

March 2010
QUESTION 12

Outline the classification of viruses giving examples of each class (60% marks). Describe the mechanism of action of acyclovir and oseltamivir (40% marks).

Viruses

range from very small (poliovirus 30nm) to quite large (vaccinia 400nm)
they carry genetic material in the form of DNA or RNA
lack the cellular machinery to produce new genetic material
may be encapsulated (which are less resistant to environment changes) or non encapsulated

Classification is based on

genetic material - DNA (DS DNA -herpes) or RNA (SS RNA -HIV)
number of nucleic strands - single (SS -RNA polio) or double (DS -DNA adenovirus)
mode of replication
size, structure and symmetry (isosahedral (polio), circular (corona virus), complex(vaccinia))

Antivirals

Acyclovir

converted to acyclovir monophosphate then triphosphate
inhibits nucleic acid production, incorporates into DNA resulting in chain termination

Osteltamivir

neuroamindase inhibitor
prevents viral release by infected cells (viral shedding)

Other antivirals

Amantidine

prevents attachment of influenza A

Protease inhibitors

ritonavir - produces immature defective viral proteins

Nucleoside Reverse Transcriptase Inhibitors

zidovudine - prevent nucleic acid synthesis

Non Nucleoside Reverse Transcriptase Inhibitors

nevirapine - prevent nucleic acid synthesis