RNA VIRUSES, HUMAN

13 Aug 2008, 12 Aug 09
Bauman 2nd, p 704-738

HUMAN RNA VIRUSES, Table: p 738

NAKED, POSITIVE ssRNA VIRUSES

PICORNAVIRUSES:

- Rhinovirus: p 704
  - Common cold: caused in decreasing frequency by: rhinoviruses, paramyxoviruses, enteroviruses, coronaviruses, reoviruses, adenoviruses. Single virus can infect... Can be mixed infection.
  - Portal of Entry: mucous membrane of nose and eyes, finger introduces. Person to person most common.

Enteroviruses: p 706

- Poliomyelitis: fecal-oral transmission “polio water.” 90% asymptomatic. >2% paralytic polio.
  - Vaccines: Salk: killed cells injected
    - Sabin: attenuated live cells orally (prob with reversion?)
  - Foot & mouth Dis: mostly eradicated, but highly contagious in livestock (many thousands animals slaughtered in Britain in 2001)
  - Gastroenterovirus: 10% of all Giitis. Norwalk-like or noroviruses.
    - http://biology.clc.uc.edu/fankhauser/Labs/Microbiology/Norwalk_viruses.htm
  - Hepatitis A and E: (table of hepatitis infections on p 709) resist chlorine etc disinfectants. Infect hepatocytes, which are then killed by immune system leading to fever, fatigue, nausea, anorexia, jaundice. Incubation period one month. Complete recovery 99% time.

ENVELOPED, POSITIVE ssRNA

- Togaviruses: p 710
  - Encephalitis because enveloped in membrane “cloak” Many are arboviruses (arthropod born viruses)
    - 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: 713
    - “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.
    - Mosquito control eliminates it. Walter Reed elucidated cause.
  - Rubella: 713
    - German measles, “three day measles,” crosses the placenta. Teratogen: deafness, blindness, low IQ, microcephaly, fetal death.
  - Coronavirus: 715
    - 2nd most cause common cold, spread by aerosol.
    - SARS (severe acute respiratory syndrome): highly infectious, 5-8% mortality.

RETROVIRUSES

- Enveloped +ssRNA, with reverse transcriptase (p 715) Virus contains:
  - two strands of ssRNA, two tRNAs, reverse transcriptase, protease, integrase.
- HIV: 719
  - 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 transmit
  - 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: 726
    - Koplik’s spots (“salt grains surrounded by red halo) pathognomic, spread by droplet aerosols, maculopapular rash from head to rest of body.
  - Mumps: 727
    - infection of salivary glands, testes. Recovery usually complete.
  - Rabies: 728
    - 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 adhering to each other, blood leaks out of vessels. 90% death rate.
  - Influenza: 731-734