NEOPLASTIC CELLS

Increased in growth factor

Increased in growth factor receptors

Increased in signal transduction

Increase in activation of transcription
Carcinogenesis
Hypotheses of the Origin of Neoplasia

• 4 – Failure of Immune Surveillance
  – Concepts
    • Neoplastic changes frequently occur in cells
    • Altered DNA result in production of neoantigens & tumor-associated antigens
    • Immune response (cytotoxic) to neoantigens as foreign antigens
    • Neoplastic cells escaping recognition and destruction become clinical cancers
Carcinogenesis
Agents Causing Neoplasms

- Carcinogen: substances known to cause cancer or produces an increase in incidence of cancer in animals or humans
  - Cause of most cancers is unknown
  - Most cancers are probably multifactorial in origin
  - Known carcinogenic agents constitute a small percentage of cases
  - Unidentified ‘environmental’ agents probably play a role in 95% of cancers
conclusion

• Pathogenesis of cancer is complex
• It is a genetic disease - either acquired genetic abnormality or inherited genetic abnormality
• It arises when several mutations accumulate within genome
Acquired environmental factors
chemicals, radiation, viruses
Changes in genome of somatic cells
Activation of growth promoting oncogenes
Inactivation of cancer suppressor genes
Expression all altered gene products and loss of regular gene products
MALIGNANT NEOPLASM
Genetic factors
Carcinogenesis
Agents Causing Neoplasm

– Mode of carcinogenesis
  • Inducing changes in DNA – eg. Base alkylation, deletion, breakage, cross-linkage
  • Epigenetic mechanisms
  • Synergistic action with viruses
  • Promoter for other carcinogens

– Difficulties in identifying carcinogen
  • Numerous industrial, agricultural, household chemicals present in low levels
  • Exposed to large number of chemicals in a lifetime
  • Long lag phase