RNA VIRUSES, HUMAN


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.
- **Enteroviruses** p 708
  - **Poliomyelitis**: 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
  - **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 affected, usually self limiting in a week.
  - Yellow Fever 712 intestinal bleeding causes “black vomit.” Liver damage = jaundice. 20% mortality.
  - 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 receptor 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.
Reassortment of genes in influenza to produce H1N1 virus: