

## **The AHT's *GIVE THE DOG A GENOME* project and the Norfolk Terrier**

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At the 2016 AGM of the NTCGB it was proposed and passed that the Club applies for a place on this project, as well as allocate £2000 from the Barbara Waddington Fund for it. The Animal Health Trust, who is running the project in conjunction with the Kennel Club, acquired sufficient funding for this very expensive work so that breed clubs would need to pay only £1000, a fraction of what it actually costs. The remainder of the amount approved at the AGM is there for contingency expenses that may arise, or any further genetic work that may need to be done in the immediate wake of the project.

We can announce that we have been accepted for the 2017 phase of the project, and will be invoiced in 2017.

### **What is a Genome?**

A *Genome* is all of a living thing's (animal or vegetable) genetic material. Genetic material is the entire set of hereditary instructions for building, running, and maintaining a living thing, and passing life, and its blueprint, on to the next generation.

Studying the genome can mean many different things. Scientists can study a very small part of the genome or the genome as a whole, depending on what that individual dog, or the breed as a whole, requires. They can study the sequence of a gene, the function of a gene, the parts of the genome that regulate genes, or the DNA outside of genes. They can observe where genes are located in the genome, or investigate how different genes work together. And how all of this might result in a healthy or unhealthy Norfolk Terrier.

The BBC has a short film explaining what a genome is. It can be found at this link:

[www.bbc.co.uk/news/science-environment-10958995](http://www.bbc.co.uk/news/science-environment-10958995)

### **What does it mean for the dog?**

Everything is genetic, even good health. Genes can be 'protective', which is why some smokers live to a ripe old age. Geneticists are keen to know, however, what single gene or set of genes cause, or contribute, to disease in the dog/breed, whether it is hereditary or not, and the mode of that inheritance. Not all 'bad' genes are expressed in the living dog, but can lay hidden to surprise us as the genetic pool expands or contracts, or when a new stud dog from abroad is used.

We understand that genes are not always 'expressed', and respond to 'environmental pressures', including stress, obesity, other diseases, toxins, pollution, and so on.

When a breed's entire Genome is on record, as we hope for the Norfolk Terrier, that record can be examined for many things now and in the future. Already we have genetic tests for many diseases in the dog, and these tests are done routinely in many breeds. The Kennel Club website lists some of them. With this knowledge in hand, the breeder will know whether to go ahead with a particular mating or not, and can seek advice from vets and geneticists as to the wisdom of their choices of dams and sires. The living dog can be tested for a particular gene (or set of genes) or not, and its disease treated or prevented. Please beware of commercially available tests not approved in the UK, by the way. We are, right now, on the threshold of being able to 'flick' genetic 'switches' on or off in the individual animal/human. I remember, around 10 years ago, a molecular biologist friend saying that this would happen, and he was right.

### **What does it mean for the Norfolk Terrier?**

We are blessed with a breed that has no genetic and hereditary diseases specific to it, or occurring in numbers that warrant specific attention. Our Breed Health Survey of 2014 confirmed this. Both the survey form and the results are available on the Club website.

Having the genome of the Norfolk Terrier on record means that we may be able to sit back and say '*our genome shows we don't have X disease in our breed*' or '*our genome shows we have to look out for X in any matings*' or '*this is why some of them have or do X*', and so on.

### **Which dog or dogs will be chosen?**

This is the statement from the Animal Health Trust on the question:

*We will now begin a dialogue with each Breed regarding the choice of dog for sequencing.*

*We will begin by asking breed health co-ordinators to provide information about their breed's main health concerns. This will enable us to collate information from all the participating breeds and to decide if it will be more valuable to sequence a dog that is either affected with an inherited disorder of concern to the breed or an older, healthy dog, on a breed by breed basis. The final choice of dogs whose genomes are sequenced will be made by the Animal Health Trust and the identity of all dogs will be kept confidential.*

### **Conclusion**

We are fortunate to be offered this opportunity, and we are right to avail ourselves of it. It will produce huge amounts of information, and maybe even provide reassurance. The Club will keep its members up to date on the project.