ADENOVIRIDAE

- Adenoviruses are ubiquitous. They are a group of important animal viruses.

- Human adenoviruses cause URTI to pneumonitis.
- The virus is also responsible for – epidemic kerato-conjunctivitis & pharyngoconjunjunctival fever.

Properties of Adenoviridae

- Genus Mastadenovirus comprises 47 Human serotypes.
- Icosahedral virion
- Linear ds DNA 36-38 Kbp
- Transcription, DNA replication and virion assembly occur in nucleus.
- The currently 47 human adenovirus are assigned to six subgenera (A-F) on basis of various biochemical and serological criteria (oncogenicity, agglutination e.t.c).

Viral Replication

- Adenoviruses bind to the host cell receptor via? Receptor and enter the cell by endocytosis.

- mRNA transcription, viral DNA replication and viral assembly in the nucleus.

Pathogenesis & Immunity

- multiply initially in the pharynx, conjunctiva or small intestines and do not spread beyond the draining lymph nodes.
- As the Ds remains relatively local, the incubation is short (5-2/7).
- Most of the enteric infections and some of the respiratory infections are subclinical.
- Generalized infection occur in immunocomprised persons, with particularly type 7.
- In contrast to most respiratory viral infections, adnovirus infections immunity

LAB DIAGNOSIS

- Depending on the clinical presentation, appropriate specimens for diagnosis include:- feces; pharyngeal swab, nasopharyngeal aspirate conjunctival swab ...
- (EIA) is emerging as the diagnostic method

- Virus culture and isolation is the approach of reference labs.

Clinical Syndromes Associated with Adenoviruses

Respiratory infections:-

- Pharyngitis – type 1-7
- Acute Respiratory disease (ARD) – types 4 & 7
- Pneumonia – Common in infants – types 7 & 3

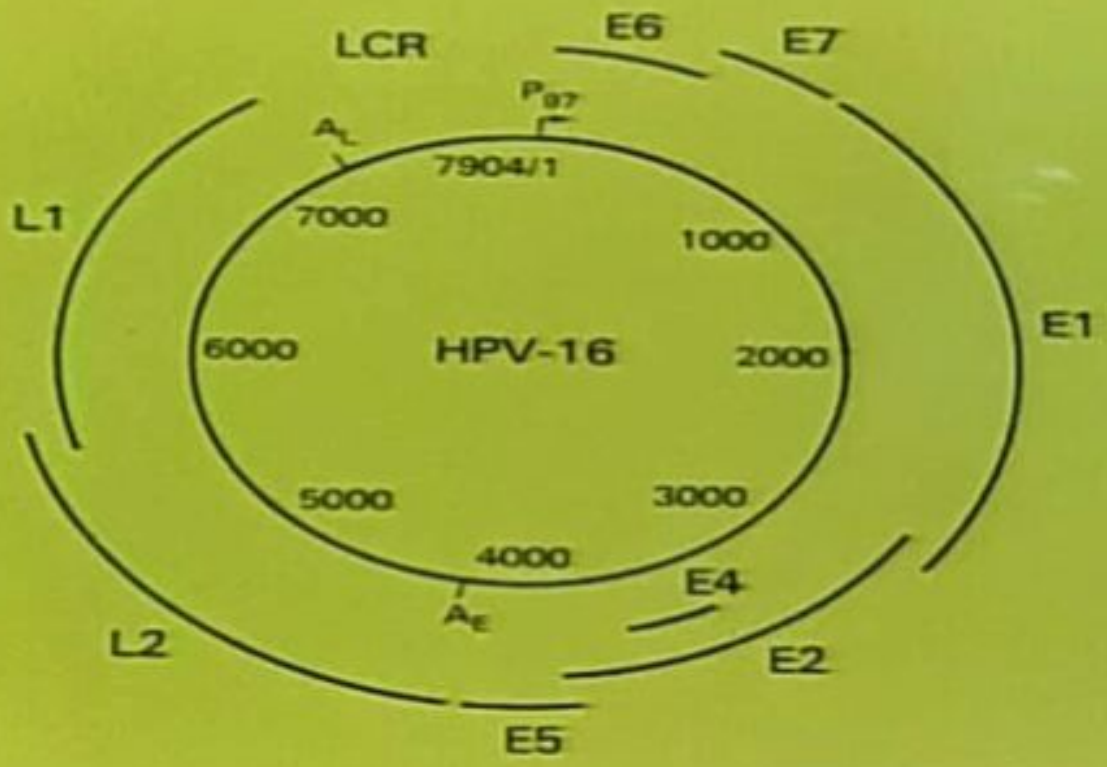
Ocular infections:-

- Pharyngoconjunctival fever tends to occur in out-breaks.

PAPOVAVIRIDAE

- The main interest in Papovaviruses lies in the fact that they cause cancer in humans.

HPV16 genome



Genomic map of HPV-16. The genome is a double-stranded circular DNA molecule of 7904 base pairs. Transcription occurs in a clockwise manner; the only transcriptional promoter presently mapped for HPV-16 is designated P97. The open reading frames deduced from the DNA sequence are designated E1 to E7, L1, and L2 and are indicated outside of the circular genome. AE and AL represent the early and late polyadenylation sites. The viral long control region (LCR) contains transcriptional and replication regulatory elements. (From Fields Virology, 4th ed, Knipe & Howley, eds, [illegible] & Wilkins, 2001, Fig. 66-2.)

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Pro.Omu Anzala

PAPILLOMAVIRUSES

- There are over 70 different types of Human Papillomaviruses (HPV).
- HPVs are greatly restricted in their tissue tropism, multiplying only in epithelial cells of the skin or certain mucous membranes with different HPV types displaying preferences for different sites in the body.
- Fall into two groups:-

1) Cutaneous types of HPV (infecting skin)
2) Mucosal types of HPV (infecting the genital tract and sometimes the respiratory tract, oral cavity or conjunctiva).

Pathogenesis

- HPV gains entry into basal cells via epithelial disruption (micro lesions). Once the virus has gained entry into basal cells, three possible sequence of events have been observed:-

1) The HPV genome remains as a non-integrated dsDNA (Episomal) within the host cell – latency. Patients may display no evidence of infection and yet may still harbor the virus.
2) HPV undergoes productive infection and induces the proliferation of squamous epithelial into benign tumours (warts, papillomas).
3) HPV genome becomes integrated into the host genome, which interrupts the control E7/E6 proteins.

- HPV lesions reveal great variations as well with regard to their risks for malignant progression HPV types 16, 18 are high risk and 6,11 are low risk. Two genes are responsible for immortalizing activity.

- The E6/E7 gene produce proteins which bind to cellular proteins P53. According to some studies, this results in continous proliferation (Cervical Ca).

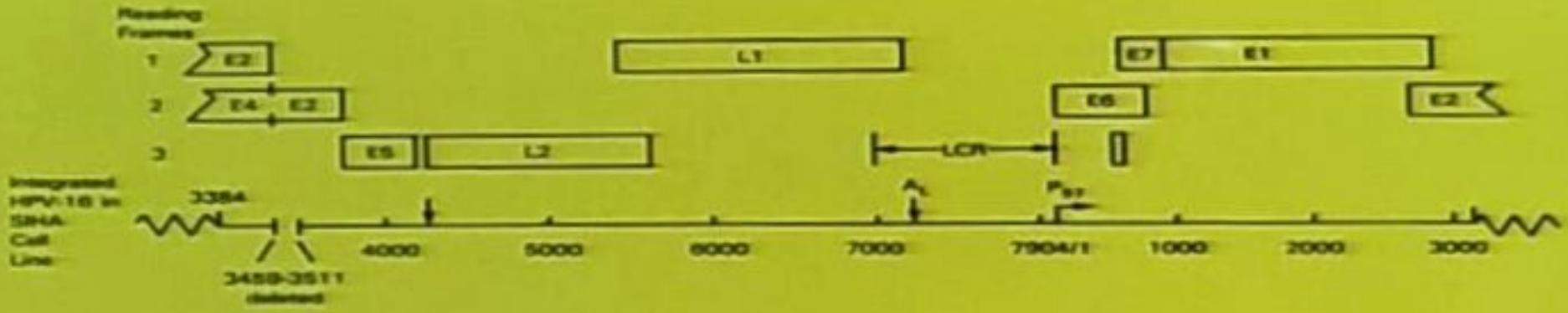
- Some possible risk factors have been identified in association with high HPV infection. These includes:-
  - Having sex
  - Current infection with HHVs
  - Smoking
  - Oral contraceptive
  - Pregnancy

Lab Diagnosis

- Clinically, the diagnosis of skin warts and condyloma accuminata on the external genitalia pose no great problems.

- Cervical wart are visualized by colposcopy . flat and indistinguishable from cervical intra-epithelial neoplasia.
- Therefore need of Papanicolaou Smear (PAP) for routine screening of women for pre/malignant changes of the cervix.
- The only generally applicable diagnostic approach is to probe viral DNA or for particular viral genes.

HPV DNA integration into a human chromosome



Structure of the single copy of HPV-16 DNA integrated into the SiHa cell line derived from a cervical carcinoma. The jagged line represents human chromosomal sequences; the nucleotide numbers pertain to the integrated HPV-16 genome. The open boxes indicate the early and late open reading frames (ORFs). Integration has occurred in the E2 ORF, and a portion of the E2 ORF has been deleted. (From Fields Virology, 4th ed, Knipe & Howley, eds, Lippincott Williams & Wilkins, 2001Fig. 66-9.)

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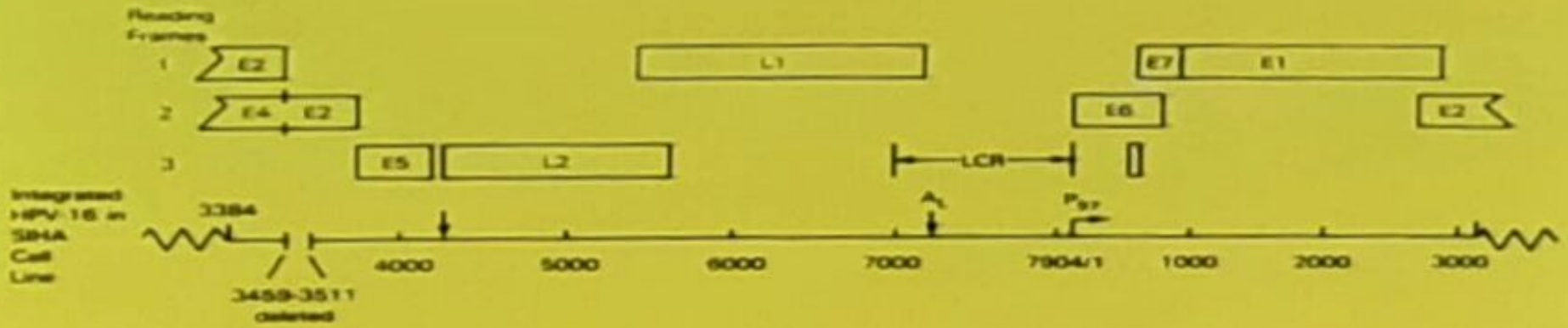

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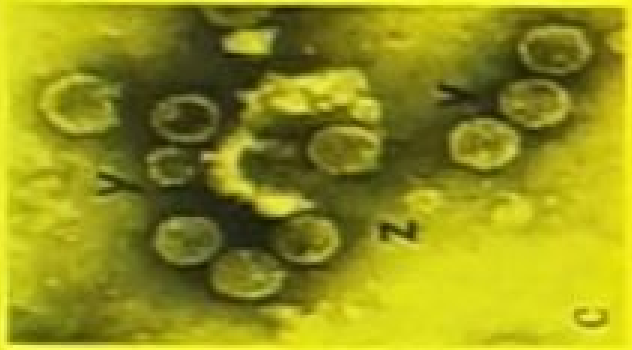
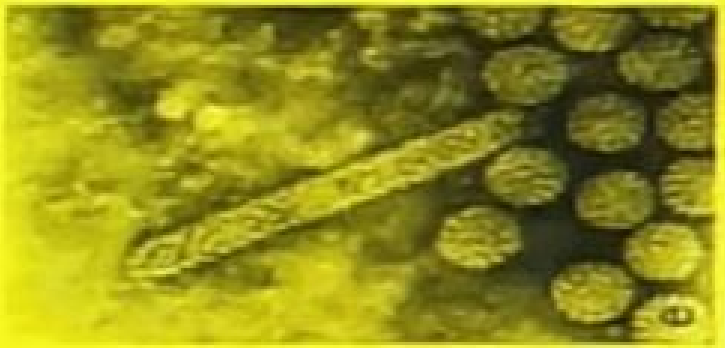
Treatment

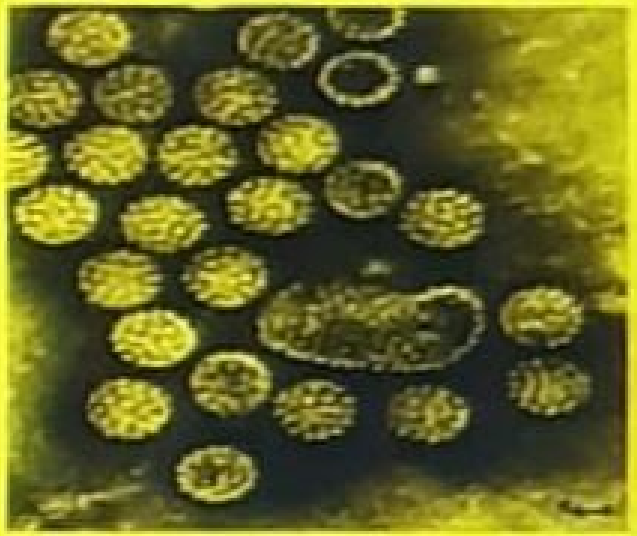
- Skin warts can be removed by:-
  1) Cryotherapy
  2) Caustic chemicals
- Laryngeal papillomas by laser
- External genitalia warts by cryotherapy podophyllin
- Cervical warts by laser

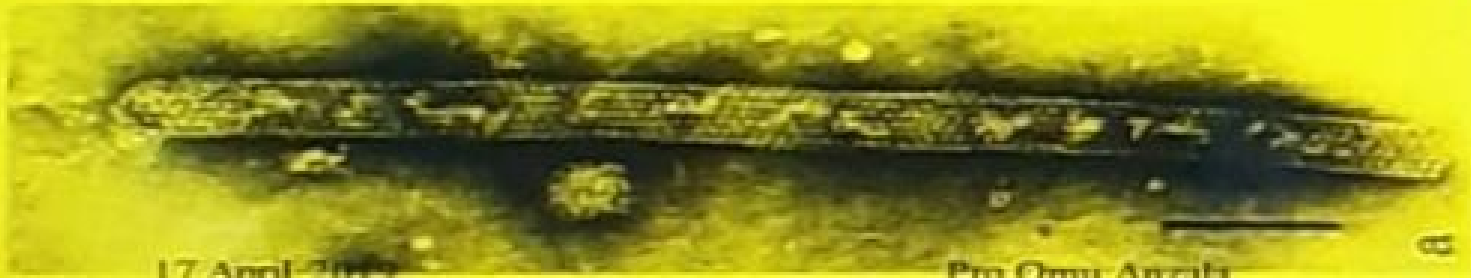
Prevention/Treatment

- Recombinant virus-like particle vaccines
  - Gardasil
    - FDA approved; HPV 16, 18, 6, 11
  - Cervarix
    - FDA approval pending; HPV 16, 18
- Pap smear
- Surgery









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