

Pug Dog Encephalitis Susceptibility (PDE)

Affected breeds: Pug

PDE is an inflammatory condition of the nervous system which affects approximately 1% of the pug population. The symptoms include seizures, depression, changed behaviour, circling and visual impairment. Often the condition develops in young dogs of 18 months – 2 years of age, although the age of onset varies. There is little hope for affected dogs, with euthanasia the only option due to uncontrollable seizures.



Research has shown that PDE is associated with a region of the genome known as the DLA, which is involved in immunity. Pugs with two copies of the PDE-associated markers have a much increased risk of developing PDE.

This test is particularly useful for breeders:

- To identify dogs which have the PDE-associated markers and are at risk of passing these on to offspring.
- This test should not be used to diagnose PDE, only to identify dogs which risk passing on the PDE-associated markers. Although 11% of pugs are S/S, only about 1 in 8 of these will develop PDE.
- Breeders should not exclude N/S pugs from breeding as these account for about 1/3 of the population. Excluding them from breeding would restrict the genepool. Breeders should instead choose breeding combinations to avoid S/S offspring (listed in black below).

This test will be reported as:

N/N : No copies of the PDE-associated markers. These dogs have a low risk of developing PDE.

N/S : 1 copy of the PDE-associated markers. These dogs have a low risk of developing PDE.

S/S : 2 copies of the PDE-associated associated markers. These dogs are 13 times more likely to develop PDE in their lifetime.

The genetic status of dogs can be used to predict breeding outcomes when different combinations are mated:

N/N X N/N = 100% N/N

N/S X N/N = 50% N/S, 50% N/N

S/S X N/N = 100% N/S

N/S X N/S = 25% S/S, 50% N/S, 25% N/N

S/S X N/S = 50% S/S, 50% N/S

S/S X S/S = 100% S/S

References

Pedersen N, Liu H, Millon L, Greer K (2011) Dog leukocyte antigen class II-associated genetic risk testing for immune disorders of dogs: simplified approaches using Pug dog necrotizing meningoencephalitis as a model. J Vet Diagn Invest. 23(1):68-76.