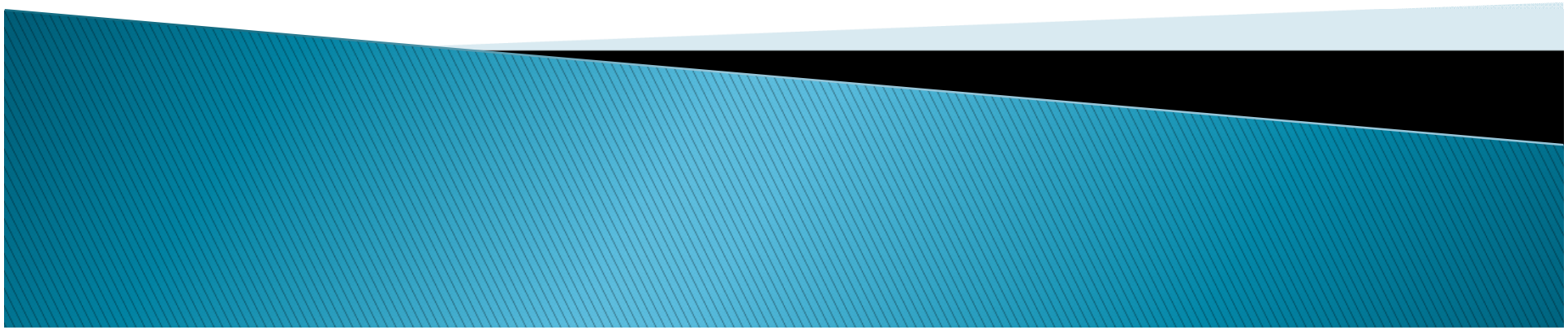
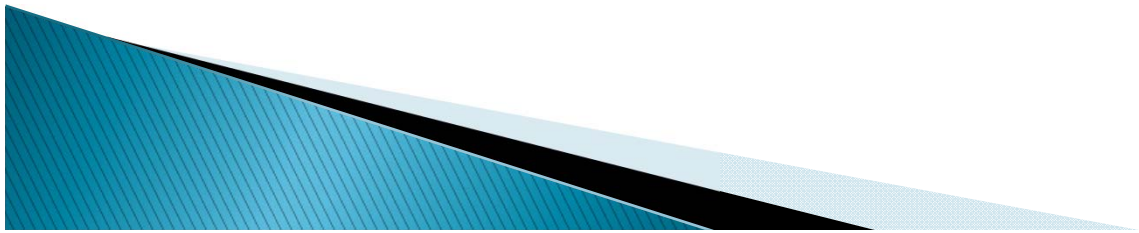
IMMUNE RESPONSE / IMMUNE DEFICIENCY STATE & ORGAN TRANSPLANT

IMMUNE RESPONSE



IMMUNE RESPONSE

- Specific reactivity induced in host by an antigenic stimulus – immune response
- Antigen–living or nonliving
- Response may be beneficial, indifferent or injurious
- Two type : Humoral (antibody mediated)
  Cellular (cell mediated)
- Develop together, one or other predominate or exclusive
- Act in conjunction or opposition.



IMMUNE RESPONSE

- Humoral (antibody mediated)

  Primary defence against extracellular bacterial pathogens

  Defence against viruses that infect through respiratory/intestinal tracts

  Pathogenesis of immediate type 1,2,3 hypersensitivity.

- Cell mediated immunity :

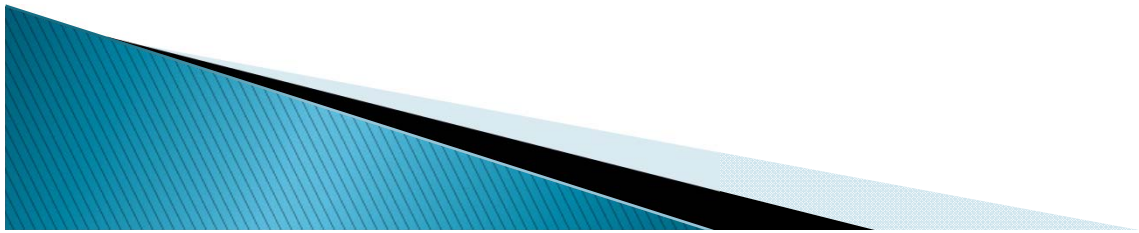
  Fungi, viruses, intracellular bacterial pathogens

  Rejection of homograft , graft verse host reaction

  Immunity against cancer ,

  Delayed (type 4) hypersensitivity

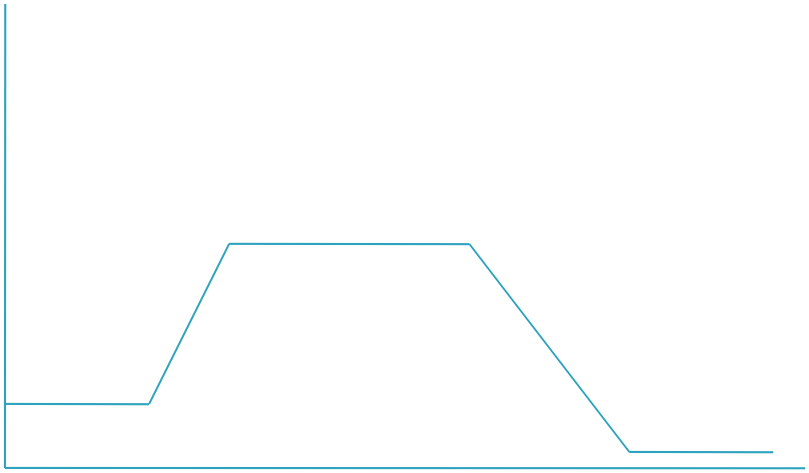
  Autoimmune diseases



Humoral immune response

- Entry of antigen (afferent limb),
  Processing of antigen (central function)
  Secretion of antibody (efferent limb)

- Antibody production follows path
  Lag phase
  Log phase
  A plateaue phase
  Phase of decline



Humoral immune response

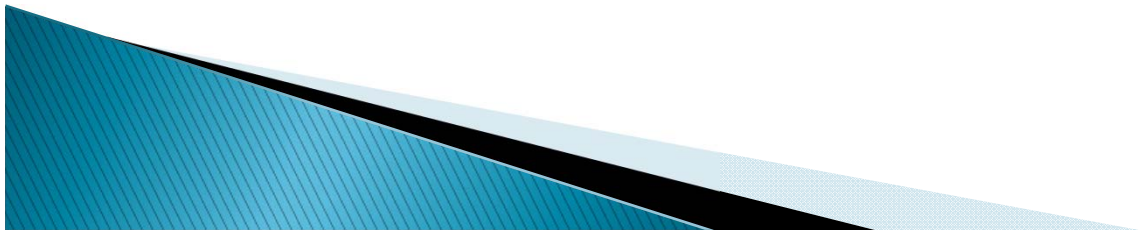
- Primary response : Initial response to antigen
  Differ from subsequent stimuli (qualitative & quantatively)
  Slow , sluggish, short lived,
  Long lag phase, low antibody titre (IgM)

- Secondary response : Powerful, prolong
  Short lag phase
  Higher antibody titre (IgG)

- Antigen : Fate depends on physical & chemical nature ,
  Dose , route of entry
  Primary or secondary response

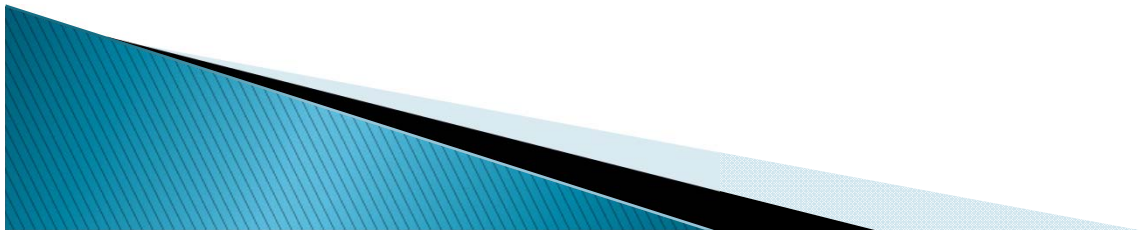
- Antigen in circulation :
  Localized spleen liver bone marrow kidneys & lungs
  Breakdown by RE cells & excreted in urine

- Antigen in circulation
  Nonimmune phase - antigen engulf by phagocytic cells
  Immune phase - antigen-antibody complex



- Antigen in SC : Localized in lymph nodes

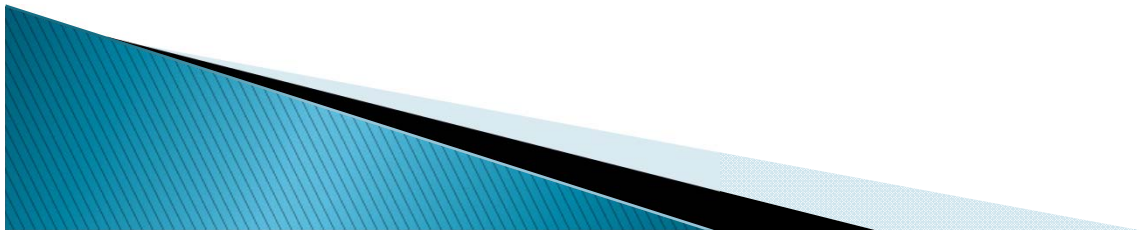
- Antigen (soluble) three phase,
  Phase of equilibration–diffusion of antigen to extravascular space
  Metabolic phase -- Antigen falls due to catabolism,
  Immune phase -- Antigen- antibody complex formation
  Tissue damage & serum sickness

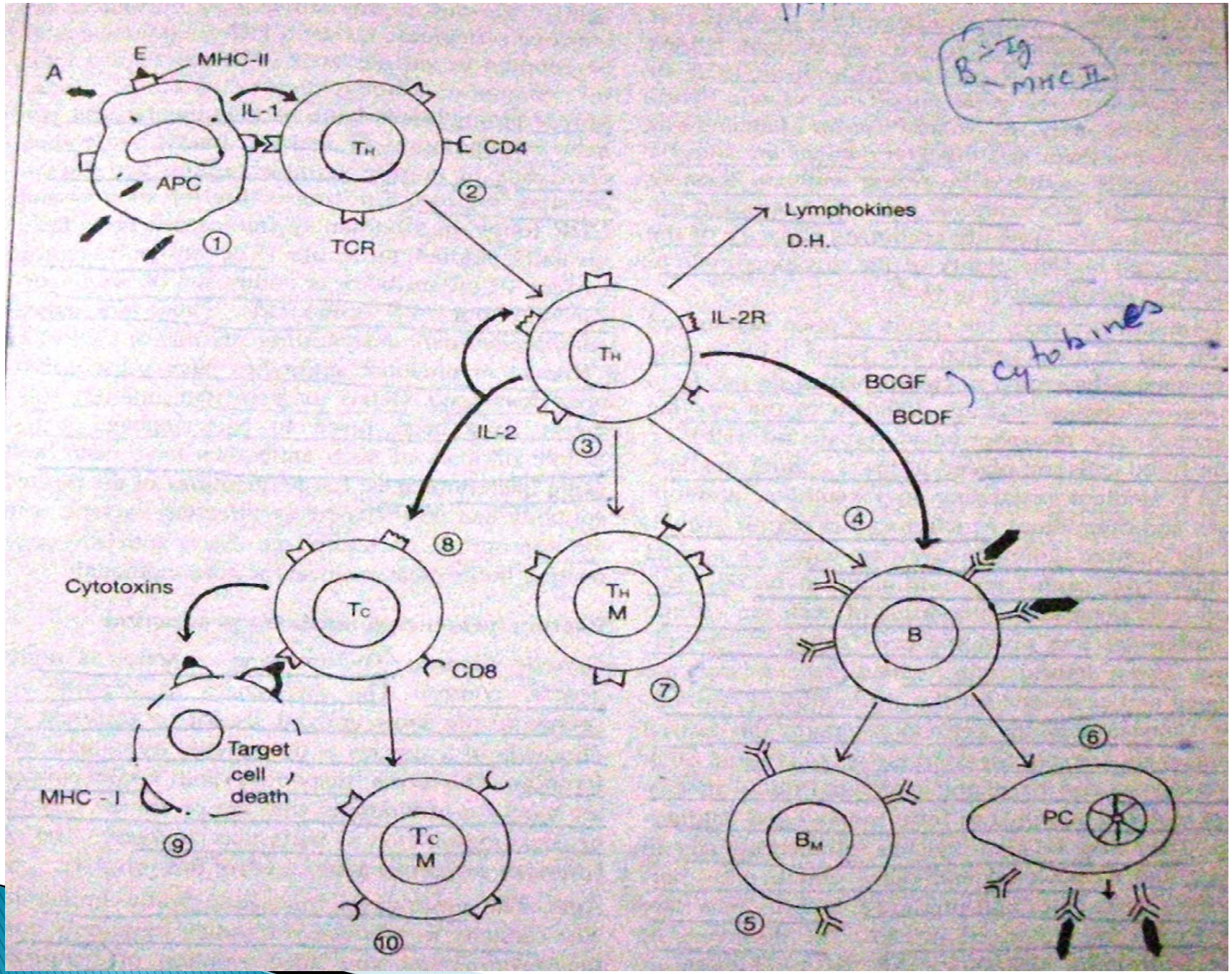


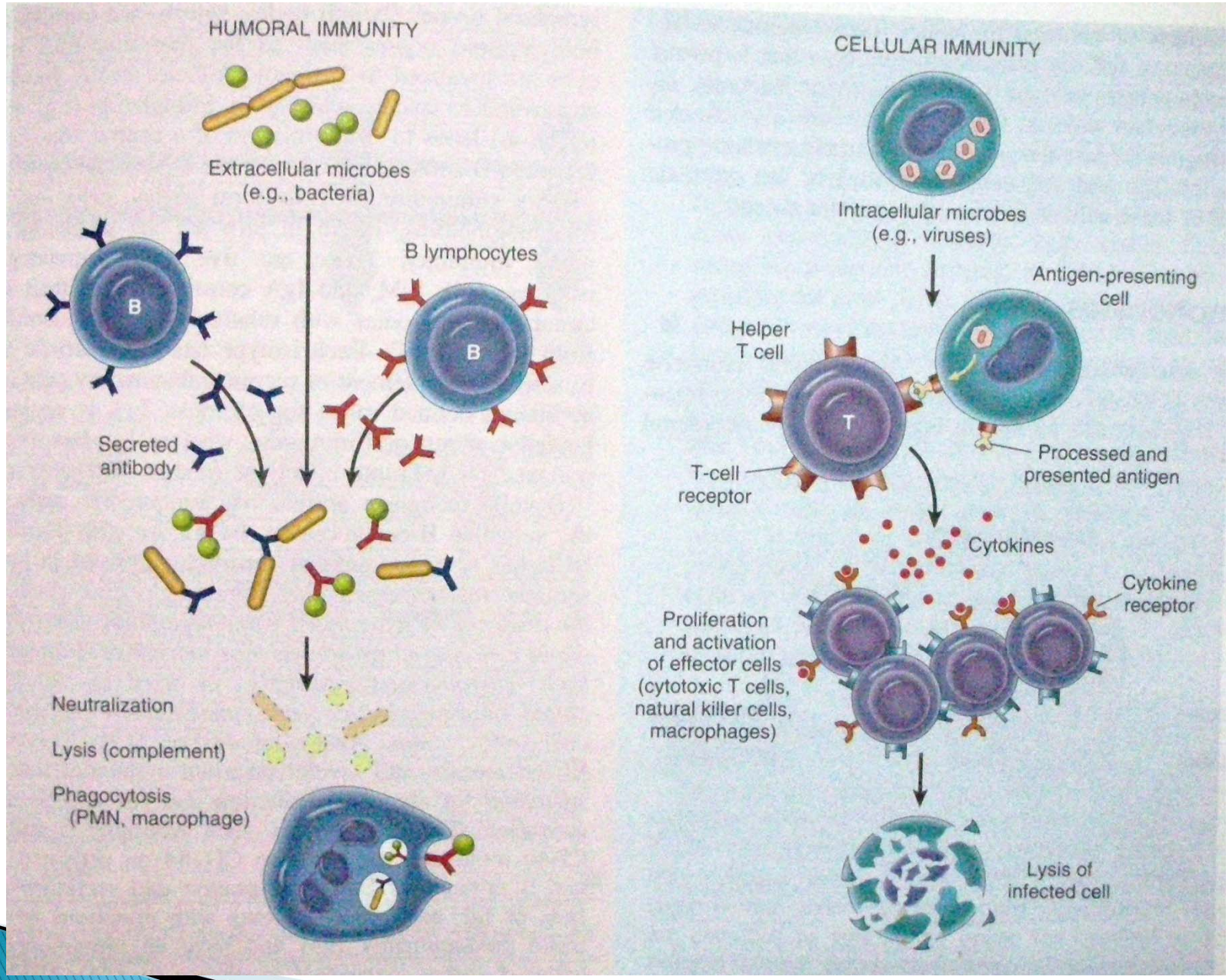
Component of immunity

- Three types of cell
  - Antigen processing cell (APC) -- macrophages & dendritic cells
  - T cells & B cells

- Cytokines :
  - Biologically active substance released by activated T lymphocytes
  - Interleukin 1-13
  - Colony stimulating factors
  - Tumor necrosis factor
  - Interferons




A
E
MHC-II
IL-1
APC
①
TH
CD4
②
TCR
Lymphokines
D.H.
IL-2R
TH
BCGF
BCDF
IL-2
③
④
8
Cytotoxins
TC
CD8
THM
⑦
B
Target
cell
death
MHC - I
⑨
TCM
⑩
BM
⑤
⑥
PC


HUMORAL IMMUNITY
Extracellular microbes
(e.g., bacteria)
B lymphocytes
B
B
Secreted
antibody
Neutralization
Lysis (complement)
Phagocytosis
(PMN, macrophage)
CELLULAR IMMUNITY
Intracellular microbes
(e.g., viruses)
Antigen-presenting
cell
Helper
T cell
T
T-cell
receptor
Processed and
presented antigen
Cytokines
Cytokine
receptor
Proliferation
and activation
of effector cells
(cytotoxic T cells,
natural killer cells,
macrophages)
Lysis of
infected cell

- Factors influencing antibody production
  - Genetic factors
  - Age
  - Nutritional status
  - Immunosuppressive agents
    - Radiomimetic drugs(cyclophosphamide)
    - Corticosteroids
    - Antimetabolites – folic acid antagonist(methotrexate)
      5FU