Animal Viruses

Multiplication of Animal viruses

- Attachment:
- Penetration by endocytosis (receptor mediated or pinocytosis) or fusion (_____).
- Uncoating by viral or host enzymes.
- Biosynthesis: Production of nucleic acid and proteins.
- Maturation:
- Release by budding (_____) or rupture.

Attachment, Penetration, and Uncoating

-
-

Cancer

- Activated oncogenes transform normal cells into cancerous cells.
- Transformed cells have increased growth, loss of contact inhibition, tumor specific transplant and T antigens.
- The genetic material of oncogenic viruses becomes integrated into the host cell's DNA.

Oncogenic Viruses

-
    - Adenoviridae
    - Herpesviridae
    - Poxviridae
    - Papovaviridae
    - Hepadnaviridae
-
    - Retroviridae
        - Viral RNA is transcribed to DNA which can integrate into host DNA
        - HTLV 1
        - HTLV 2
- Latent Viral Infections
    - Virus remains in asymptomatic host cell for long periods
        -
- Persistent Viral Infections
    - Disease process occurs over a long period, generally fatal
        - Subacute sclerosing panencephalitis (_____)

Virus Families

- can be ssRNA, dsRNA, ssDNA, dsDNA
-

Adenoviridae

- *Mastadenovirus*
    - Respiratory infections in humans
    - Tumors in animals

Papovaviridae

- *Papillomavirus* (_____)

Poxviridae
- *Orthopoxvirus* (_____)
- *Molluscipoxvirus*
  - Smallpox, molluscum contagiosum, cowpox

Herpesviridae
- *Simplexvirus* (HHV1 and HHV 2)
- *Varicellavirus* (HHV 3) -
- *Lymphocryptovirus* (HHV 4, EBV) -
- *Cytomegalovirus* (HHV 5)
- *Roseolovirus* (HHV 6)
- HHV 7
- Kaposi's sarcoma (HHV 8)
- Some herpesviruses can remain latent in host cells

Latent Viruses
- Herpesvirus varicella-zoster = chickenpox during initial infection but later in life can reactivate as shingles
- herpes simplex virus (HSV) 1 (_____) and HSV 2 (_____ both recur
- HSV infects and destroys (_____) oral and genital mucosa cells (_____) but lies dormant (_____) in local nerve cells
- recurrence may be stimulated by stress, sunburn, colds, fevers, menstruation,
- recurrences decrease in frequency over time; sometimes ceasing altogether; depends on immune system's ability to control virus
- Virus actively shed from lesions during outbreak but lesions need not be present for virus to be shed!
- an estimated 45+ million Americans are infected w/ genital herpes

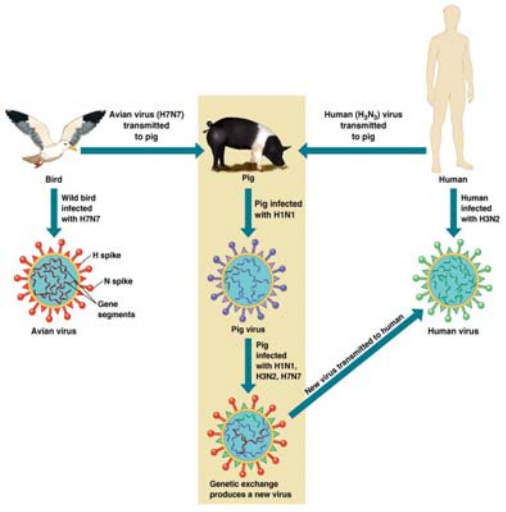
Hepnaviridae
- *Hepadnavirus* (_____)
  - Use reverse transcriptase to produce DNA from mRNA

Calciviridae
- Hepatitis E virus
- *Norovirus* (_____) causes gastroenteritis

Flaviviridae
- Arboviruses can replicate in arthropods; include yellow fever, dengue, SLE, and West Nile viruses
-

Filoviridae
- *Filovirus*
  -
  - Ebola and Marburg viruses

Orthomyxoviridae
- *Influenzavirus* (_____)
- Influenza C virus
  - Envelope spikes can agglutinate RBCs



Retroviridae

- *Lentivirus* (_____)
- Oncogenic viruses
  - Use reverse transcriptase to produce DNA from viral genome
  - Includes all RNA tumor viruses

Control / Treatment

- immune system can destroy viruses by phagocytosis, antibodies, or by destroying virally infected cells
- vaccines using virus "parts", whole inactivated viruses, or live weakened viruses can result in protective antibodies
- antiviral drugs (_____) - they can be used to help prevent infections, reduce duration of infections or outbreaks, prevent formation of new virions

Study Objectives

1. Compare and contrast animal virus replication with bacterial virus replication. How are they similar and different?

2. What is the relationship between cancer, oncogenes and oncogenic viruses? Give three examples of ongenic viruses.

3. Compare and contrast latent viral infections with persistent viral infections. How does each of these resemble bacteriophage lysogeny?

4. List the 8 herpes viruses and describe the diseases they cause, if known.

5. Describe the latent infections of varicella-zoster virus, HSV 1 and HSV 2.

6. List the name, family, disease (specific or general) of the underlined viruses listed in the notes.

7. Discuss how viruses can be controlled and treated.