PARVOVIRUS

CLASSIFICATION

Family: Parvoviridae
Genus: Parvovirus

- Non-enveloped DNA Virus
- Linear, single-stranded
- 15-30nm in diameter
- 5 kbp genome
- Replicates in nucleus

PREVALENCE

Moderate prevalence. Infects both mice (Mouse Parvovirus [MPV] and Minute Virus of Mice [MVM]) and rats (Toolan's H1 [TH1], Kilham's Rat Virus [KRV], Rat Parvovirus [RPV]).

DIAGNOSIS

- ELISA, IFA and PCR
- rNS1 ELISA recommended for Rats (RPV)
- MPV and MVM specific ELISAs recommended for Mice (confirmed by IFA)
- TH1 and KRV detectable by PCR

PCR on faecal samples not recommended as animals can intermittently shed – mesenteric lymph node, spleen or kidney samples are advised.

DISEASE/CLINICAL SIGNS

Natural infections are generally asymptomatic.

Experimentally infected animals are also usually asymptomatic, except for cases observed in BALB/c, CBA, SWR, SJL, and C3H mice infected with MVM. These infections led to morbidity and mortality.

- Growth retardation (experimental)
- Haemorrhage (experimental)
- Cerebellar hypoplasia (experimental)

STRAINS

Parvoviruses are antigenically distinct. Several strains of both MPV and MVM exist. The total number of rodent parvovirus strains is not known. The non-structural proteins, NS1 and NS2, are highly conserved amongst the rodent parvoviruses, and are used in the generic rNS1 ELISA assay. The viral/capsid proteins, VP1, VP2 and VP3, are more specific and are used in the specific MPV and MVM assays for mice.

TRANSMISSION

Parvovirus may be transmitted through a variety of routes including:

- Contaminated food
- Bedding

- Faeces
- Milk
- Nasal secretions
- Fomites
- Urine
- Transplantable tumours

INTERFERENCE WITH RESEARCH

Effects include but are not limited to:

- Intranuclear inclusion bodies
- Modulation and dysfunction of T lymphocytes
- Alteration of cytotoxic lymphocyte activity
- Decreased haematopoiesis in spleen and bone marrow
- Death and resorption of foetuses
- Acceleration of tumour allograft rejection
- Modulation of immune function

DURABILITY

Resistant to:

- Lipid solvents
- Dessication
- Urea, sodium dodecyl sulphate, chloroform, alcohol
- pH 2 - 11
- Heat (2 hours at 80^{o}C, 60 days at 40^{o}C)

Susceptible to:

- Formalin
- Oxidizing agents such as sodium hypochlorite, sodium chloride
- Wet heat at a minimum of 90^{o}C

CONTROL

Maintain regular health monitoring of supplier sub-populations and strict protocols for barrier colonies. Extreme care to be taken by testing transplantable tumour and cell lines before use. Infected mice may be able to transmit the disease for up to 6 weeks, and DNA has been shown to persist in lymphoid tissue of adult mice for at least 9 weeks.

POST INFECTION

Caesarean derivation or embryo transfer can be used to effectively re-populate valuable colonies. Separation of cages and use of filter-top containers can be effective for several types of Parvovirus (KRV, MVM), but not all. Depopulation should be considered where colonies can be easily replaced.

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