Kilham Rat Virus (KRV)

Host species

- natural host: laboratory and wild rats,
- hamsters and other species such as Mastomys natalensis can be infected experimentally (KILHAM 1961, RABSON et al. 1961, National Research Council 1991)

Properties of the virus

- highly temperature resistant (FASSOLITIS et al. 1985)
- highly resistant to environmental conditions like e.g. desiccation (LUM & SCHREINER 1963, TATTERSALL & COTMORE 1986, YANG et al. 1995)
- evidence for virus persistence in rats after natural infection (ROBEY et al. 1968, LIPTON et al. 1973)
- persistent infection after experimental infection of infant and juvenile rats (PATURZO et al. 1987, JACOBY et al. 1991)
- persistent infection in T cell-deficient rats (GAERTNER et al. 1995)
- limited infection in euthymic rats

Strain susceptibility

- none (JACOBY & BALL-GOODRICH 1995)

Organotropism

- viral replication only in mitotically active tissues (TENNANT & HAND 1970) like, e.g. embryo, intestines, tumours
- predilection for the developing liver and cerebellum (KILHAM & MARGOLIS 1966, COLE et al. 1970)

Clinical disease

- infection often asymptomatic (LUM 1970, ROBINSON et al. 1971), but can be severe or lethal, especially in athymic infant rats (GAERTNER et al. 1991)
- cases of spontaneous clinical disease with deaths have been reported (KILHAM & MARGOLIS 1966, COLEMAN et al. 1983)
- fetal and neonatal abnormalities (KILHAM & MARGOLIS 1975)

- cerebellar hypoplasia and ataxia in hamsters after experimental infection (KILHAM & MARGOLIS 1964)
- periodontal disease in hamsters (National Research Council 1991)

Pathology

- haemorrhage and infarction especially in the central nervous system (EL DADAH et al. 1967, COLE et al. 1970, MARGOLIS & KILHAM 1970, BARINGER & NATHANSON 1972)
- intranuclear parvoviral inclusions in areas of necrosis among clinically affected rats (JACOBY et al. 1979, LUSSIER 1991)
- mongoloid-type deformity in new-born hamsters after experimental infection (BAER & KILHAM 1962)
- cerebellar lesions in cats after experimental infection (KILHAM & MARGOLIS 1965)

Morbidity and mortality

- pathogenic in fetal and infant rats (JACOBY & BALL-GOODRICH 1995)
- acute disease in hamsters after experimental infection (KILHAM 1961)
- prenatal infections in rats (JACOBY et al. 1988)

Zoonotic potential

- none

Interference with research

Pathology

- increased leukocyte adhesion in the aortic epithelium (GABALDON et al. 1992)
- hamsters surviving experimental infection develop stunted growth resembling mongolism (KILHAM 1961)

Immunology

- infection of T and B lymphocytes and suppression of various lymphocyte functions (MCKISIC et al. 1995)
- stimulates autoreactive T lymphocytes specific for pancreatic antigens (BROWN et al. 1993)
- virus alters susceptibility to autoimmune diabetes in a rat strain which is normally resistant to this syndrome (GUBERSKI et al. 1991, STUBBS et al. 1994, ELLERMANN et al. 1996)

- alters cytotoxic lymphocyte activity (DARRIGRAND et al. 1984)
- depresses lymphocyte viability and a variety of T cell functions like, e.g. in vitro lymphoproliferative responses (CAMPBELL et al. 1977 a, b)
- stimulates interferon production (KILHAM et al. 1968)

Physiology

- inhibition of lipid formation in rat kidney cells in vitro (SCHUSTER et al. 1991)
- increased abortion rate (KILHAM & MARGOLIS 1969)

Cell biology

- contaminant of cell lines (HALLAUER et al. 1971)
- persistent infection of cell lines and transplantable tumours (WOZNIAK & HETRICK 1969, BASS & HETRICK 1978, National Research Council 1991)
- Teratology
- congenital malformation (MARGOLIS & KILHAM 1975)
- death and resorption of foetuses (KILHAM & MARGOLIS 1966)

Infectiology

- necrosis in the lung may support secondary colonisation with other microorganisms such as Pasteurella pneumotropica (CARTHEW & GANNON 1981)
- KRV together with H-1 and C. piliforme can influence the prevalence rate of Yersinia-induced arthritis in rats (GRIPENBERG-LERCHE & TOIVANEN 1993, 1994)

Oncology

- contamination of transplantable or chemically induced tumours (KIILHAM & OLIVIER 1959, CAMPBELL et al. 1977, NICKLAS et al. 1993)
- contamination of leukaemias or leukaemia virus preparations (KILHAM & MOLONEY 1964, BERGS 1967, SPENCER 1967)
- suppression of leukaemia induction by Moloney virus (BERGS 1969)

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