

ONCOGENIC VIRUSES:

Viruses that produce tumours in their natural host/experimental animals or which induce malignant transformation of cells on culture.

TYPES:

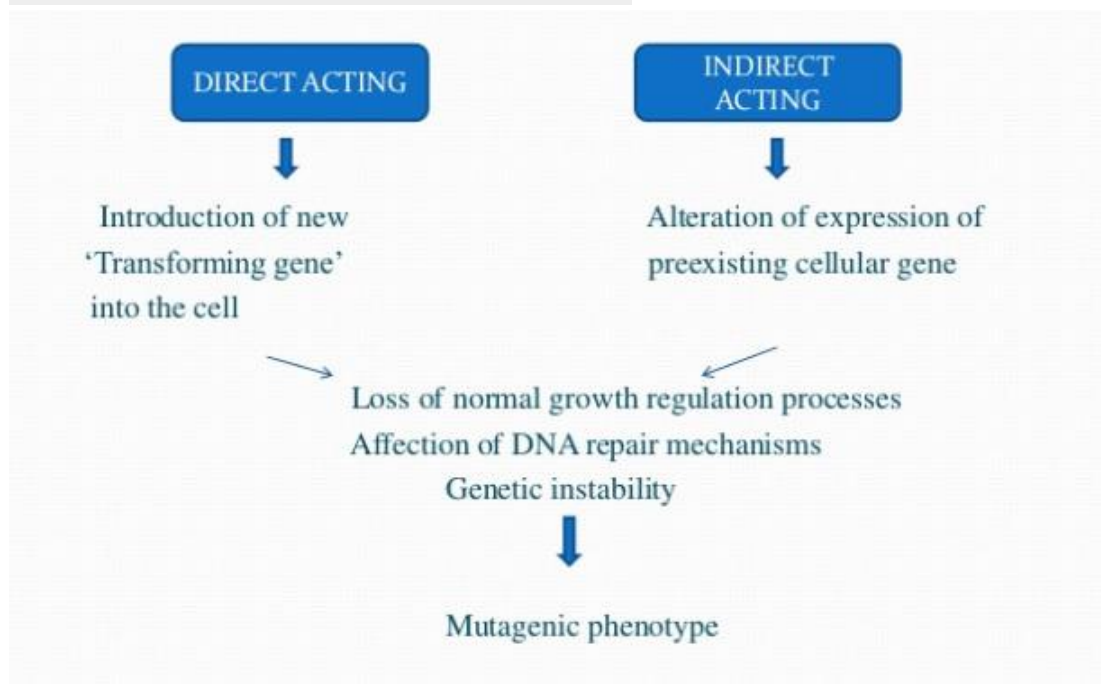
- Oncogenic RNA Viruses

Retroviruses are divided into oncoviruses, lentiviruses, and spumaviruses.

- Oncogenic DNA Viruses

Oncogenic human DNA viruses include hepatitis B viruses, herpesviruses, and papillomaviruses ,CMV ,EPV.

MECHANISM OF ONCOGENECITY



- **Oncogenic DNA Viruses**

Human papillomaviruses (HPV)

- ♣ Small
- ♣ Non-enveloped
- ♣ Virion –Icosahedral
- ♣ Genome – double stranded ,circular DNA (8000bp)
- ♣ 16 genera (5 – human infections)

Epidemiology: - HPV induced cervical cancer is 2nd most common cancer worldwide - 16% of all female cancers are linked to HPV - Papilloma virus is found in 90% of women with cervical cancers

- ♣ Genital HPV is a very common sexually transmitted infection which usually causes no symptoms and goes away by itself, but can sometimes cause serious illness.

Epstein Barr Virus (EBV)

- ♣ Infectious mononucleosis

- ♣ Burkitt's lymphoma

♣ Epstein-Barr virus (EBV), also known as human herpesvirus 4, is a member of the herpes virus family. It is one of the most common human viruses. EBV is found all over the world.

♣ Epidemiology - Ubiquitous - Burkitt's lymphoma – children in Central Africa - Nasopharyngeal carcinoma – Cantonese China , Alaskan eskimos.

Cytomegalovirus (CMV)

♣ is a common virus that infects people of all ages. CMV is in a person's body, it stays there for life and can reactivate. A person can also be reinfected with a different strain of the virus.

♣ Most people infected with CMV show no signs or symptoms. That's because a healthy person's immune system usually keeps the virus from causing illness. However, CMV infection can cause serious health problems for people with

weakened immune systems, as well as babies infected with the virus before they are born (Congenital CMV).

- **Oncogenic RNA Viruses**

- Retroviridae – Human T cell leukemia viruses • (HTLV-1 and HTLV-2)
 - Causes » Adult T – cell leukemia
 - » Lymphoma
 - Feline leukemia virus (FeLV)
- Contagious
- Causes leukemia and lymphoma in cats – Related to presence of reverse transcriptase – Some contain promoters that turn on other oncogenes

RNA Tumor Viruses Groups of Retroviruses

- Oncovirinae important Tumor viruses and similar
- Lentiviruses important Long latent period Progressive chronic disease
- Visna HIV
- Spumavirinae

Adenoviridae:

General characters:

1. Non enveloped, dsDNA viruses.
2. Icosahedral symmetry.
3. Replicate in nuclei, forming intranuclear inclusion bodies.

Genera of Adenoviridae:-

1-hydropericardium hepatitis syndrome (HHS):- is an acute disease of young chickens associated with anemia, hemorrhagic disorders, and hydropericardium.

Transmission:-

- 1-Vertical transmission has been described in progeny from breeder flocks infected with AAV serotypes 4 and 8.
- 2-young chicks in contact with infected chicks .

Clinical Findings:-

specific clinical signs, abrupt onset of mortality, lethargy, huddling with ruffled feathers, and yellow, mucoid droppings may be seen.

diagnosis

- 1-clinical signs.
- 2-Viral isolation.
- 3-restriction enzyme analysis, and PCR.

Treatment and Prevention

- 1-there is no treatment. Antibiotics may help prevent secondary bacterial infections. Sulfonamides are contraindicated if evidence of hematologic disease or immunosuppression is seen.
- 2-live and inactivated vaccines are used to control the syndrome.

2-Egg drop syndrome:-

is an aviadenovirus-induced disease characterized by the production of pale, soft-shelled, and shell-less eggs by apparently healthy laying hens.

Clinical Findings

pale-shelled eggs, quickly followed by production of soft-shelled and shell-less eggs. The thin-shelled and shell-less eggs are fragile, and the birds tend to eat them;

Diagnosis:

- 1-Clinical signs.
- 2-viral isolation.
- 3-A hemagglutination-inhibition test using fowl RBCs .
- 4-ELISA,
- 5-neutralization test can be used for confirmation.

Control:-

There is no treatment. Inactivated vaccines with oil adjuvant are available.

Parvoviridae:-**General characters:**

1. small, non enveloped DNA viruses.
2. Icosahedral symmetry, single stranded DNA.
3. Replicate in the nucleus forming intra nuclear inclusion bodies.
4. Require rapidly- dividing cells for replication.
5. Resistant to heat 56C for more than 60 minutes also resistant to lipid solvents, pH (3-9)

Parvovirus: cause of enteric & systemic disease in dogs & cats (Feline pan leukopenia or feline infectious enteritis).

Transmission:-

Cats are infected oro nasally by exposure to infected animals, their feces, secretions, or contaminated fomites(eg, shoes, clothing).

Clinical Findings

Acute cases show fever, depression, and anorexia. Vomiting usually develops 1–2 days after the onset of fever. Diarrhea may begin a little later but is not always present. Extreme dehydration develops rapidly.

Diagnosis

1-clinical signs

2-Total WBC counts $<2,000$ cells/ μL are associated with a poorer prognosis.

3-immunochromatographic test kit intended for detection of fecal CPV antigen.

Treatment and Prevention:-

1- Parenteral, broad-spectrum antibiotic therapy is indicated.

2-Recombinant feline interferon omega

3-inactivated and modified live virus vaccines

Poxviruses

1-brick or oval-shaped viruses

2- large double-stranded DNA genomes.

- Poxviruses exist throughout the world and cause disease in humans and many other types of animals. Poxvirus infections typically result in the formation of lesions, skin nodules, or disseminated rash.
- some poxviruses, such as smallpox (variola virus), no longer exist in nature, other poxviruses can still cause disease. These include monkeypox virus, orf virus, molluscum contagiosum, and others.

Transmission:-

Infection in humans usually occurs due to contact with contaminated animals, people, or materials.