

# British Shorthair Autoimmune Lymphoproliferative Syndrome (ALPS)

## About the disease

British Shorthair ALPS is a non-neoplastic, lymphoproliferative disease characterised by an accumulation of immune cells in the lymph nodes and spleen, which results in these tissues becoming dramatically enlarged. The disease presents at an early age (6-8 weeks) and progresses rapidly (2-3 weeks) when the kittens show abdominal distension, anaemia, lethargy and weight loss. Affected kittens either die or are euthanised within a short time (4 weeks) of presentation.



Recently a mutation has been found<sup>1</sup> in the *FASL* gene that has been associated with BSH ALPS. Two copies of the mutation (one from each parent) are required for kittens to develop ALPS, hence it is important not to mate two cats carrying the ALPS mutation. There is currently no evidence that cats only carrying the ALPS mutation (i.e. heterozygous) suffer any clinical disease.

The disease is not common and, to date, has only been identified in BSH cats<sup>1</sup>. It is thought that the disease originated in BSH cats from Australia or New Zealand<sup>2</sup>. Hence, BSH cats imported from these countries, and their offspring, are at risk of carrying the ALPS mutation.

<sup>1</sup>Aberdein D, Munday JS, Gandolfi B, Dittmer KE, Malik R, Garrick DJ, Lyons LA & 99 Lives Consortium (2017). A FAS-ligand variant associated with autoimmune lymphoproliferative syndrome in cats. *Mammalian Genome* 28, 47-55.

<sup>2</sup>Aberdein D, Munday JS, Fairly RA, Vernau W & Thompson KG (2015). A novel and likely inherited lymphoproliferative disease in British Shorthair kittens. *Veterinary Pathology* 52, 1176-1182.

## Reception Hours

Mon-Fri 9am - 5pm

## Contact Us

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## About the test

At the Molecular Diagnostic Unit, we have developed a PCR-based pyrosequencing assay to quickly and accurately identify the *FASL* mutation that causes BSH ALPS.

This assay will allow breeders to identify Carrier cats, particularly amongst those imported from Australia or New Zealand, and therefore prevent Carrier to Carrier matings, which could result in ALPS affected kittens being born.

## Interpretation of results

A **Normal** result on the BSH ALPS genetic assay means that the cat does not have the *FASL* genetic mutation.

A **Carrier** result on the BSH ALPS genetic assay means that the cat carries one copy of the *FASL* genetic mutation. This cat is a Carrier of ALPS and will not develop the disease, but can pass the mutation to its offspring.

An **Affected** result on the BSH ALPS genetic assay means that the cat has two copies of the *FASL* genetic mutation and will be affected by ALPS.

Each certificate we issue will specify whether the cat is Normal, Carrier or Affected for the BSH ALPS mutation.

The gene test will help breeders decide whether or not to use cats for breeding. There is a 25% probability of two Carrier (Heterozygous) cats producing affected (Homozygous) kittens. Breeding Carrier and Normal cats will produce around 50% Normal and 50% Carrier kittens.

This strategy can be used as part of a breeding programme to gradually eliminate the defective gene from the BSH population.

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## FAQs

### What are the genetics of breeding?

		Carrier	
		+	-
Carrier	+	<b>+/+</b> Affected	<b>+/-</b> Carrier
	-	<b>+/-</b> Carrier	<b>-/-</b> Normal

### Autosomal Recessive

BSH ALPS is inherited as an autosomal recessive trait, meaning that two copies of the defective gene are required in a cat to produce the disease.

Carrier cats (those with a single copy of the defective gene; Heterozygous) are not affected. However, breeding from two Carrier cats has a 25% chance of producing Affected kittens, a 25% chance of producing Normal kittens and a 50% chance of producing more Carrier cats.

Therefore, it is NOT recommended to breed two Carrier cats together, since this can produce Affected kittens.

### What do I do with a Carrier?

		Carrier	
		+	-
Normal	-	<b>+/-</b> Carrier	<b>-/-</b> Normal
	-	<b>+/-</b> Carrier	<b>-/-</b> Normal

### Breeding is still possible

It is possible to continue to use Carrier cats in breeding programmes to retain important breeding lines and to avoid reducing the size of the gene pool.

As long as Carrier cats are mated to Normal cats no Affected kittens will be produced. This mating is likely to produce kittens that are Carriers, which can be identified by genetic testing and, if necessary, future matings arranged with Normal cats.

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