VIRAL DISEASES, DNA VIRAL DISEASES

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

DISCOVERY:
Chamberland 1884 developed porcelain filter to remove bacteria
Iwanowski 1892 tobacco mosaic disease passed thru filter = "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, some disinfectants (Cl₂, H₂O₂, phenol)
Naked: lack an envelope, resist many of the above

specificity = which tissue affected, determined by ability to attach, multiply and release
Host range = which species infected
three morphs: p 382 icosahedral herpes, polio, cytomegalovirus
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 STAGES:
bacteriophage (386) mammalian virus (391, 393)
Obligate Intracellular parasites, replicate inside
absorption p 386 p 391
Penetration
Synthesis
Maturation
Release p 393

Bacteriophage parts p 386: capsid, genome, tail assembly, tail piece, tail fibers, tail sheath, tail core
bacteriophage replication (p 386)
lysozyme (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
H. Simplex p 685 Genital Herpes: (mostly HSV-2) latent in sacral dorsal root ganglia.
H. Zoster p 687 highly infectious, fever, malaise, skin lesions. Provirus in dorsal root ganglia.

EPSTEIN-BARR VIRUS p 690 Burkit'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%.
<table>
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<tr>
<th>Cls</th>
<th>genome</th>
<th>env?, shape</th>
<th>example</th>
<th>diseases</th>
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<tr>
<td>Ia</td>
<td>dsDNA linear</td>
<td>naked polyhedral</td>
<td>Adenovirus (p 695-696)</td>
<td>40+: respiratory 1 cause of “common cold” &amp; of pinkeye  Glitis (20% severe diarrhea in children) sudden onset, short duration</td>
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<tr>
<td>Ic</td>
<td>ds DNA linear</td>
<td>Enveloped largest, most complex,</td>
<td>Poxvirus (p 680-682)</td>
<td>brick shaped, cause inclusion bodies small pox (p 681) cowpox = vaccinia certain warts (molluscum contagiosum)</td>
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<tr>
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<td>enveloped</td>
<td>Hepadnaviridae (p 696-699)</td>
<td>Hepatitis B virus</td>
<td>“Serum” PoE: minor skin break (razor, toothbrush) risk of liver CA (p 698)</td>
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<tr>
<td>ssDNA</td>
<td>linear, naked polyhedral</td>
<td>Parvovirus (p 699)</td>
<td>parvo (“small”) Serious viral disease of dogs, especially puppies.</td>
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