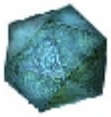
RNA VIRUSES, HUMAN

13 Aug 2008, 14 Aug 09, 11Aug10, 15Aug11
Bauman 2nd, p 704-738, 3rd: (Intro: 375-400), RNA: 706-744.



HUMAN RNA VIRUSES, Table: p 740

NAKED, POSITIVE ssRNA VIRUSES

PICORNAVIRUSES:

Rhinovirus p 707

Common cold: caused in decreasing frequency by : rhinoviruses, paramyxoviruses, enteroviruses, coronaviruses (via aerosol), reoviruses, adenovirus (DNA). Single virus can infect... Can be mixed infection.
Portal of Entry: mucous membrane of nose and eyes, via finger. Person to person most common.

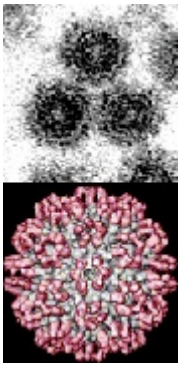
Enteroviruses p 708

Poliomyelitis: 709 fecal-oral transmission "polio water." 90% asymptomatic. >2% paralytic polio.
Vaccines: 710 **Salk:** killed cells injected
Sabin: attenuated live cells orally (possible problem with reversion?)

Foot & mouth Dis: mostly eradicated, but highly contagious in livestock (many thousands animals slaughtered in Britain in 2001)

Gastroenterovirus: 10% of all GI-itis. Norwalk-like or noroviruses.
http://biology.clc.uc.edu/fankhauser/Labs/Microbiology/Norwalk_viruses.htm
Incubation 24 hrs, diarrhea, nausea, vomiting. Resolve in 12-60 hrs.

Hepatitis A and E: (p 711: table of hepatitis infections on) resist chlorine etc disinfectants.
Infected hepatocytes are killed by immune system leading to fever, fatigue, nausea, anorexia, jaundice.
Incubation period one month. Complete recovery 99% time.



ENVELOPED, POSITIVE ssRNA 713

Togaviruses p 710 because enveloped in membrane "cloak" Many are arboviruses (arthropod born viruses)

Encephalitis 714 Variety of diseases, Eastern Equine Encephalitis EEE), Western EE
West Nile Disease. 80% asymptomatic. Spread by mosquitoes, especially Asian Tiger Mosquito:
(http://biology.clc.uc.edu/fankhauser/Animals/mosquitoes/Aedes_albopictus.html)

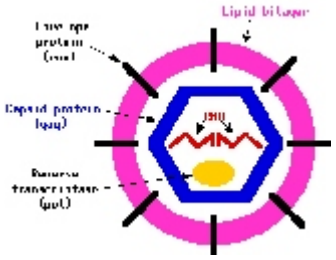
Dengue Fever 715 "Break bone fever" because of pain associated with it. Aedes mosquito spread, tropical, 100 mil people afflicted, usually self limiting in a week.

Yellow Fever 712 intestinal bleeding causes "black vomit." Liver damage = jaundice. 20% mortality.
Walter Reed elucidated cause. Mosquito control eliminates it.

Rubella 716 German measles, "three day measles," crosses the placenta. Teratogen: deafness, blindness, low IQ, microcephaly, fetal death.

Coronavirus 717 2nd most cause common cold, spread by aerosol.
SARS (severe acute respiratory syndrome): highly infectious, 5-8% mortality.

RETROVIRUSES 719 Enveloped +ssRNA, with reverse transcriptase (p 719) Virus contains: two strands of ssRNA, two tRNAs, reverse transcriptase, protease, integrase.

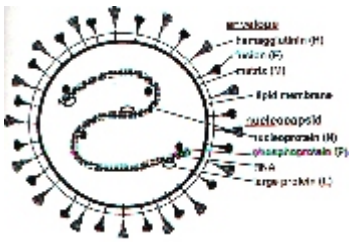


HIV (721) **Human Immunodeficiency Virus**: Primarily parenteral POE, through wound or sore. Attaches to CD4 recepter on T cells, uncoating, dsDNA synthesized, integrated into host chromosome, latency, synthesis and assembly, budding to release viruses. Loss of T cells leads to Acquired Immune Deficiency Syndrome, opportunistic infections and rare cancers leading to death from many causes. **Parenterally transmitted**

Treatment: AZT: inhibits reverse transcriptase, protease inhibitors, blocks protein cleaving

Dangerous activities In *decreasing* degree of risk: sharing needles, anal sex, rough forced sex, consensual sex in presence of lesions, consensual sex without lesions. Oral sex carries little risk. (Some disagree, but data is scant)

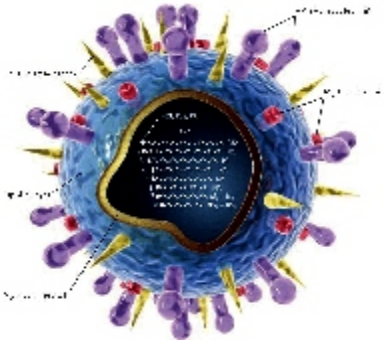
ENVELOPED, NEGATIVE ssRNA Paramyxoviruses, Rhabdoviruses, Filoviruses



Measles 727 Koplik's spots ("salt grains surrounded by red halo) pathognomic, spread by droplet aerosols, maculopapular rash from head to rest of body.

Mumps 729 infection of salivary glands, testes. Recovery usually complete.

Rabies 731 zoonotic disease, usually parenterally (a bite), causes CNS degeneration (Negri bodies), hydrophobia due to painful spasms of the esophagus.



Hemorrhagic Fvr 730 Ebola, Marburg, parenteral transmission, viral glycoprotein prevents cells from adhearing to each other, blood leaks out of vessels. 90% death rate.

Influenza 734-736 H = hemagglutanin, N = neuraminidase. Alterations in H and N make virus undetected by immune system until after infection. **1918:** New antigens: H1N1, killed 20 million world wide. More troops died of flu than combat. 1957, "Asian" flu pandemic: H2N2, 1968 "Hong Kong" flu: H3N2, 1976 swine flu in recruits: H1N1. Bird: H5N1

Reassortment of genes in influenza to produce H1N1 virus: