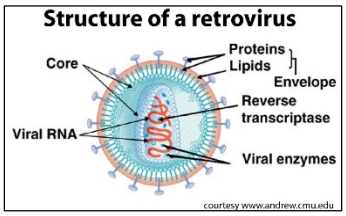
Feline Immunodeficiency Virus - FIV



Model structure of a member of the retrovirus family that includes feline immunodeficiency virus (FIV).

Samples:

Blood	EDTA-blood as is, purple-top tubes or EDTA-blood preserved in sample buffer (preferred)
Notes: Send all samples at room temperature, preferably preserved in sample buffer MD Submission Form	

Interpretation of PCR Results:

Positive (> 10 copies/ml blood)	FIV infection
Negative	FIV not detectable

Feline Immunodeficiency Virus

Feline Immunodeficiency Virus (FIV) is an RNA lentivirus in the same retrovirus family as Feline Leukemia Virus (FeLV) and human immunodeficiency virus (HIV) (Crawford et al., 2005). The virus can infect both domestic cats and wild cats such as cheetahs. FIV infects mainly lymphocytes and integrates itself into the genome of infected cells, from where it is transcribed during replication. FIV attacks and weakens the body's immune system, making the animal susceptible to infections and diseases that usually do not affect healthy cats. FIV is distributed worldwide, and the prevalence of infection is highly variable ranging from 1% in cats at low risk in the USA and Canada to 44% in symptomatic cats in Japan, depending upon factors such as age, gender and indoor or outdoor housing. Older cats are more likely to be infected, and the average age of cats with FIV is 5 years at the time of diagnosis. Free-roaming cats are more likely to be infected than indoor cats. Aggressive male cats that roam and fight with other cats are more likely to be infected than females and non-aggressive males because FIV is a blood-borne pathogen. Sick cats are much more likely to have FIV, and around 15% of cats that show clinical signs of another disease are also infected with FIV in the United States. Currently, FIV isolates are classified into five different subtypes designated A, B, C, D and E (Reggeti & Bienzle, 2004). Subtype A has been reported from California and Northern Europe while subtype B was prevalent in the central and eastern USA and in southern European countries. Subtype C has been identified from California and British Columbia, while subtypes D and E have been reported from Japan and Argentina, respectively (Reggeti & Bienzle, 2004).

Clinical Signs

FIV infection is divided into two stages, including an acute, but clinically asymptomatic phase of variable duration, and a terminal phase of infection often referred to as feline acquired immunodeficiency syndrome. The clinical signs of FIV infection are nonspecific, and in acute experimental infection some cats exhibit fever, malaise, and signs of enteritis, stomatitis, dermatitis, conjunctivitis, and respiratory tract disease, and enlargement of the lymph node. During the late stages of infection, clinical signs are often a reflection of neoplasia, myelosuppression, and opportunistic infections from pathogens of virus, bacteria, protozoal, and fungi.

Standard Diagnostic Methods

Standard diagnostic methods for FIV infection include clinical laboratory findings and serological findings. Most available FIV diagnostic tests detect antibodies to FIV in serum, plasma, or whole blood. ELISA is the FIV test most often used for commercial or in-practice laboratories in North America. Other available serological tests include Western Blot and Immunofluorescent Antibody (IFA) test. The ELISA used in veterinary laboratories has been described as having high sensitivity and specificity. However, false negative results are seen due mostly to acute infection prior to the generation of specific antibodies, and false positive results have been attributed to antibodies following vaccination. Recently, DNA tests for FIV diagnosis based on the detection of nucleic acids by the polymerase chain reaction (PCR) have been introduced (Crawford et al., 2005). These tests offer best confirmation of FIV infection because of their high sensitivity and specificity and because they do not have the shortcoming of FIV antibody detection.

Our Method

The Molecular Diagnostics Laboratory at Auburn University has developed a rapid, highly sensitive and specific quantitative PCR approach targeting the most conserved capsid (gag) gene. The PCR detects as few as single copies of the integrated viral DNA as well as the RNA genome or gag mRNA of FIV subtypes A, B and C. (Wang et al., 2010b). By detecting RNA produced by actively replicating as well as integrated DNA, this PCR offers 10-1,000-fold increased detection over detection of genome-integrated FIV DNA only combined with essentially 100% specificity. Based on known target sequences, subtypes D and E will also be detected, but these targets have not been tested.