (Discovered in the Border Collie)</b>	CUBN	Deletion	0	AR	Clear
<b>Intestinal Cobalamin Malabsorption (Discovered in the Komondor)</b>	CUBN	G>A	0	AR	Clear
<b>Intestinal Lipid Malabsorption (Discovered in the Australian Kelpie)</b>	ACSL5	Deletion	0	AR	Clear
<b>Junctional Epidermolysis Bullosa (Discovered in the Australian Cattle Dog Mix)</b>	LAMA3	T>A	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Junctional Epidermolysis Bullosa (Discovered in the Australian Shepherd)</b>	LAMB3	A>G	0	AR	Clear
<b>Juvenile Cataract (Discovered in the Wirehaired Pointing Griffon)</b>	FYCO1	Deletion	0	AR	Clear
<b>Juvenile Dilated Cardiomyopathy (Discovered in the Toy Manchester Terrier)</b>	ABCC9	G>A	0	AR	Clear
<b>Juvenile Encephalopathy (Discovered in the Parson Russell Terrier)</b>	Confidential	-	0	AR	Clear
<b>Juvenile Laryngeal Paralysis and Polyneuropathy</b>	RAB3GAP1	Deletion	0	AR	Clear
<b>Juvenile Myoclonic Epilepsy</b>	DIRAS1	Deletion	0	AR	Clear
<b>L-2-Hydroxyglutaric aciduria (Discovered in the Staffordshire Bull Terrier)</b>	L2HGDH	T>C	0	AR	Clear
<b>L-2-Hydroxyglutaric Aciduria (Discovered in the West Highland White Terrier)</b>	Confidential	-	0	AR	Clear
<b>Lafora Disease (Linkage test)</b>	NHLRC1	Insertion	0	AR	Clear
<b>Lagotto Storage Disease</b>	ATG4D	G>A	0	AR	Clear
<b>Lamellar Ichthyosis</b>	TGM1	Insertion	0	AR	Clear
<b>Laryngeal Paralysis (Discovered in the Bull Terrier and Miniature Bull Terrier)</b>	RAPGEF6	Insertion	0	AR	Clear
<b>Leigh-like Subacute Necrotizing Encephalopathy (Discovered in the Yorkshire Terrier)</b>	SLC19A3	Insertion	0	AR	Clear
<b>Lethal Acrodermatitis (Discovered in the Bull Terrier)</b>	MKLN1	A>C	0	AR	Clear
<b>Leukodystrophy (Discovered in the Standard Schnauzer)</b>	TSEN54	C>T	0	AR	Clear
<b>Ligneous Membranitis</b>	PLG	T>A	0	AR	Clear
<b>Limb-girdle Muscular Dystrophy (Discovered in the Boston Terrier)</b>	SGCD	Deletion	0	AR	Clear
<b>Limb-girdle Muscular Dystrophy, Type L3 (Discovered in the Miniature Dachshund)</b>	SGCA	G>A	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
Lung Developmental Disease (Discovered in the Airedale Terrier)	LAMP3	C>T	0	AR	Clear
Macrothrombocytopenia (Discovered in Norfolk and Cairn Terrier)	TUBB1	G>A	0	AR	Clear
May-Hegglin Anomaly	MYH9	G>A	0	AD	Clear
MDR1 Medication Sensitivity	MDR1/ABCB1	Deletion	0	AD	Clear
Microphthalmia (Discovered in the Soft-Coated Wheaten Terrier)	RBP4	Deletion	0	AR	Clear
Mucopolysaccharidosis Type IIIA (Discovered in the Dachshund)	SGSH	C>A	0	AR	Clear
Mucopolysaccharidosis Type IIIA (Discovered in the New Zealand Huntaway)	SGSH	Insertion	0	AR	Clear
Mucopolysaccharidosis Type VII (Discovered in the Brazilian Terrier)	GUSB	C>T	0	AR	Clear
Mucopolysaccharidosis Type VII (Discovered in the German Shepherd Dog)	GUSB	G>A	0	AR	Clear
Mucopolysaccharidosis VI (Discovered in the Miniature Pinscher)	ARSB	G>A	0	AR	Clear
Muscular Dystrophy (Discovered in the Cavalier King Charles Spaniel)	Dystrophin	G>T	0	XR	Clear
Muscular Dystrophy (Discovered in the Golden Retriever)	Dystrophin	A>G	0	XR	Clear
Muscular Dystrophy (Discovered in the Landseer)	COL6A1	G>T	0	AR	Clear
Muscular Dystrophy (Discovered in the Norfolk Terrier)	Dystrophin	Deletion	0	XR	Clear
Muscular Dystrophy-Dystroglycanopathy (Discovered in the Labrador Retriever)	LARGE	C>T	0	AR	Clear
Muscular Hypertrophy (Double Muscling)	MSTN	T>A	0	AR	Clear
Musladin-Lueke Syndrome	ADAMTSL2	C>T	0	AR	Clear
Myeloperoxidase Deficiency	MOP	C>T	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Myotonia Congenita (Discovered in Australian Cattle Dog)</b>	CLCN1	Insertion	0	AR	Clear
<b>Myotonia Congenita (Discovered in the Labrador Retriever)</b>	CLCN1	T>A	0	AR	Clear
<b>Myotonia Congenita (Discovered in the Miniature Schnauzer)</b>	CLCN1	C>T	0	AR	Clear
<b>Myotubular Myopathy</b>	MTM1	A>C	0	XR	Clear
<b>Narcolepsy (Discovered in the Dachshund)</b>	HCRTR2	G>A	0	AR	Clear
<b>Narcolepsy (Discovered in the Labrador Retriever)</b>	HCRTR2	G>A	0	AR	Clear
<b>Nemaline Myopathy</b>	NEB	C>A	0	AR	Clear
<b>Neonatal Cerebellar Cortical Degeneration</b>	SPTBN2	Deletion	0	AR	Clear
<b>Neonatal Encephalopathy with Seizures</b>	ATF2	T>G	0	AR	Clear
<b>Neuroaxonal Dystrophy (Discovered in Spanish Water Dog)</b>	TECPR2	C>T	0	AR	Clear
<b>Neuroaxonal Dystrophy (Discovered in the Papillon)</b>	PLA2G6	G>A	0	AR	Clear
<b>Neuroaxonal Dystrophy (Discovered in the Rottweiler)</b>	VPS11	A>G	0	AR	Clear
<b>Neuronal Ceroid Lipofuscinosis 1</b>	PPT1	Insertion	0	AR	Clear
<b>Neuronal Ceroid Lipofuscinosis 12 (Discovered in the Australian Cattle Dog)</b>	ATP13A2	C>T	0	AR	Clear
<b>Neuronal Ceroid Lipofuscinosis 5 (Discovered in the Border Collie)</b>	CLN5	C>T	0	AR	Clear
<b>Neuronal Ceroid Lipofuscinosis 5 (Discovered in the Golden Retriever)</b>	CLN5	Deletion	0	AR	Clear
<b>Neuronal Ceroid Lipofuscinosis 7</b>	MFSD8	Deletion	0	AR	Clear
<b>Neuronal Ceroid Lipofuscinosis 8 (Discovered in the Alpine Dachsbracke)</b>	CLN8	Deletion	0	AR	Clear
<b>Neuronal Ceroid Lipofuscinosis 8 (Discovered in the Australian Shepherd)</b>	CLN8	G>A	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Neuronal Ceroid Lipofuscinosis 8 (Discovered in the English Setter)</b>	CLN8	T>C	0	AR	Clear
<b>Neuronal Ceroid Lipofuscinosis 8 (Discovered in the Saluki)</b>	CLN8	Insertion	0	AR	Clear
<b>Obesity risk (POMC)</b>	POMC	Deletion	0	AD	Clear
<b>Osteochondrodysplasia</b>	SLC13A1	Deletion	0	AR	Clear
<b>Osteochondromatosis (Discovered in the American Staffordshire Terrier)</b>	EXT2	C>A	0	AR	Clear
<b>Osteogenesis Imperfecta (Discovered in the Beagle)</b>	COL1A2	C>T	0	AD	Clear
<b>Osteogenesis Imperfecta (Discovered in the Dachshund)</b>	SERPINH1	T>C	0	AR	Clear
<b>P2RY12-associated Bleeding Disorder</b>	P2RY12	Deletion	0	AR	Clear
<b>Palmoplantar Hyperkeratosis (Discovered in the Rottweiler)</b>	DSG1	Deletion	0	AR	Clear
<b>Paroxysmal Dyskinesia</b>	PIGN	C>T	0	AR	Clear
<b>Persistent Müllerian Duct Syndrome</b>	AMHR2	C>T	0	AR	Clear
<b>Phosphofructokinase Deficiency</b>	PFKM	G>A	0	AR	Clear
<b>Pituitary Dwarfism (Discovered in the Karelian Bear Dog)</b>	POU1F1	C>A	0	AR	Clear
<b>Polycystic Kidney Disease</b>	PKD1	G>A	0	AD	Clear
<b>Prekallikrein Deficiency</b>	KLKB1	T>A	0	AR	Clear
<b>Primary Ciliary Dyskinesia</b>	CCDC39	C>T	0	AR	Clear
<b>Primary Lens Luxation</b>	ADAMTS17	G>A	0	AR	Clear
<b>Primary Open Angle Glaucoma (Discovered in Basset Fauve de Bretagne)</b>	ADAMTS17	G>A	0	AR	Clear
<b>Primary Open Angle Glaucoma (Discovered in Petit Basset Griffon Vendeen)</b>	ADAMTS17	Insertion	0	AR	Clear
<b>Primary Open Angle Glaucoma and Lens Luxation (Discovered in Chinese Shar-Pei)</b>	ADAMTS17	Deletion	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Progressive Early-Onset Cerebellar Ataxia</b>	SEL1L	T>C	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Basenji)</b>	SAG	T>C	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Golden Retriever - GR-PRA 2 variant)</b>	TTC8	Deletion	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Golden Retriever - GR-PRA1 variant)</b>	SLC4A3	Insertion	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Lapponian Herder)</b>	IFT122	C>T	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Lhasa Apso)</b>	IMPG2	Insertion	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Miniature Long Haired Dachshund)</b>	RPGRIP1	Insertion	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Papillon and Phalène)</b>	CNGB1	Deletion	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Shetland Sheepdog - BBS2 variant)</b>	Confidential	-	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Shetland Sheepdog - CNGA1 variant)</b>	CNGA1	Deletion	0	AR	Clear
<b>Progressive Retinal Atrophy (Discovered in the Swedish Vallhund)</b>	MERTK	Insertion	0	AR	Clear
<b>Progressive Retinal Atrophy 1 (Discovered in the Italian Greyhound)</b>	Confidential	-	0	AR	Clear
<b>Progressive Retinal Atrophy Type III</b>	FAM161A	Insertion	0	AR	Clear
<b>Progressive Rod Cone Degeneration (prcd-PRA)</b>	PRCD	G>A	0	AR	Clear
<b>Protein Losing Nephropathy</b>	NPHS1	G>A	0	AR	Clear
<b>Pyruvate Dehydrogenase Phosphatase 1 Deficiency</b>	PDP1	C>T	0	AR	Clear
<b>Pyruvate Kinase Deficiency (Discovered in the Basenji)</b>	PKLR	Deletion	0	AR	Clear
<b>Pyruvate Kinase Deficiency (Discovered in the Beagle)</b>	PKLR	G>A	0	AR	Clear
<b>Pyruvate Kinase Deficiency (Discovered in the Pug)</b>	PKLR	T>C	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Pyruvate Kinase Deficiency (Discovered in the West Highland White Terrier)</b>	PKLR	Insertion	0	AR	Clear
<b>QT Syndrome</b>	KCNQ1	C>A	0	AD	Clear
<b>Renal Cystadenocarcinoma and Nodular Dermatofibrosis</b>	FLCN	A>G	0	AD	Clear
<b>Rod-Cone Dysplasia 1</b>	PDE6B	G>A	0	AR	Clear
<b>Rod-Cone Dysplasia 1a</b>	PDE6B	Insertion	0	AR	Clear
<b>Rod-Cone Dysplasia 3</b>	PDE6A	Deletion	0	AR	Clear
<b>Sensorineural Deafness (Discovered in the Rottweiler)</b>	LOXHD1	G>C	0	AR	Clear
<b>Sensory Ataxic Neuropathy</b>	tRNATyr	Deletion	0	MT	Clear
<b>Sensory Neuropathy</b>	FAM134B	Insertion	0	AR	Clear
<b>Severe Combined Immunodeficiency (Discovered in Frisian Water Dogs)</b>	RAG1	G>T	0	AR	Clear
<b>Severe Combined Immunodeficiency (Discovered in Russell Terriers)</b>	PRKDC	G>T	0	AR	Clear
<b>Shaking Puppy Syndrome (Discovered in the Border Terrier)</b>	Confidential	-	0	AR	Clear
<b>Skeletal Dysplasia 2</b>	COL11A2	G>C	0	AR	Clear
<b>Spinocerebellar Ataxia (Late-Onset Ataxia)</b>	CAPN1	G>A	0	AR	Clear
<b>Spinocerebellar Ataxia with Myokymia and/or Seizures</b>	KCNJ10	C>G	0	AR	Clear
<b>Spondylocostal Dysostosis</b>	HES7	Deletion	0	AR	Clear
<b>Spongy Degeneration with Cerebellar Ataxia (Discovered in Belgian Malinois - SDCA1)</b>	KCNJ10	T>C	0	AR	Clear
<b>Spongy Degeneration with Cerebellar Ataxia (Discovered in Belgian Malinois - SDCA2)</b>	ATP1B2	Insertion	0	AR	Clear
<b>Stargardt Disease (Discovered in the Labrador Retriever)</b>	ABCA4	Insertion	0	AR	Clear

## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>Startle Disease (Discovered in Irish Wolfhounds)</b>	SLC6A5	G>T	0	AR	Clear
<b>Startle Disease (Discovered in the Miniature American Shepherd)</b>	Confidential	-	0	AR	Clear
<b>Succinic Semialdehyde Dehydrogenase Deficiency (Discovered in the Saluki)</b>	ALDH5A1	G>A	0	AR	Clear
<b>Thrombopathia (Discovered in the Basset Hound)</b>	RASGRP1	Deletion	0	AR	Clear
<b>Thrombopathia (Discovered in the Eskimo Spitz)</b>	RASGRP1	Insertion	0	AR	Clear
<b>Trapped Neutrophil Syndrome</b>	VPS13B	Deletion	0	AR	Clear
<b>Van den Ende-Gupta Syndrome</b>	SCARF2	Deletion	0	AR	Clear
<b>von Willebrand's Disease, type 1</b>	VWF	G>A	0	AD	Clear
<b>von Willebrand's Disease, type 2</b>	VWF	T>G	0	AR	Clear
<b>von Willebrand's Disease, type 3 (Discovered in the Kooiker Hound)</b>	VWF	G>A	0	AR	Clear
<b>von Willebrand's Disease, type 3 (Discovered in the Scottish Terrier)</b>	VWF	Deletion	0	AR	Clear
<b>von Willebrand's Disease, type 3 (Discovered in the Shetland Sheepdog)</b>	VWF	Deletion	0	AR	Clear
<b>X-Linked Ectodermal Dysplasia</b>	EDA	G>A	0	XR	Clear
<b>X-Linked Hereditary Nephropathy (Discovered in the Navasota Dog)</b>	COL4A5	Deletion	0	XR	Clear
<b>X-Linked Hereditary Nephropathy (Discovered in the Samoyed)</b>	COL4A5	G>T	0	XR	Clear
<b>X-Linked Myotubular Myopathy</b>	MTM1	C>A	0	XR	Clear
<b>X-Linked Progressive Retinal Atrophy 1</b>	RPGR	Deletion	0	XR	Clear
<b>X-Linked Progressive Retinal Atrophy 2</b>	RPGR	Deletion	0	XR	Clear
<b>X-Linked Severe Combined Immunodeficiency (Discovered in the Basset Hound)</b>	IL2RG	Deletion	0	XR	Clear

# Hirka

Breed: Alaskan Malamute  
Microchip number: 578099200019194  
Birth date: 2023-06-04

Registration number: NO48183/23  
Test date: 2025-02-11  
ID kit: DSPXMKT



## Other health conditions tested

Genetic Condition	Gene	Risk Variant	Copies	Inheritance	Result
<b>X-Linked Severe Combined Immunodeficiency (Discovered in the Cardigan Welsh Corgi)</b>	IL2RG	Insertion	0	XR	Clear
<b>X-Linked Tremors</b>	PLP1	A>C	0	XR	Clear
<b>Xanthinuria (Discovered in a mixed breed dog)</b>	Confidential	-	0	AR	Clear
<b>Xanthinuria (Discovered in the Cavalier King Charles Spaniel)</b>	Confidential	-	0	AR	Clear
<b>Xanthinuria (Discovered in the Toy Manchester Terrier)</b>	Confidential	-	0	AR	Clear

## Glossary of genetic terms

### Test result definitions

**At Risk:** Based on the disorder's mode of inheritance, the dog inherited a number of genetic variant(s) which increases the dog's risk of being diagnosed with the associated disorder.

**Carrier:** The dog inherited one copy of a genetic variant when two copies are usually necessary to increase the dog's risk of being diagnosed with the associated disorder. While carriers are usually not at risk of clinical expression of the disorder, carriers of some complex variants may be associated with a low risk of developing the disorder.

**Clear:** The dog did not inherit the genetic variant(s) associated with the disorder and will not be at elevated risk of being diagnosed with the disorder due to this genotype. However, similar clinical signs could develop from different genetic or clinical causes.

**Inconclusive:** An inconclusive result indicates a confident call could not be made based on the data for that genetic variant. Health testing is performed in replicates, and on occasion the outcomes do not agree. This may occur due to an unusual sequence of DNA in the region tested, multiple cell genotypes present due to chimerism or acquired mutations, or due to quality of the DNA sample.

### Inheritance mode definitions

**Autosomal Recessive (AR):** For autosomal recessive disorders, dogs with two copies of the genetic variant are at risk of developing the associated disorder. Dogs with one copy of the variant are considered carriers and are usually not at risk of developing the disorder. However, carriers of some complex variants grouped in this category may be associated with a low risk of developing the disorder. Dogs with one or two copies may pass the disorder-associated variant to their puppies if bred.

**Autosomal Dominant (AD):** For autosomal dominant disorders, dogs with one or two copies of the genetic variant are at risk of developing the associated disorder. Inheriting two copies of the variant may increase the risk of development of the disorder or cause the condition to be more severe. These dogs may pass the disorder-associated variant to their puppies if bred.

**X-linked Recessive (XR):** For X-linked recessive disorders, the genetic variant is found on the X chromosome. Female dogs must inherit two copies of the variant to be at risk of developing the condition, whereas male dogs only need one copy to be at risk. Males and females with any copies of the variant may pass the disorder-associated variant to their puppies if bred.

**X-linked Dominant (XD):** For X-linked dominant disorders, the genetic variant is found on the X chromosome. Both male and female dogs with one copy of the variant are at risk of developing the disorder. Females inheriting two copies of the variant may be at higher risk or show a more severe form of the disorder than with one copy. Males and females with any copies of the variant may pass the disorder-associated variant to their puppies if bred.

**Mitochondrial (MT):** Unlike the two copies of genomic DNA held in the nucleus, there are thousands of mitochondria in each cell of the body, and each holds its own mitochondrial DNA (mtDNA). Mitochondria are called the "powerhouses" of the cell. For a dog to be at risk for a mitochondrial disorder, it must inherit a certain ratio of mtDNA with the associated variant compared to normal mtDNA. mtDNA is inherited only from the mother.