WINN FELINE FOUNDATION
For the Health and Well-being of All Cats

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SEARCHING FOR BREED GENETICS OF FELINE AMYLOIDOSIS

PROJECT STUDY: Feline amyloidosis in Siamese/Oriental cats and in Abyssinian/Somali cats

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Interim report summary, W18-040

This project funded the study of Feline Amyloidosis in Siamese/Oriental (Sia/OSH) and includes the continuation of the study on the same disease in Abyssinian/Somali (Aby).
An effort has been performed by University of Missouri and University of Milan with the collaboration of many institutions, breeders and owners world-wide to collect samples in Sia/OSH and Aby. In Abyssinians, with the previous help by Winn Feline Foundation (WFF: W16-028; MTW15-017; W10-014) the proteome of pathological renal tissues and normal controls and whole genome sequencing (WGS) of two affected (together with dozens of control WGS out of the 99 Lives project) were analyzed.

Overall, amyloidosis in Abys resulted in not monogenic (one gene mutation) and the protein mix formatting the not-soluble deposits were not determined by mutated amyloidogenic proteins. The current project (WFF18-040) allows the epigenetic analysis on the miRNAome in the same tissue specimens allowed to match the three "omic" data (genomic, proteomic, miRNAomic), obtaining a deeper cellular panorama of some genetic and epigenetic mechanisms working in the affected kidney compared to the not affected one. Those processes' results were in common with those involved in the intracellular amyloid formation in Alzheimer's disease in man. Moreover 20 new cat specific miRNA genes have been identified, improving the feline genome annotation.

In Sia/OSH, the release of the new improved feline genome reference sequence (vs 9.2) during the present project processing, and the new analysis performed in present work increased the number of DNA variants identified in affected cats compared to the healthy cats. The incoming availability of a new affected WGS Oriental cat and a new high-density DNA array (developed at the Lyons lab), suggest a delay to the variant prioritization and genotyping that are planned in the next months, when both the new WGS and array will be available. Meanwhile, in the context of the present project, the proteomic characterization of the protein deposits in livers of affected SIA/OSH compared to the proteomic composition of normal livers in healthy cats of the same breed, was performed. In the deposits, 27 proteins were exclusively present and 263 missing, compared to normal tissues. The proteomic data analysis will be completed and integrated with the genomic results when available.

Summary prepared for Winn Feline Foundation © 2019

An extension of the project has been requested and approved. A manuscript is in preparation.