

HEALTH NEWS

Similar Type of Epilepsy in Cats and Humans

A RECENT STUDY FROM THE UNIVERSITY of Veterinary Medicine in Vienna, Austria, evaluated 17 cats with a sudden onset of complex partial seizures with orofacial (mouth or face) involvement. The feline patients displayed symptoms of salivation, face twitching, lip smacking, chewing, licking or swallowing, as well as motionless staring off into space and behavioral changes. The source of the seizure activity for all the cats in the study was localized to an area of the brain called the hippocampus. This is the same region of the brain that is most implicated in certain

forms of human epilepsy, most notably mesial temporal lobe epilepsy with hippocampal sclerosis (or MTL-ES). Humans with this form of epilepsy have similar symptoms to those of cats.

The underlying cause in cats with this condition has not been identified, but in humans we know there is a strong genetic influence.

Prognosis for feline patients with this condition is unfavorable, with only eight of the cats in the study surviving past initial treatment. The cats who responded to treatment took four to 11 days to stabilize.

They were treated with combinations of anti-convulsant medications and other supportive drugs. The hypothesis was that the feline survivors had less severe changes to their brains than those who failed to respond to initial treatment. The study results showed that treatment could achieve remission, and cats who are treated at an early stage might not develop more severe damage to their brains.

Studies such as this allow researchers to extrapolate knowledge from comparable human diseases and use it to help our feline companions.



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Feline Transgenic Research

FELINE IMMUNODEFICIENCY VIRUS and human immunodeficiency virus are similar viral infections that can lead to potentially fatal acquired immunodeficiency syndrome in both cats and humans. AIDS occurs when HIV or FIV affects and impairs important infection fighting cells in the infected human's or cat's immune system.

FIV and HIV are both lentiviruses (viruses that belong to the genus by that name) and are quite similar; however, they can only infect their respective species. Mayo Clinic researchers have recently investigated the role of proteins called "restriction factors." These proteins prevent the virus from infecting the patient's immune system cells by disabling the virus's outer shield. The natural proteins in feline and human patients do not protect their cells from lentivirus invasion.

A transgenic is an individual who has had genes from another individual inserted into their genetic code (DNA). The researchers devised a way to create a transgenic cat, which is immune to infection by the FIV virus. They inserted a genetic code from a rhesus macaque monkey (TRIMCyp) that encodes for protective restrictive factors into the feline ova (egg) prior to fertilization with sperm. Once born, these cats have the monkey's gene, which encodes for a protective protein that prevents lentivirus invasion. They also inserted the genetic code of a jellyfish (eGFP: Green Fluorescent Protein), which causes the transgenic cats to fluoresce green under certain light. This visible glow enables the researchers to better track the modified genetic codes of the cats and establish whether the genetic codes were passed on to their kittens.

This genetic manipulation is called gamete-targeted transgenesis (a gamete is a reproductive germ cell — a spermatozoon in males and ovum in females), and this is the first time such an effort has been accomplished in a carnivore. These advances in biogenetics allow scientists to research the potential benefits of using restriction factors in gene therapy to help both cats and people.

