

VIRAL DISEASES, DNA VIRAL DISEASES

7/27/87, rvsd 15 August 1993, 12 Aug 1996, 8/7/98, 7 Aug 06, 11Aug08, 12Aug09

TFC, P.346, Black's 2nd, p. 266-, Alcamo 323-, Campbell 6th-, Black's 6th-. 264-294, tbl: 270, Bauman 2nd-. 378-403,

DISCOVERY:

Chamberland	1884	developed porcelain filter to remove bacteria
Iwanowski	1892	used filter to try to remove tobacco mosaic disease, "filterable virus"
Beijerinck	1898	showed could be diluted out, destroyed by heat
Forsh & Loeffler	1898	foot and mouth disease caused by filterable agent
Walter Reed	1901	yellow fever also filterable disease (in Cuba)
Twort & d'Herelle	1917	bacteriophage

FEATURES of viruses: (p383)

capsid	protein coat composed of capsomeres, can contain penetration enzymes
genome	may be DNA or RNA, double stranded, single stranded, (+ = mRNA) or (-)
Spikes	Some possess: glycoprotein for attachment, enzymes to assist attachment
Envelope	Some possess, derived upon release by budding from host, replication of enveloped virus, p 284
	Enveloped: inactivated by hi temp, hi or low pH, lipid solvents, <i>some</i> disinfectants (Cl ₂ , H ₂ O ₂ , phenol)
	Naked: lack an envelope, resist many of the above

Host range = which species infected

specificity = which tissue affected, determined by ability to attach, multiply and release

three morphologies:	icosahedral (20 faces)	herpes, polio, cytomegalovirus
(p 382 for sizes and shapes)	helical	rabies, TMV
	complex	small pox, coronavirus, influenza

VARIETY OF VIRUSES, p 383, characterized by comp of genome, enveloped or not, geometry, size

VIRAL REPLICATION

Obligate Intracellular parasites, replicate inside

STAGES:

absorption	bacteriophage (386)	mammalian virus (391, 393)
Penetration	p 386	p 391
Synthesis		
Maturation		
Release		p 393

Bacteriophage parts	p 386:	capsid, genome, tail assembly, tail piece, tail fibers, tail sheath, tailcore
bacteriophage replication:	p 386	
lysogeny:	p 389	in bacteria called a lysogen. In mammalian cells, called provirus

HUMAN DNA VIRUSES p 680

POXVIRUSES	p 680	large, double stranded DNA, enveloped, complex capsids,
Smallpox	p 681	transmission by inhalation, close contact. Then macule, papule, vesicle, pustule, crust, scar. Vaccination by cowpox (cross reaction). Now eradicated.?
HERPES VIRUSES	p 684	Oral Herpes: (mostly herpes simplex 1) latent in trigeminal nerve, recurrence with debilitation (stress, fever, cold, menstruation, UV, etc)
H. Simplex	P 685	Genital Herpes: (mostly HSV-2) latent in sacral dorsal root ganglia.
H. Zoster	p 687	Teratogenic (TORCH: Toxoplasma, Other, Rubella, Cytomegalovirus and Herpes) highly infectious, fever, malaise, skin lesions. Provirus in dorsal root ganglia. Shingles are recurrence in adult (elderly), dermatomes are affected
EPSTEIN-BARR VIRUS	p 690	Burkitt's lymphoma , neoplasm of the jaw
"Mono"		Infectious Mononucleosis: transmitted in saliva: pharynx & parotid, viremia, B cells become infected (apoptosis suppressed). T cells try to kill infected B cells (civil war of immune system): sore throat, fever, enlarged spleen, fatigue. The disease is mild in the young. 70% of adults have antibodies against EBV.
CYTOMEGALOVIRUS	p 691	transmitted by bodily fluids, often intercourse. (50% of US adults infected, latency). Can cause mono-like symptoms. Teratogenic: low IQ, hearing, vision, death...
PAPILLOMA VIRUSES	p 693	papilloma = wart. Infectious. Genital warts, esp strain 18 can lead to cervical CA
ADENOVIRUSES	p 695, 697	DS DNS, naked, spikes, 30 strains can cause "common cold" (and 100+ RNA viruses).
HEPADNAVIRUSES	p 698	hepatitis B: ("serum hepatitis") shed in bodily fluids, thru breaks in tissue, sex (esp anal), IV drugs, liver damage in 10%.