Polyomavirus

Polyomaviruses are non-enveloped, double-stranded, circular DNA viruses that can cause progressive multifocal leukoencephalopathy (JC virus) and nephropathy (BK virus). BK virus is a member of the Polyomavirus family which rarely causes disease. This is because infected individuals are typically asymptomatic. The virus can disseminate to the kidneys and urinary tract, where it persists in the latent form until some form of immunosuppression develops. Typically, this occurs in the setting of kidney or multi-organ transplantation. Clinical manifestations include renal dysfunction with a progressive rise in serum creatinine on lab evaluation, along with renal tubular cells and inflammatory cells on urinalysis. JC virus is also a type of Polyomavirus that causes progressive multifocal leukoencephalopathy (PML) in the immunocompromised, such as HIV patients. Progressive multifocal leukoencephalopathy is a rare disease characterized by inflammation of the white matter of the brain in multiple locations. Specifically, this virus destroys oligodendrocytes that are responsible for creating the myelin sheath in the CNS. Destruction of these oligodendrocytes leads to demyelination, which impairs the transmission of nerve impulses.



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Characteristics

Non-enveloped
Nun-envelope
While some viruses have viral envelopes covering their protein capsids, polyomaviruses do not.

Double-stranded DNA
DNA Double-helix
Polyomavirus genomes consist of double-stranded DNA, meaning their genetic code consists of deoxyribonucleic acid, as opposed to ribonucleic acid.

Circular
Circular-object
This genome is circular, as opposed to linear.

Disease

BK Virus
BK Drive Through
BK virus is a member of the Polyomavirus family, and is known to cause renal dysfunction in the immunosuppressed.

Kidney Damage
Kidney with Damage
BK virus can disseminate to the kidneys and urinary tract, where it persists in its latent form until some form of immunosuppression develops. Typically, this occurs in the setting of kidney or multi-organ transplantation. Clinical manifestations include renal dysfunction with a progressive rise in serum creatinine on lab evaluation, along with renal tubular cells and inflammatory cells on urinalysis.

JC Virus
JC-on-a-penny
JC virus is another member of the Polyomavirus family which causes progressive multifocal leukoencephalopathy (PML) in the immunocompromised, including HIV patients.

Progressive Multifocal Leukoencephalopathy (PML)
PML-license-plate
Progressive multifocal leukoencephalopathy (PML) is a rare disease characterized by inflammation of the white matter of the brain in multiple locations. Specifically, this virus destroys oligodendrocytes that are responsible for creating the myelin sheath in the CNS.

HIV/AIDS
Band-AIDS
Progressive multifocal leukoencephalopathy (PML) is seen almost exclusively in immunosuppressed patients, such as those with HIV.

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Oligodendrocyte

Old goalie

JC virus destroys oligodendrocytes that are responsible for creating the myelin sheath in the CNS. Destruction of the oligodendrocytes leads to demyelination, which impairs the transmission of nerve impulses.

Demyelination of CNS

Unraveling-myelin on neuron

This virus specifically destroys oligodendrocytes that are responsible for creating the myelin sheath in the CNS. Destruction of the oligodendrocytes leads to demyelination, which impairs the transmission of nerve impulses.

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