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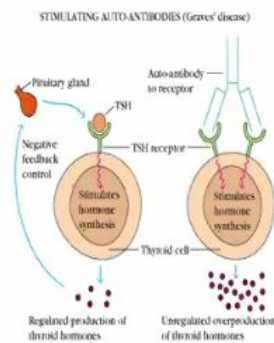
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Tolerance and Autoimmunity - PowerPoint

IMATIONS SLIDE SHOW REVIEW VIEW

Paragraph Drawing Editing

Grave's Disease



- Production of thyroid hormones is regulated by thyroid-stimulating hormones (TSH)
- The binding of TSH to a receptor on thyroid cells activates adenylate cyclase and stimulates the synthesis of two thyroid hormones: thyroxine and triiodothyronine
- A person with Grave's Disease makes auto-antibodies to the receptor for TSH. The binding of these auto-antibodies to the receptor mimics the normal action of TSH, without the regulation, leading to overstimulation of the thyroid
- The auto-antibodies are called long-acting thyroid stimulating hormones

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Tolerance and Autoimmunity - PowerPoint

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Mechanisms of Tolerance

- Can be divided into:
 - 1) **Central Tolerance:** Immature lymphocytes in primary lymphoid organs
 - 2) **Peripheral Tolerance:** Mature lymphocytes that encounter antigens in peripheral tissues

Def



Conflict
with
conscience

medical ethics - Microsoft PowerPoint

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Paragraph Drawing

Psychological reactions in doctor patient relationship

Variety of social and psychological reactions

1. Social bonding
2. Dependence
3. Transference
4. Counter transference
5. Resistance
6. Physician burnout

Origin in Psycho analysis

Unconscious attribution

Early signs of burnout

- Long working hours
- Loss of temper and anger
- Impaired clinical decision making
- Un prescribed use of drugs or painkiller

issues raise (transference and counter transference)
patients on a higher pedestal



From M Husnain Younas (80) to Everyone
F18-080



VIVA
MCO

Vaccination - PowerPoint

ANIMATIONS SLIDE SHOW REVIEW VIEW

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BACTERIAL VACCINES

VACCINE	TYPE	ROUTE
BCG	Live	Intradermal
Plague	Killed	I/M
Typhoid	Killed	I/M
Cholera	Killed	I/M
<u>Pertussis</u>	Killed	I/M
<u>Meningococcus</u>	Killed	I/M

combination
mca

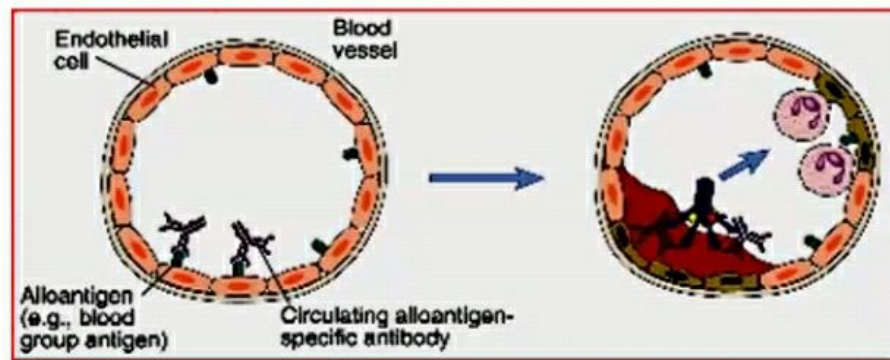
Transplantation [Protected View] - PowerPoint

IMMATIONS SLIDE SHOW REVIEW VIEW

viruses. Unless you need to edit, it's safer to stay in Protected View.

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Hyperacute Rejection



1. Preformed Ab, 2. complement activation,
3. neutrophil margination, 4. inflammation,
5. Thrombosis formation

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From Saman Afzal (Roll # 06) to Everyone
F18-006

m LG

Transplantation [Protected View] - PowerPoint

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in viruses. Unless you need to edit, it's safer to stay in Protected View.

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Clinical phases of rejection

- 1) Hyperacute rejection
- 2) Accelerated rejection
- 3) Acute rejection
- 4) Chronic rejection

CHRONIC REJECTION IS STILL HARD TO MANAGE

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101

From HUZAIFA AKRAM (Roll#101) to Everyone
F18-101

Prof Dr Muhammad Zahid Latif Community Medicine / Medic...

mca
IV

Granulomatous lesions

- In chronic diseases : T.B., Leprosy, schistosomiasis
- Intracellular organisms resist destruction by macrophage
- Persistent antigen in tissues stimulate local DTH reaction
- Continuous release of cytokines leads to accumulation of macrophages which give rise to epitheloidal and giant cell granuloma



Examples of Type IV Hypersensitivity

- Contact dermatitis
- Poison oak/ivy
- Tuberculin skin test reaction
- Stevens-Johnson syndrome
- Erythema multiforme
- Acute graft reaction
- Graft versus host disease

TYPE III
M Q

Examples

- Systemic lupus erythematosus(SLE)
- Rheumatoid arthritis(RA)
- Post-streptococcal glomerulonephritis
- Serum sickness
- Arthus reaction
- Farmer's lung

TYPE III
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HYPERSENSITIVITY - PowerPoint



Examples of Type II Hypersensitivity

- ABO transfusion reactions
- Rh incompatibility (erythroblastosis fetalis, hemolytic disease of the new born)
- Hemolytic anemia
- Neutropenia
- Thrombocytopenia
- Grave's disease
- Goodpasture's syndrome
- Rheumatic fever



SEQ
something

- **Anaphylaxis:**

- ✓ An antigen specific immune reaction, mediated primarily by IgE
- ✓ The most severe form of Type I hypersensitivity
- ✓ Severe bronchoconstriction and hypotension
- ✓ Leads to shock
- ✓ Can be life threatening
- ✓ The most common causes of anaphylaxis are peanuts, shellfish, bee venom and penicillin

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HYPERSENSITIVITY - PowerPoint

SHOW REVIEW VIEW

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Two phases of responses to Type I hypersensitivity:

Immediate response	Late phase response
Occurs minutes after repeat exposure to the allergen	2-4 hours after repeat exposure to the allergen
Caused by pre-formed mediators such as histamine, <u>heparin</u> , <u>serotonin</u> , <u>kininogenase</u> , <u>ECF-A</u> , <u>NCF</u> , <u>proteases</u>	Newly synthesized mediators such as Cytokines(IL-1, IL-4, IL-6, TNF- α), <u>Leukotrienes</u> , <u>Prostaglandins</u> , <u>Thromboxanes</u> , <u>PAF</u>
Inhibited by anti-histamines	Inhibited by corticosteroids

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HYPERSENSITIVITY - PowerPoint

SLIDE SHOW REVIEW VIEW

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Text Direction -

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Shape Outline -

Shape Effects -

Paragraph

Drawing

Type I Hypersensitivity

- Occurs within minutes of exposure to Ag
- Basically IgE mediated reactions
- Also known as Immediate/Allergic/Anaphylatic Hypersensitivity
- Provides protective response to helminths

Type-1 hypersensitivity



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Type	Time of Onset	Examples
Type-I: Immediate/ Allergic	Minutes	Anaphylaxis, Hay fever, Urticaria, Asthma, Allergic rhinitis, Allergic conjunctivitis, Food allergies (nuts, shellfish, eggs, etc), Drug allergies esp Penicillin, Bee venom, Eczema (atopic dermatitis), Latex gloves
Type-II: Ab-mediated	Hours to days	ABO transfusion reactions, Rh incompatibility (erythroblastosis fetalis, hemolytic disease of the new born), Hemolytic anemia, Neutropenia, Thrombocytopenia, Grave's disease, Goodpasture's syndrome, Rheumatic fever
Type-III: Immune complex mediated	2 to 3 weeks	Systemic lupus erythematosus (SLE), Rheumatoid arthritis (RA), Post-streptococcal glomerulonephritis, Serum sickness, Arthus reaction, Farmer's lung
Type-IV: T-cell mediated	2 to 3 days	Contact dermatitis, Poison oak/ivy, Tuberculin skin test reaction, Stevens-Johnson syndrome, Erythema multiforme, Acute graft reaction, Graft versus host disease

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Type	Immune Mediator	Antigen	Mechanism
Type-I: Immediate/ Allergic/ Anaphylactic	IgE (mainly fixed on mast cells or basophils)	Free and foreign (e.g. Pollens, House dust mites, Mold spores, Animal dander, Penicillins, etc)	Release of mediators from mast cells and basophils
Type-II: Ab-mediated	IgM, IgG Abs against cell surface or tissue Ags	Fixed and intrinsic (e.g. Ag as a part of RBC membrane or neutrophil or platelet or GBM)	-Opsonization and phagocytosis of cells -C activation -Fc receptor mediated recruitment & activation of leukocytes
Type-III: Immune complex mediated	Immune complexes of circulating Ags & Abs (IgM and IgG)	Maybe exogenous or endogenous but always free circulating	-C activation -Fc receptor mediated recruitment & activation of leukocytes
Type-IV: T-cell mediated	-CD4+ T cells (Delayed Hypersensitivity) -CD8+ CTL (T-cell mediated lysis)	Exogenous or endogenous	-Macrophage activation, Cytokine mediated inflammation -Direct target cell lysis, Cytokine mediated inflammation

HYPERSENSITIVITY - PowerPoint

HOME SLIDE SHOW REVIEW VIEW

Paragraph Drawing

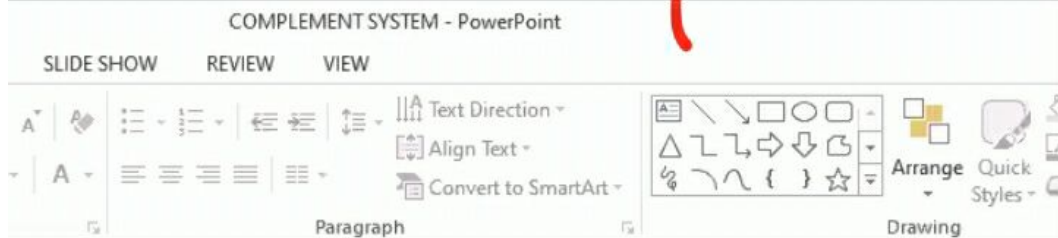
A naphylaxis
C ytotoxic
i mmune complex
D elayed type

MICROWISOME 5035

NOTES COMMENTS



m @



CLINICAL ASPECTS OF COMPLEMENT

(1) Inherited (or acquired) deficiency of some complement components, especially C5–C8, greatly enhances susceptibility to *Neisseria bacteremia and other infections*. A deficiency of MBL also predisposes to severe *Neisseria* infections. A deficiency of C3 leads to severe, recurrent pyogenic sinus and respiratory tract infections.

NOTES COMMENTS

N From Nadia Siddiq F18-97 to Everyone
f18-097

m (U)

COMPLEMENT SYSTEM - PowerPoint

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Paragraph Drawing

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- **Anaphylatoxin**
 - C3a, C4a, and C5a cause degranulation of mast cells with release of mediators (e.g., histamine), leading to increased vascular permeability and smooth muscle contraction, especially contraction of the bronchioles leading to bronchospasm
 - Anaphylatoxins can also bind directly to smooth muscle cells of the bronchioles and cause bronchospasm
 - C5a is, by far, the most potent of these anaphylatoxins

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Paragraph Drawing

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- **Chemotaxis**
 - C5a and the C5,6,7 complex attract neutrophils
 - They migrate especially well toward C5a
 - C5a also enhances the adhesiveness of neutrophils to the endothelium

NOTES COMMENTS

C3b = OP50 nin

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Text Direction -
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Convert to SmartArt -

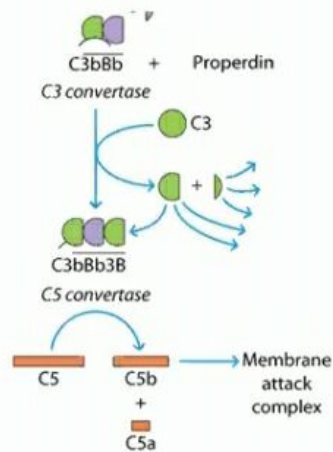
Paragraph

Shape Fill -
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Drawing

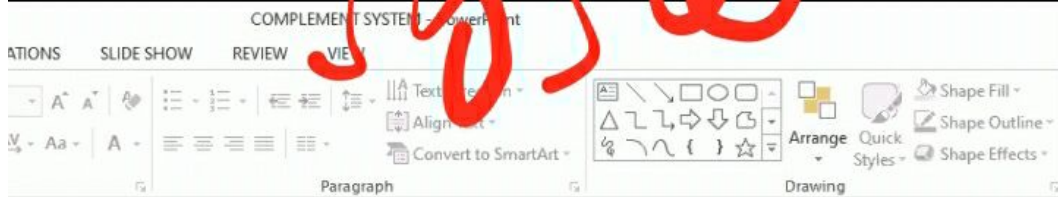
C5 activation complex

- When an additional C3b binds to the C3 activation complex it converts it into a C5 activation complex
- The C5 activation complex cleaves C5 into C5a and C5b
- C5b begins the production of the MAC



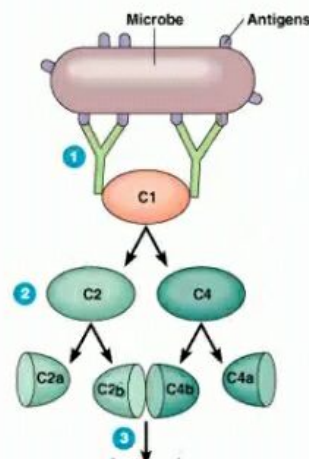
NOTES COMMENTS

Draw complement system



The building of a C3 activation complex

- Once C1 is activated, it activates 2 other complement proteins, C2 and C4 by cutting them in half
- C2 is cleaved into C2a and C2b
- C4 is cleaved into C4a and C4b
- Both C2b and C4b bind together on the surface of the bacteria
- C2a and C4a diffuse away



MQ

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FILE HOME SLIDE SHOW REVIEW VIEW

Paragraph Drawing

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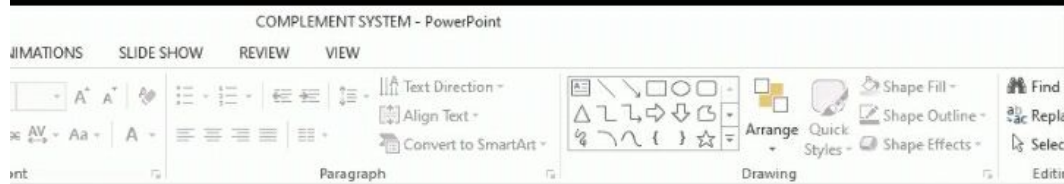
- Out of these pathways, the lectin and the alternative pathways are more important the first time we are infected by a microorganism because the antibody required to trigger the classic pathway is not present
- Therefore, lectin pathway and the alternative pathway are participants in the innate arm of the immune system

NOTES COMMENTS

HF From HassanAhmad F18-046 to Everyone
F18-046

S From TAYYABA 129 to Everyone
F18-129

MKS
SLE



The Functions of Complement

- Lysis of cells, such as bacteria, viruses, allografts and tumor cells – the major effector of the humoral branch of the immune system
- Opsonization, which promotes phagocytosis of particulate Ags
- Generation of mediators that participate in inflammation and attract neutrophils
- Immune clearance, which removes immune complexes from the circulation and deposits them in the spleen and liver

mef

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ANIMATIONS SLIDE SHOW REVIEW VIEW

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- Synthesized mainly by the liver and normally circulate as inactive precursors (pro-protein)
- When stimulated by one of several triggers, proteases in the system cleave specific protein to release cytokines and initiate an amplifying cascade of further cleavage
- Inactivated by heating serum at 56°C for 30 minutes



From Hamza Farooq (043) to Everyone
F18-043

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Leave

Regulatory functions of T cells

- Antibody production
- Cell mediated immunity
- Suppression of certain immune responses



AS

From Anmol Shaheen to Everyone
F18-014



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SEER

Effector functions of T cells

- Th1--- Delayed hypersensitivity
- Th2--- Protection against helminths
- Th17--- Protection against bacterial infections
- CD8 cells--- Protection against viral infections



A From AMINA ARIF Unknown to Everyone
f18-010



Mechanisms of action of CD8 T cells

- In some cases, T_C cells:
- Bind to the target cell and release perforin into its membrane
 - In the presence of Ca²⁺ perforin causes cell lysis by creating transmembrane pores
- Other T_C cells induce cell death by:
 - Secreting lymphotoxin, which fragments the target cell's DNA
 - Secreting gamma interferon, which stimulates phagocytosis by macrophages

mca

Subsets of Helper T cells

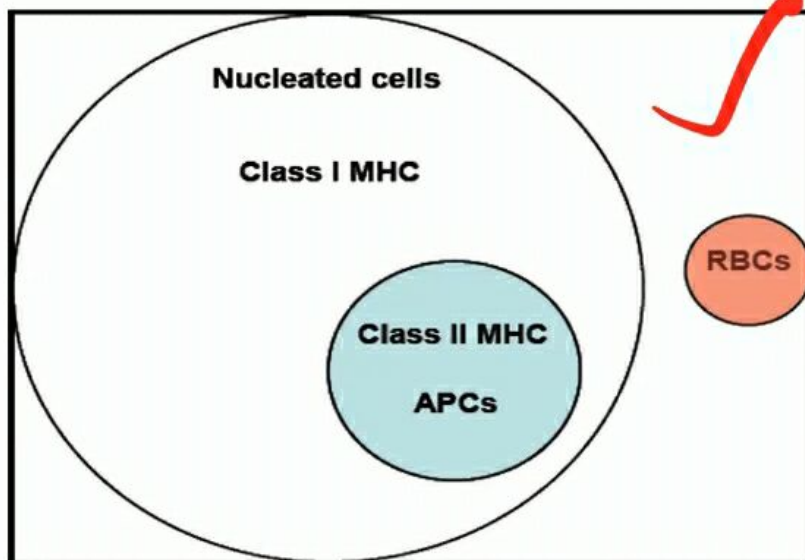
- Three main subsets of Th cells:
 - i. Th1--- Delayed hypersensitivity with the help of macrophages and gamma interferon
 - ii. Th2--- Humoral immunity (secretion of antibodies by plasma cells), role in allergy (protection against helminths through the production of IgE and activation of eosinophils)
 - iii. Th17--- Protection against bacterial infections by recruiting neutrophils to the site of infection (tissue inflammation)

Antigen Processing and Presentation through MHC

- Antigen uptake
- Antigen processing (fragmentation of protein Ag into peptides)
- MHC biosynthesis
- Association of peptide with MHC molecule
- Transport to cell surface for expression
- Different cellular pathways for association of peptide with MHC class I and class II molecules

MUG

Distribution of MHC





Tauseef Amnc

 GIF

Reply

Mark as read



➤ **Primary Ab response:**

- Occurs after first encounter with antigen
- Slow, sluggish & short lived
- Antibody produced is IgM

➤ **Secondary Ab response:**

- Occurs after re-exposure with the same antigen
- Rapid, powerful & prolonged
- Antibody produced is IgG

Class Switching

- The process by which an individual B cell can link Ig heavy chain C genes to its recombined V genes to produce a different class of antibody with the same specificity



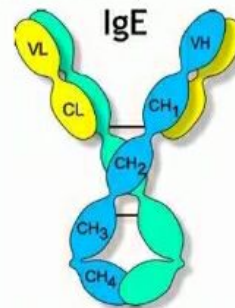
Immunoglobulin Allotypes

- Amino acid sequences within C-region of Ig H and L chains that are different between individuals of the same species
- Importance
 - Monitoring bone marrow grafts
 - Forensic medicine
 - Paternity testing

VIMP

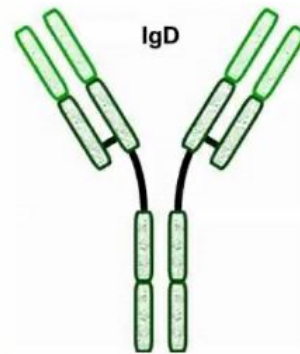
IgE

- Mediates Immediate Hypersensitivity by release of mediators from mast cells and basophils upon exposure to antigen
- Main host defense against helminth infections by release of enzymes from eosinophils
- Does not fix complement

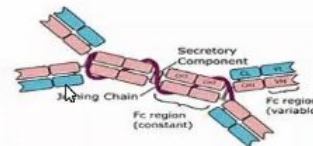


IgD

- Found on surface of mature B-cells
- Biological function unknown (thought to function in activation of B-cells)



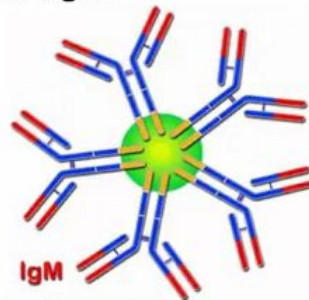
IgA



- Main immunoglobulin in secretions i.e. Breast milk, Saliva, tears, mucus
- Secretory IgA prevents attachment of bacteria and viruses to mucous membrane
- Does not fix complement
- Provides passive immunity to infants through mother's breast milk

IgM

- Produced in primary response to an antigen
- Fixes complement
- Does not cross the placenta
- Antigen receptor on the surface of B cells





IgG

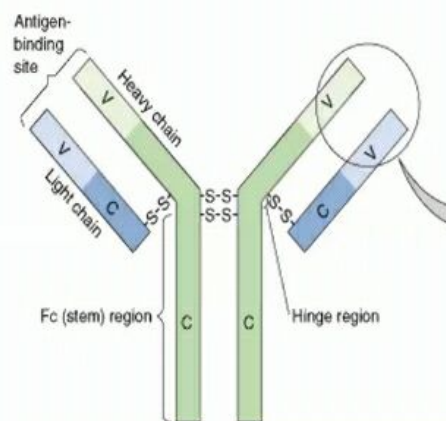
- Most abundant isotype in serum (80%)
- Crosses the placenta and play an important role in providing passive immunity to the fetus
- Predominant Ab in secondary response
- Acts as an opsonin—phagocytosis
- Activates complement system
- Neutralizes bacterial toxins and viruses



ASQ

Structure of Antibodies

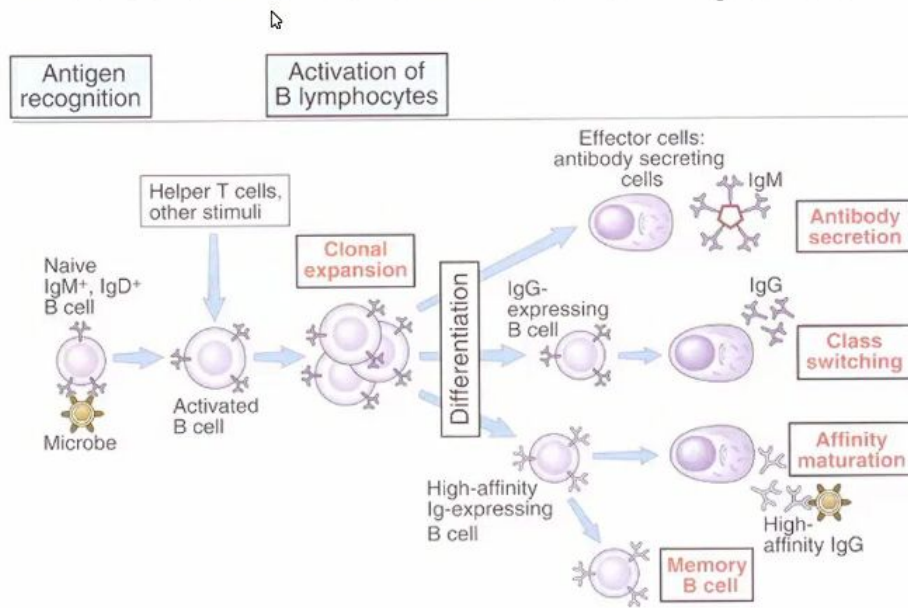
- The stem of the antibody molecule as well as the lower portion of the arms called **constant (c)** regions
- There are 5 major types of C regions which correspond to the 5 different classes of antibodies
- All plasma cells in the body are producing one of these classes of antibodies
- A particular plasma cell may switch the particular class of antibody that it is producing in order to fight an infection in a different way



(a) Antibody molecule

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Phases of humoral immune response

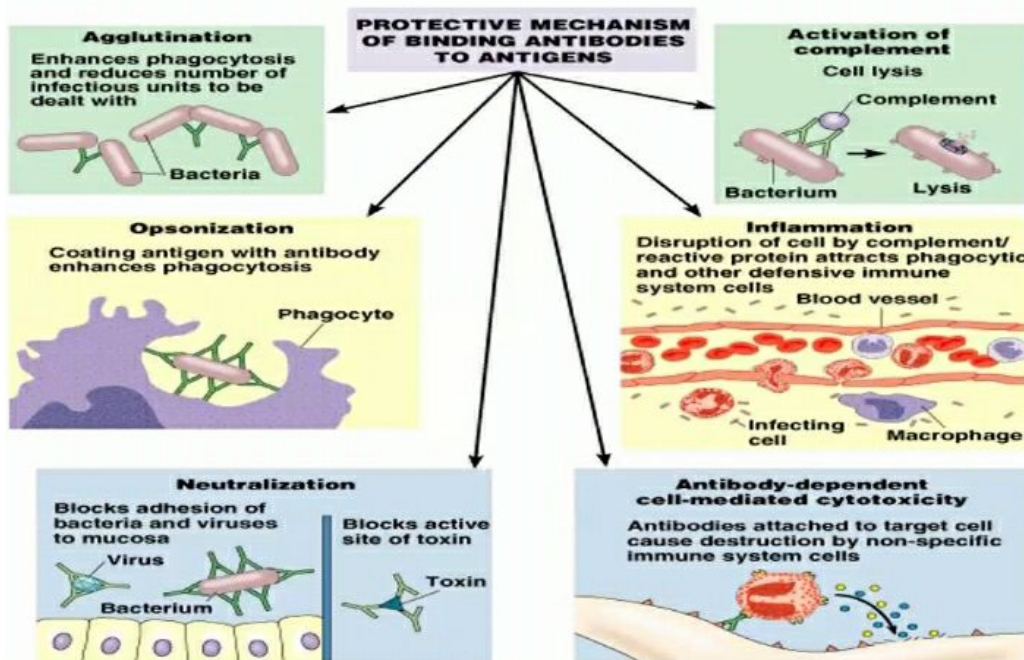


Memory cells

- Memory cells do not react right away but are held in reserve for later infections
- The secondary response that is carried out by memory cells is different in 3 ways:
 - i. Memory cells produce antibodies that bind with greater affinity to their antigens than the antibodies produced in the initial response
 - ii. The response time is much quicker than the primary response
 - iii. A greater number of antibodies are produced

Question

Functions of Antibodies



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