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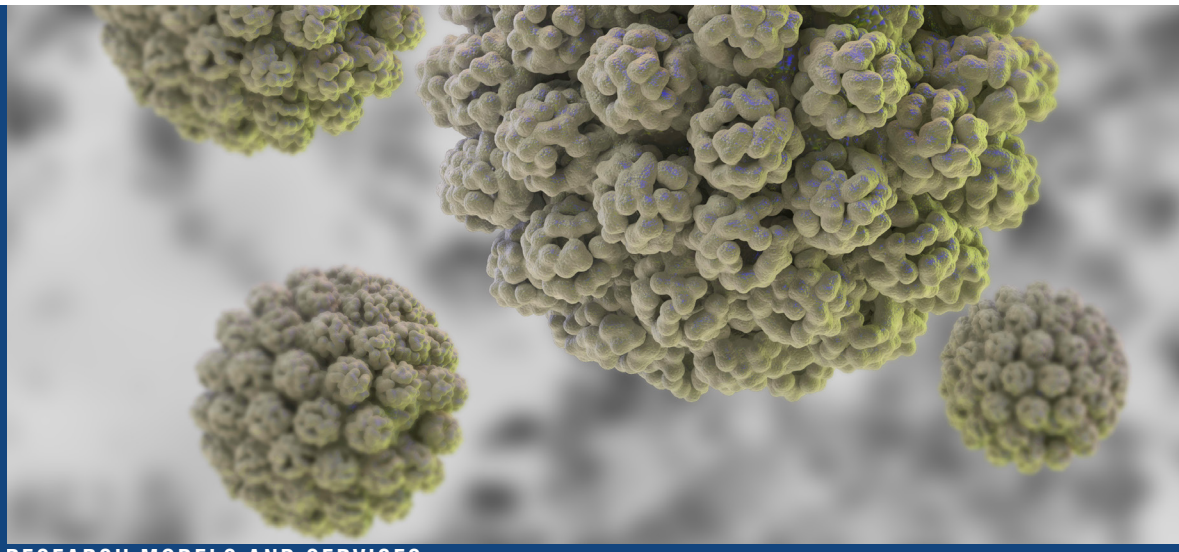
Summary

Transmitted through respiratory route and through direct animal contact. Clinical illness is not common in immunocompetent rats, but rats RPyV2 antibodies can be detected by immunological assays including MFIA, ELISA or IFA. Virus can be detected easily by performing PCR on environmental or EAD samples, feces, body swabs or oral swabs.



Rat Polyomavirus-2 (RPyV2)

Classification

DNA virus, nonenveloped

Family

Polyomaviridae

Affected Species

Rats (*sp. Rattus novegicus*)

Frequency

Antibodies can be detected in laboratory rats with low-medium prevalence, but clinical illness is seen only in immunodeficient rats.

Transmission

Rat polyomavirus-2 (RPyV2) is transmitted through the respiratory route. Naive CD rats co-housed with RPyV2-infected SCID rats in micro isolator cages tested positive by PCR followed by positive seroconversion, thus confirming that it can spread through direct contact in lab animals.

Clinical Signs

No clinical signs are noted in a natural infection with RPyV2 in normal rats; however, clinical respiratory illness signs are seen in immunodeficient SCID and nude rats. Infections in X-linked severe combined immune deficiency (X-SCID) rats shows decreased fecundity, acute respiratory distress (if co-infected with *Pneumocystis carinii*), and disseminated viral inclusion body disease.

Diagnosis

Polyomaviruses are highly immunogenic, and high titers develop rapidly. Antibodies can be detected by MFIA™, ELISA or IFA. Retesting of positive serology results or confirmation by PCR is strongly recommended prior to taking actions that could interrupt ongoing research.

PCR can be used for the detection of RPyV2 DNA by a real-time (i.e., semi-quantitative) 5' nuclease fluorogenic (TaqMan®) polymerase chain reaction assay targeting the RPyV2 VP1 gene. Environmental samples from rooms with open caging or the appropriate exhaust air dust samples from an IVC rack (such as plenum swabs or sentinel cage filters) can be used for PCR. Alternatively, antemortem animal samples comprised of feces, body swabs, and oral swabs (optional) of infected immunodeficient and immune-competent rats may be submitted for PCR testing.

Interference with Research

Current information on RPyV2 infections in immunocompetent rats is limited, though clinical illness is seen in immunodeficient rats.

Prevention and Treatment

Wild rats may also serve as a reservoir of RPyV2 viral infection and access of wild rodents should be controlled. Regular serologic testing of resident animals and quarantine of incoming animals is advised. Aggressive chemical decontamination with the help of detergents and oxidizing disinfectants is advised, as well as autoclaving or cold sterilization of materials in direct contact with animals. Polyomaviruses are stable in the environment, and may persist for longer than two months in tissue suspensions. They withstand freeze-thaw cycles, ether, heat to 70 °C for three hours, and 0.5% formalin. They may be recovered from bedding and, in the case of polyoma, aerosols.

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