Cerberus Adelaide
Unit 3 49 Holland Street
Thebarton SA 5031
Telephone: +61 8 8234 8780
Facsimile: +61 8 8234 8712
Email: cerberus@cerberus.net.au

Cerberus Melbourne
Unit 2 7-11 Rocco Drive
Scoresby VIC 3179
Telephone: +61 3 9763 8290
Facsimile: +61 3 9763 8290
Email: cerberus@cerberus.net.au

Mouse Hepatitis Virus (MHV)

Prevalence

- Very common; 2'' most common agent detected by serology in Australian mouse colonies, does not infect rats

Diagnosis

- Serology, Lesions, RT-PCR

Disease

- Epizootic - High mortality among neonates to subclinical in adults
- Enzootic - Usually subclinical in all ages
- Wasting syndrome in nu/nu mice (Possibly SCID's as well) over an 8-10 week period

Strains

- Many strains (25 described) which are indistinguishable antigenically. Spectrum of tissue tropisms ranging from respiratory with colonisation of nasal epithelium (minimal lesions apparent) with dissemination possible to liver, lymphoid tissues etc. in susceptible hosts (focal necrosis with syncytia) to enteric where virus is largely restricted to bowel mucosa with ascending colon and caecum major target areas. Enteric disease appears to be age dependant with infant mice developing enteritis and adult mice remaining subclinical. Immunosuppression or co-infection with other pathogens can increase susceptibility to MHV during active infection

Screening

- Commercial Breeding colonies: Monthly; All other colonies: Quarterly

Transmission

- Orofaecal, fomites, aerosol. Extremely contagious. In utero transmission has been demonstrated under extreme experimental conditions but is not considered to play a part in natural infection. Known to be a contaminant of transplantable tumours

Duration

- Acute in immunocompetent mice, 2-3 week period of virus shedding, lesions may only be apparent for 7-10 days. Longer periods of virus shedding in immunocompromised animals

Durability

- Resistant to repeated freeze/thawing. Resistant to heating (56°C for 30 mins). Resistant to acid pH. Sensitive to lipid solvents, drying and disinfectants. Survives 30 days at 4°C and indefinitely at -70°C

Comment

- Coronavirus (RNA). Immunity to MHV is virus strain specific and short lived.
- Coronaviruses readily mutate and recombine, with evolution of new strains and repeated infection being features of enzootic infection

Significance

- High. An extremely large number of effects of MHV on mice and their biologic responses to experimental treatments have been observed

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

- Post infection. Caesarean rederivation, embryo transfer or burn out selecting seronegative progeny as breeding stock post isolation (recommendations vary from 3-12 weeks) of individual breeding pairs in micro-isolators. Burn out is usually only successful if population is immunocompetent and may not be effective with transgenic or knockout lines where immune status has not been fully characterised. Strict husbandry protocols and efficient barrier conditions are essential for success

Reading

- "Infectious diseases of Mice and Rats"- National Academy Press: ISBN 0-309-03794-8.