



WINN FELINE FOUNDATION

For the Health and Well-being of All Cats

637 Wyckoff Ave., Suite 336, Wyckoff, NJ 07481 • www.winnfelinefoundation.org

Toll Free 888-9MEOWIN (888-963-6946) • Local Phone 201-275-0624 • Fax 877-933-0939

ANALYZING THE EFFECTS OF ANTIBIOTICS ON INTESTINAL MICROBIOTA OF KITTENS

PROJECT STUDY: Metagenomic and metabolomic analysis of the short-term and long-term effects of antibiotic therapy on the intestinal microbiota in growing kittens and their relation to the overall health status of these kittens

Principal Investigators: JS Suchodolski, JM Steiner, EM Stavroulaki; Texas A&M University; PG Xenoulis; Thessaly University

Interim report summary, MT18-003

A total of seventy kittens were enrolled during the first six months of this study. Based on the research proposal, a total of forty-five kittens are required for the study. However, additional kittens were initially enrolled to compensate for possible dropouts during follow up. So far, seventeen out of seventy kittens have dropped out of the study due to: unrelated illness that required treatment, death, antibiotic administration during castration/neutering, and owner noncompliance. Of the remaining kittens, the majority have already completed the study, while the rest are still in the study. For these kittens still in the study, four of the five samples required for the study have already been collected and there remains one final sample to be collected.

Fecal samples that were obtained until January of 2019 have been already analyzed with quantitative PCR analysis. These samples came from forty-four kittens and included the first 3 timepoints (day 0, day 20 or 28, and day 60). The analysis used detects and quantifies the DNA from specific bacteria. These bacteria have been associated with a disrupted intestinal microbiota (called intestinal dysbiosis) and gives a picture of how these bacteria are affected by antibiotic treatment. Results showed that some potentially pathogenic bacteria increased during and after the end of antibiotic treatment, whereas other beneficial bacteria, that produce useful substances for the host, decreased during antibiotic treatment. The changes in the numbers of bacteria persisted for at least one month after antibiotic withdrawal (the last available sample at that point was the sample collected one month after antibiotic treatment). Interestingly, each antibiotic had different effect on certain bacteria tested. Amoxicillin/clavulanic acid caused immediate shifts in more bacteria, while doxycycline caused shifts in fewer bacteria that were more evident one month after antibiotic withdrawal. Results from this part of the study were reported as oral presentations in two International conferences in Europe: the 1st combined Eurogut/CGS meeting in Barcelona, Spain, in May 2019 (the major meeting on Gastroenterology in animals) and the 29th European Congress of Veterinary Internal Medicine, in Milan, Italy, in September 2019.

Since January 2019, fecal samples from additional kittens and additional timepoints have been collected. In fact, out of the 225 fecal samples that need to be collected for the study, 202 have already been collected, while the remaining 23 samples will be collected by March 2020. The DNA from all the samples that are

637 Wyckoff Ave., Suite 336, Wyckoff, NJ 07481 • info@winnfelinefoundation.org

Phone 201.275.0624 • Fax 877.933.0939 • www.winnfelinefoundation.org

The Winn Feline Foundation is a non-profit organization [501(c)(3)] established by The Cat Fancier's Association.
Member Combined Federal Campaign #10321



WINN FELINE FOUNDATION

For the Health and Well-being of All Cats

637 Wyckoff Ave., Suite 336, Wyckoff, NJ 07481 • www.winnfelinefoundation.org
Toll Free 888-9MEOWIN (888-963-6946) • Local Phone 201-275-0624 • Fax 877-933-0939

available so far has been extracted, and quantitative PCR has been performed. Therefore, results are available for all timepoints for the majority of kittens. The results are now being analyzed and will be submitted for presentation at the 2020 American College of Veterinary Internal Medicine Forum in Baltimore, Maryland in June.

In addition to collecting samples, clinical data from these kittens are recorded at each sampling timepoint. In addition, a detailed history regarding clinical signs or pathologic conditions that appeared during the previous weeks or months is taken. This is done to determine whether antibiotic administration and antibiotic-induced dysbiosis in young kittens is associated the development of pathologic conditions later in life (such as obesity or episodes of diarrhea or vomiting).

Two additional sets of analyses will be performed. The in-depth analysis of the intestinal microbes (called metagenomics) and the in-depth analysis of the substances produced by these microbes (called metabolomics). The investigators will perform metabolomic analysis in both blood samples (as initially planned) and fecal samples. This will give a much more complete and detailed picture of the disrupted function of the microbiome during and after antibiotic use, as different metabolites might be found in the feces compared to blood. The analysis is expected to be completed by fall of 2020.

Presentations:

1. EM Stavroulaki, JS Suchodolski, JA Lidbury, JM Steiner, PG Xenoulis. Impact of antibiotic administration on fecal bacterial groups potentially associated with dysbiosis in kittens. 29th Conference of European College of Veterinary Internal Medicine, 19-21 September 2019, Milan, Italy (Oral presentation)
2. EM Stavroulaki, JS Suchodolski, JA Lidbury, JM Steiner, PG Xenoulis. Impact of antibiotic administration on fecal bacterial groups potentially associated with dysbiosis in kittens. EuroGutSea, May 22-25 2019, Barcelona, Spain (Oral presentation)

Summary prepared for Winn Feline Foundation © 2020

637 Wyckoff Ave., Suite 336, Wyckoff, NJ 07481 • info@winnfelinefoundation.org
Phone 201.275.0624 • Fax 877.933.0939 • www.winnfelinefoundation.org

The Winn Feline Foundation is a non-profit organization [501(c)(3)] established by The Cat Fancier's Association.
Member Combined Federal Campaign #10321
