



# WINN FELINE FOUNDATION

For the Health and Well-being of All Cats

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637 Wyckoff Ave., Suite 336, Wyckoff, NJ 07481 • [www.winnfelinefoundation.org](http://www.winnfelinefoundation.org)  
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## TOWARDS CANCER PREVENTION IN CATS

**PROJECT STUDY:** Towards cancer prevention in cats: FcaGHV1 gene expression analysis in feline Lymphoma

Principal Investigators: Professor Julia Beatty, Dr. Mahdis Aghazadeh, Professor Vanessa Barrs; University of Sydney, New South Wales, Australia

*Final report summary, W17-011*

The number of pet cats being diagnosed with lymphoma, the most common malignant cancer of cats, is increasing. With few exceptions, cats diagnosed with lymphoma will endure suffering and premature death. To improve outcomes for feline lymphoma patients we strive to better understand the causes of lymphoma and other cancers.

Viruses cause 20% of human cancers and it is likely that viruses play a role in more cancers of pets than is currently realized. The identification of cancer-causing viruses in cats provides a unique opportunity to design cancer treatments with less-side effects and to achieve the ultimate goal, cancer prevention through vaccination.

Since 2013, the investigators' laboratory has identified three novel candidate cancer-causing viruses in cats, a gammaherpesvirus, a hepadnavirus and a papillomavirus. This study focused on the feline gammaherpesvirus, FcaGHV1. Understanding whether FcaGHV1 causes cancer in cats is a research priority. We know that in other species infected with similar viruses, the virus causes fatal lymphomas but only in a small percentage of infected animals. So the risk to an individual is small. But given that an estimated 200 million cats worldwide are infected with FcaGHV1, the virus could currently be responsible for a great many cases of lymphoma in total.

In this study, the investigators took the approach that if they could find the genetic material of the virus, FcaGHV1, within the cancer cells themselves, then the virus could be playing a role in the development of that cancer. To do this they used a technique called in situ hybridization to test stored diagnostic samples from clinical cases. Because FcaGHV1 is a recently discovered virus, they needed to custom design probes specifically for this virus. The probes recognize and attach to the specific genetic sequence of the virus, FcaGHV1. The attached probe shows up under the microscope as a red colour. So cancer cells that contain a red probe, contain the virus.

The investigators were able to show that in one type of intestinal lymphoma, large granular lymphocyte lymphoma, almost all the cells contained FcaGHV1.

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

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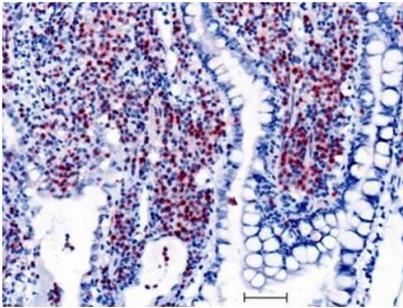
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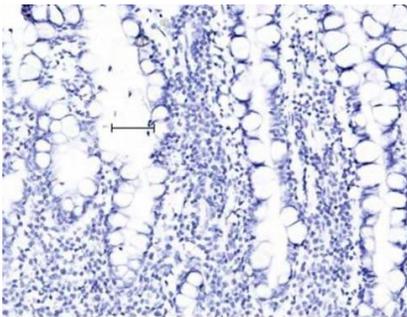
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Intestinal lymphoma cells labelled with a probe for novel feline gammaherpesvirus, FcaGHV1. The cancer cells stain red showing that the virus is present within the cancer cells themselves.



Negative control: The same lymphoma, stained with a probe to an unrelated virus. No staining of the cancer cells, showing that the positive result above is specific for FcaGHV1.



## **Publications:**

Aghazadeh, M., Shi, M., Pesavento, P., Durham, A., Polley, T., Donahoe, S., Troyer, R., Barrs, V., Holmes, E. & Beatty, J. 2018. Transcriptome analysis and in situ hybridization for FcaGHV1 in feline lymphoma. *Viruses*, 10, 464.

*Summary prepared for Winn Feline Foundation © 2020*

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