# POLYOMA VIRUS

## CLASSIFICATION

Family: Polyomaviridae
Genus: Polyomavirus

- Icosahedral shaped, non-enveloped DNA virus
- 40-50 nm in diameter
- Circular, double-stranded DNA
- 5.292 kbp genome
- Replicates in nucleus

## PREVALENCE

Wild mice are the natural hosts and serve as reservoirs for the disease. Occurrence in contemporary laboratory mouse colonies is rare. Other species such as rats, hamsters, rabbits, guinea pigs and ferrets can be infected experimentally.

## DIAGNOSIS

ELISA, IFA, PCR

## DISEASE/CLINICAL SIGNS

Natural infections in immunocompetent appear to be asymptomatic but long-lasting, and have not been reported to cause tumours. Often the only way to determine past exposure to Polyoma Virus is to perform a serological assay. In immunocompromised mice, tumours are more readily induced.

In experimental infections, mice have been reported to develop a syndrome characterised by wasting and hind limb paralysis. There have also been reports of fatal interstitial pneumonia caused by a pneumotropic strain of Polyoma virus.

## STRAINS

The number of strains is not known.

C57BL/6J mice appear to be more resistant to tumour induction than C3H, CBA and AKR mice, amongst others.

## TRANSMISSION

The main route of transmission is via airborne particles but direct contact is also possible as the virus is shed in saliva, faeces and urine. Thus, contaminated bedding and feed are also sources of infection.

Transplacental transmission can also occur, but only if the dam is experimentally infected during gestation.

## INTERFERENCE WITH RESEARCH

Polyoma virus has huge implications on research involving tumours, other virus stocks and various other biological materials that are passaged through mice. The virus is known to cause multiple tumours in neonatal mice (although infection can be prevented by maternal antibody in some cases) with the most common site being the salivary gland. Other sites include the kidneys, adrenal glands, bone, blood vessels, mammary gland and thyroid.

## DURABILITY

Resistant to:

- Lipid solvents e.g. ether
- Acid pH
- Drying and heat treatment (50$^{o}$C for 1 hour)
- External environment (up to 7 days half-life at 37$^{o}$C)
- Various forms of radiation

Susceptible to:

- 1M $MgCl_2$ for 1 hour
- Sodium hypochlorite (0.6%)
- Chlorine dioxide
- Other high level disinfectants (Peracetic acid, formaldehyde and gluteraldehyde)

## CONTROL

Unless experiments of Polyoma Virus are being carried out, control of the virus does not generally pose a problem. Wild mice should of course be excluded from the facility. Care should be taken by testing transplantable tumour and biological products as possible sources of infection. Once infected, mice will spread the disease very easily. Strict barrier maintenance protocols should be adhered to.

## POST INFECTION

Caesarean derivation is effective in controlling spread of Polyoma Virus.

### BIBLIOGRAPHY

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