

Mouse Adenovirus (MAdV-1, MAdV-2, MAD)

Family: Adenovirus

Prevalence

Infects mice only - rare in contemporary laboratory animal colonies.

Significance

- Significance is low
- Resistant to ether and acid pH
- Stable for over 2 months at 4°C, 2 weeks at room temp and 1 week at 37°C
- Inactivated at 50°C for 15 minutes
- Fatal systemic disease can occur in neonate mice – born to mothers without antibody
- Virus inoculation in neonate, suckling, and immunodeficient mice (MAdV-1) result in viremia and fatal systemic (infection within 10 days)
- An increase in susceptibility to *E.Coli*-induced pyelonephoritis has been seen in MAdV-1

Disease

- Non-enveloped DNA virus
- Sub-clinical in mice infected with MAdV-2:
 - Runtling seen in suckling mice in natural infections
 - May cause wasting in nude mice
- Replication occurs in the intestine
- Mice infected are used as models for human disease (Addison's Disease)
- MAdV-1:
 - Seen in adrenal glands
 - Infects macrophage lineage, vascular endothelial cells, and renal tubular cells
 - Inoculates in mice develop runtling, dehydration, thymine involution and necrosis in spleen, and liver
- MAdV-2:
 - Occurs in the small intestine and cecum
 - No lesion show in experiment rats infected with MAdV-2

Transmission

- Transmitted through feed-oral route
- MAdV-1 transmitted through direct contact, nasal secretions, faeces, and urine
MAdV-2 shed in faeces

Isolation and Diagnosis

- Preferred - ELISA testing of serum or DBS samples used to screen colonies:
 - Confirmation with fluorescent immunoassay (IFA)
- PCR on tissue is possible

Strains

- Two known mouse strains:
 - FL (Adenovirus type 1/MAdV-1)
 - K87 (Adenovirus type 2/MAdV-2)
- BALB/c, C#H/HeJ and inbred strains are resistant

Screening

Bi-annually or annually.

Duration

- MAdV-1 shed in urine for up to two years
- In immunocompetent mice, MAdV-2 is shed in faeces for approximately 3 weeks post infection (peak infection between 7-14days)
- Intermittently for at least six months in athymic nudes (shed for 6 weeks post infection)

Durability

- Resistant to ether and acid pH
- Stable for over 2 months at 4°C, 2 weeks at room temp and 1 week at 37°C
- Inactivated at 50°C for 15 minutes

Prevention and Control

- Pathogen exclusion:
 - Regular health monitoring of supplier sub-populations
 - Transport in filter boxes, quarantine at receiving institution with serology testing 2 weeks post arrival
 - Maintenance under strict barrier protocol
- Post infection:
 - Caesarean rederivation, embryo transfer
- Decontaminate the facility with oxidising disinfectants and autoclaving equipment that were used

Reading

- 1991. Infectious Diseases Of Mice And Rats. Washington, D.C.: National Academy Press.
- Barthold, S., Griffey, S. and Percy, D., 2016. Pathology Of Laboratory Rodents And Rabbits, 4Th Edition. John Wiley & Sons.

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