



Animal **Health** Trust
Oncology Research Group

Genetic study on the predisposition of Irish Wolfhounds to developing osteosarcomas

Osteosarcoma is the most common bone cancer of dogs. The tumours usually develop in the long bones of the legs close to the joints, such as by the stifle, or close to the shoulder joint. The early signs of osteosarcoma are lameness and pain (which may be intermittent), limb swellings and fractures at the tumour site. The tumour is extremely malignant and for more than 90% of affected animals, which do not receive chemotherapy following limb amputation, the cancer will spread (usually to the lungs), and life expectancy varies from a few weeks to 3-6 months. However, 40-60% of dogs that do receive chemotherapy survive for 12 months, and indeed half of these survive long term.

Osteosarcoma is associated with increasing height (and weight) and therefore the highest incidence is in large and giant breeds. However, some families within these breeds are particularly susceptible, suggesting an inherited predisposition. In 2006, a UK Kennel Club/British Small Animal Veterinary Association Purebred Dog Health Survey (<http://www.thekennelclub.org.uk/item/549>) reported that osteosarcoma was the most common cause of death of Irish Wolfhounds in the UK. The inherited susceptibility to developing osteosarcoma probably results from the combined effects of a number of gene defects, each of which alone, confers a low to moderate increase in risk. The risk of developing cancer is thought to increase according to the number of altered genes carried.

With the support in the UK of The Irish Wolfhound Society and The Irish Wolfhound Club and their members, since June 2005 we have been collecting samples from Wolfhounds to enable a study of the genetics of this disease. We wish to identify the genes that, when mutated, are associated with the increased risk of Wolfhounds developing osteosarcomas. In the long term, we hope that the research will lead to the development of tests to identify dogs that carry the gene mutations conferring an increased risk, allowing breeders to take this into consideration in their breeding programmes. A realistic objective would be to attempt to reduce the incidence of dogs affected with osteosarcoma. Identification of 'osteosarcoma susceptibility genes' will also improve our understanding of how these tumours develop, thereby ultimately assisting the development of new therapies.

In order to identify the genes that are associated with osteosarcoma susceptibility, we will compare Wolfhounds with cancer and unrelated dogs, which are not affected by the disease. We need to collect samples from large numbers of Wolfhounds that have osteosarcoma, and Wolfhounds (preferably at least 5 years old) that do not have bone cancer. As osteosarcoma shares common clinical signs with other conditions, diagnosis must be confirmed by limb X-ray and histopathological examination of a biopsy of the suspected tumour. The 'osteosarcoma susceptibility genes' are contained in dogs' chromosomes (which are made of DNA). DNA can be isolated from cells collected using a swab from the inside of a dog's cheek, or preferably from a small volume of blood collected by a vet.

We recently applied to a large animal welfare organisation for the funds that will allow us to begin the research study. We successfully negotiated the first phase of the application process, and have just submitted a full grant application. We will also shortly be seeking funds from another funding organisation, and so we are confident that we will soon be able to start the research study.

We still need the help of Irish Wolfhound breeders and owners to collect samples. The more samples from Wolfhounds with osteosarcoma that we are able to collect the more likely it is that our study will be successful. If you will allow your vet to take a small sample of blood (1 - 5ml in an EDTA tube) for our research project, please complete a sample submission form and send it with the blood sample to the AHT (at the address below). Alternatively, if you would like to receive a cheek swab kit with which you can collect some cells from the inside of your dog's mouth, please complete a cheek swab kit request form and send it to the AHT.

Dr Mike Starkey
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Please send samples and forms to:

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What is the Animal Health Trust?

The Animal Health Trust is a charity that has been helping dogs, cats and horses for more than half a century. The AHT provides specialist veterinary clinical, diagnostic and surgical services, and is dedicated to the study of canine, equine and feline diseases. The AHT multidisciplinary Oncology Research Group (http://www.aht.org.uk/science_oncology.html) is currently investigating many different aspects of a number of the most common cancers of dogs and cats. We do not use any experimental animals in our research, but rather, we rely on obtaining samples that are collected from patients (with naturally occurring cancers) by veterinary surgeons as part of the normal diagnostic clinical procedures.