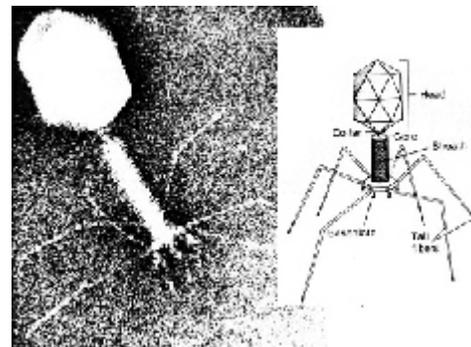


VIRAL DISEASES, DNA VIRAL DISEASES

7/27/87, rvsd 15 August 1993, 12 Aug 1996, 8/7/98, 7 Aug 06, 11Aug08, 12Aug09, 11Aug10
 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	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'Herrelle	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

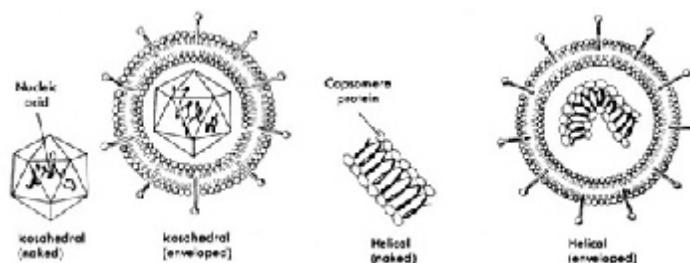
specificity = which tissue affected, determined by ability to attach, multiply and release

Host range = which species infected

three morphs: p 382

icosahedral	herpes, polio, cytomegalovirus
helical	rabies, TMV
complex	sm pox, coronavirus, influenza

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



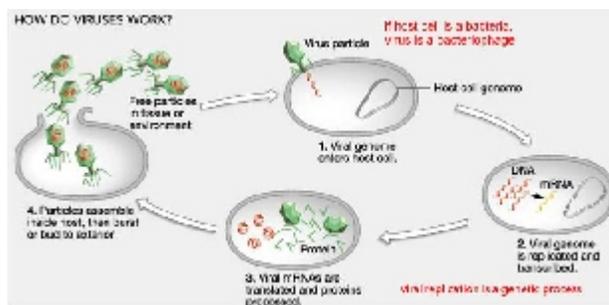
VIRAL REPLICATION STAGES:

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, tailcore

bacteriophage replication (p 386)

lysogeny (p 389): in bacteria called a lysogen. In mammalian cells, called provirus



HUMAN DNA VIRUSES p 80

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. Teratogenic (TORCH: Toxoplasma, Other, Rubella, Cytomegalovirus and Herpes)
H. Zoster	p 687 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%.

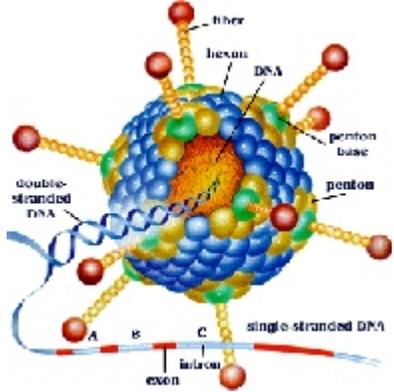
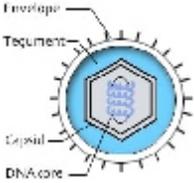
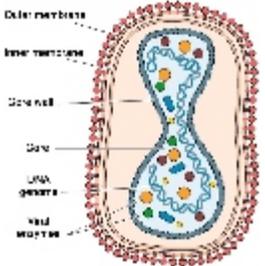


TABLE SUMMARIZING MAJOR CLASSES OF DNA VIRUSES

David B. Fankhauser, PhD

15 August 1993, rvsd 12 August 1994, 15 Feb 02, 15 Feb 06, 26Apr06, 7 Aug 06, 8 Aug07, 20Feb08, 12Aug09,12Aug11

Bauman 2nd: 680-740

Cls	genome	env?, shape	example	diseases
DNA VIRUSES:				
Ia	dsDNA linear	naked polyhedral	Adenovirus (p 695-696)	40+: respiratory 1 cause of "common cold" & of pinkeye Glitis (20% severe diarrhea in children) sudden onset, short duration
				
Ib	dsDNA linear	Enveloped polyhedral,	Herpesvirus (p 682-692)	80+, latency characteristic, usually nerves: (p 682) Herpes simplex 1: oral, fever blisters (p 684) Herpes simplex 2: genital (p 685) Varicella zoster: chicken pox, shingles (p 687, 688) cytomegalovirus leading teratogenic virus (TORCH) Rhadinovirus: Kaposi's Sarcoma (p 692) Epstein-Barr: mononucleosis. Burkitt's lymphoma
				
Ic	ds DNA linear	Enveloped largest, mst complex,	Poxvirus (p 680-682)	brick shaped, cause inclusion bodies small pox (p 681) cowpox = vaccinia certain warts (molluscum contagiosum)
				
II	dsDNA circular	naked polyhedral	Papovavirus (p 692-695)	<i>papilloma</i> : 25+ in humans: str'n 18: cervical CA (p 693) <i>polyoma</i> : 2 in humans, vasculating. Warts (SV-40 : simian virus)
				
		enveloped	Hepadnaviridae (p 696-699)	Hepatitis B virus "Serum" PoE: minor skin break (razor, toothbrush) risk of liver CA (p 698)
	ssDNA	linear, naked polyhedral	Parvovirus (p 699)	parvo ("small") Serious viral disease of dogs, especially puppies.
				