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Renal Research Project

The aim of this research project has been to investigate the heritability of renal dysplasia in the Cairn terrier breed. We have also sought out the degree to which genetics influence the severity of disease - whether it is mild, moderate, or severe - and the degree of relatedness between renal dysplasia and aplasia. Upon examination of several pedigrees, we have assessed the familial ties of over 1500 individuals, 1041 of which could be represented on a single pedigree. Within the population of dogs involved in the study, there are 31 Cairns that have ultrasonographic changes on the kidney that are consistent with renal dysplasia. Twenty three of the 31 affected animals have been directly linked to a single common ancestor. Parentage information has not yet been provided for 7 of the 8 remaining affected individuals; therefore, their relation to the aforementioned common ancestor has not yet been evaluated. In addition to gathering further familial data, we are currently analyzing subsets of the larger pedigree in the hopes of identifying a likely mode of inheritance for renal dysplasia in Cairn terriers.

Update

According to patterns illuminated by the pedigree, renal dysplasia (RD) seems to be most consistent with an autosomal recessive mode of inheritance. However, there are likely some additional factors influencing the expression of disease (such factors potentially include environment, epigenetics, etc.). We have received pedigree information for approximately 15 additional Cairn terriers in our database. In addition to this, we have also acquired approximately 10 additional DNA samples (some new cases and some preexisting cases previously without DNA samples). At present, we have 331 DNA as of 4/30/18 (236 normal, 15 with mild RD; 10 moderate RD, 2 of which have only one kidney: and 3 severe RD, 1 of which has only one kidney). We have set aside select samples, which include samples from all Cairns with all three grades of renal dysplasia and several normal Cairns 5 years of age and older as controls to be submitted for SNP genotyping. SNP (single nucleotide polymorphism) genotyping is a method of scanning several

sites across the genome to look for differences and commonalities in the DNA sequence of different individuals. The SNP chip will allow us to see a series of snap-shots of the genetic code so that we can hopefully get a general picture of areas of the genome that are suitable for markers of renal dysplasia in Cairn terriers. We are excited to see the outcome of our next steps.

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