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Murine Cytomegalvirus (MCMV)

Family: Herpesvirus Subfamily: Betaherpesviridae

Prevalence

- Common in wild mice, relatively rare in laboratory mice:
    - A few sporadic positive antibody titres have been found in some Australian colonies
- Not widely screened for overseas
- Wild mice commonly infected with MCMV

Significance

- Significance is low
- Natural infections have not been demonstrated to interfere with research
- Acute experimental infections may affect several immunological systems and susceptibility to infection with other agents

Disease

- Double-stranded enveloped DNA virus
- Natural infections are sub-clinical
- Latent infections can occur in submaxillary glands, T cells, B cells, the prostate, and the testicles
- Other organs known to be infected are the liver, lung, kidney, spleen, and pancreas
- Strains C3H and CBA are relatively more resistant to infection than Balb/c, A strain, C57BU6 and C57BU10
- Immunodeficient mice infected with MCMV can develop necrosis, cytomegaly

Transmission

- MCMV excreted in saliva, tears, semen, urine
- Transmission via water bottle sipper tubes has been demonstrated
- The virus does not spread easily from cage to cage:
    - May result in isolated pockets of infection within colonies which are difficult to detect
- Horizontally transmitted by contact, saliva, and urine
- Vertical transmission occurs under experimental conditions
- Oronasally by direct contact

Isolation and Diagnosis

- Preferred – ELISA testing of serum or DBS sample used for colony surveillance:
    - Confirmation with fluorescent immunoassay (IFA)
- PCR from tissue samples to detect latent infection

Strains

- Number not known, but many isolates have been used in experimental animal models of human cytomegalovirus infection
- Multiple genetically diverse strains

Screening

All colonies for Quarterly screening.

Duration

- Persistent
- Latent infections may be activated by immunosuppressive regimes

Durability

- MCMV is relatively unstable
- Sensitive to ether, lipid solvents and extremes of pH
- Relatively thermolabile - sensitive to freezing and thawing

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
  - Screening of transplantable tumours and other murine derived biological material prior to experimental use
  - Exclusion of wild mice from the facility is essential
- Post infection:
  - Identification and culling of infected stock should be enough to contain the spread of infection coupled with rigorous disinfection protocols

Reading

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