CANCER & IMMUNE SYSTEM

Immune Response to cancer:

→ Acc. to Immunosurveillance hypothesis,
the immune cells do surveillance for tumour antigens.

→ Acc. to Immunoediting hypothesis
initially, the immune cells will try to neutralize the tumours, however, later these immune cells will help in tumour Progression.

Immune response to tumour takes place in 3 Phases –

- Elimination Phase: When new tumour cells appear, NK cells, $CD4^+$ / $CD8^+$ cells will try to neutralize the tumour cells.
- Equilibrium Phase: Generation of mutant tumour antigens that allows few cancer cells to escape the immune cells. (due to evolutionary Pressure ^ caused by immune cells)
- Escape Phase: over time, a variety of diff. tumour variants develop and will be completely able to escape the immune cells.

Mechanisms by which tumours avoid immune recognition:

1) Low immunogenecity
2) Tumor treated as self antigen
3) Antigenic modulation – eg. of Immunoediting hypothesis.
4) Tumour-induced immune suppression
5) Tumour-induced privileged site – Release of factors such as collagen that forms a physical barrier around tumours.

DATE: / /
PAGE:

Cancer immunotherapy -

* Monoclonal Abs can be targeted to tumor cells
* Cytokines can be used to augment the immune response to tumors
* Tumour-specific Tcells extracted from cancer Patients are reactivated ~~in vivo~~ (using cytokines & diff. co-stimulatory molecules that helps T cells come out of their state of anergy). in vivo. They are re-introduced into the Patients.
* Therapeutic vaccines against tumours [under development]

Tumor Antigens :-

They are Proteins, glycoproteins, glycolipids, or carbohydrates expressed on surface of tumor cells.

- Tumor-specific antigens :
  - Restricted to tumor cells
  - Chemical or Physical carcinogens : some are virally-induced tumors.

- Tumor-associated antigens:
  - Present on both tumor and normal cells
  - Normal cellular proteins with unique expression Patterns: extremely low levels in normal conditions
    eg: Epidermal growth factor (EGF) receptor
  - Expressed only during specific developmental stages, such as in fetus
    eg: Oncofetal tumor antigens are alpha-fetoProtein (AFP) and Carcinoembryonic antigen (CEA)