

Mouse/ Murine norovirus (MNV)

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23.6.2008

Summary

Noroviruses (e.g. Norwalk virus) have been estimated to cause up to 95 % of nonbacterial gastroenteritis epidemics in humans. MNV is so far the only known norovirus that replicates in cell cultures and in a small-sized animal species. It is therefore a valuable model for studying human noroviruses. MNV does not infect humans and human noroviruses are not known to infect mice.

The first mouse norovirus found, MNV-1, was described in 2003. MNV is at the moment the most common known viral pathogen of mice in laboratory animal facilities worldwide.

Noroviruses are primarily intestinal pathogens. Generally the infection is nonsymptomatic in immunocompetent mice and they shed the virus for a limited time.

The innate unspecific immune response limits the spread of noroviruses in the body and prevents clinical disease. Adaptive microbe-specific immune response, especially B and T cells, is needed to eliminate viruses from the system.

Defect of the innate immune response causes spreading of the virus in the system, but not fatal disease. Defect in the adaptive immune response causes a permanent infection and continuous spreading of the virus. In STAT1 ^{-/-} mice, that have defects in both innate and adaptive immune systems, MNV-1 causes a fatal generalized disease.

MNV has tropism to hematopoietic cell lines, especially macrophages and dendritic cells which MNV-1 infects *in vivo*. MNV can also contaminate biological materials like cell cultures, transplantable tumors etc.

Noroviruses may replicate continuously also in wild type mice, which can act as a reservoir for epidemics.

From the scientific research point of view MNV is harmful especially in studies of the immune system. However, all its properties are not known, and it cannot be said for certain that there are no other effects on research.

MNV is very durable in the environment and it's elimination from a contaminated animal unit is difficult. Rederivation through embryo transfer seems possible. Cleaning a unit successfully without complete emptying and disinfection before taking new animals in is extremely difficult and unreliable.

Reference

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