

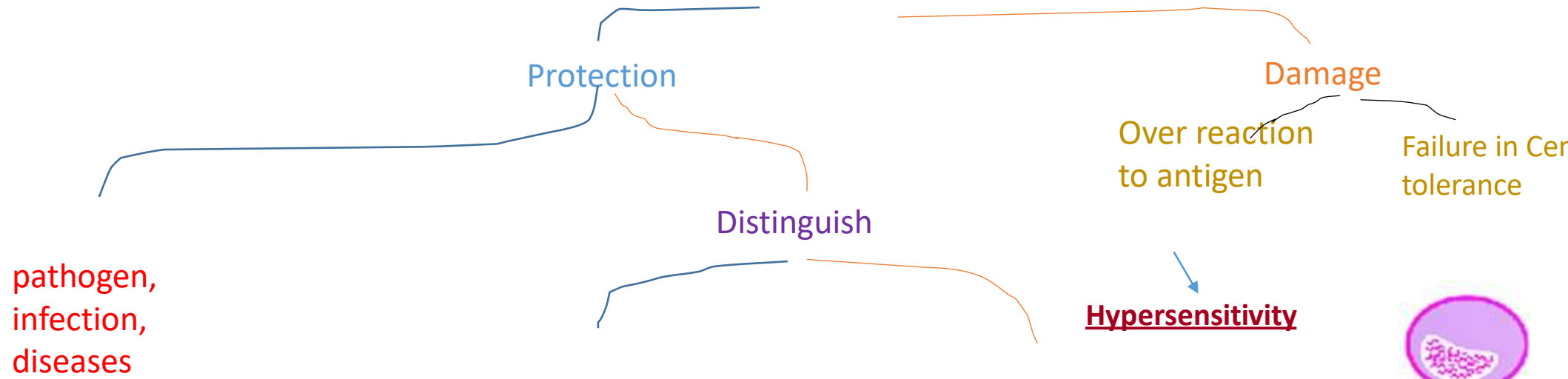
Hypersensitivity

Dr. Sundus Abdul Wadood

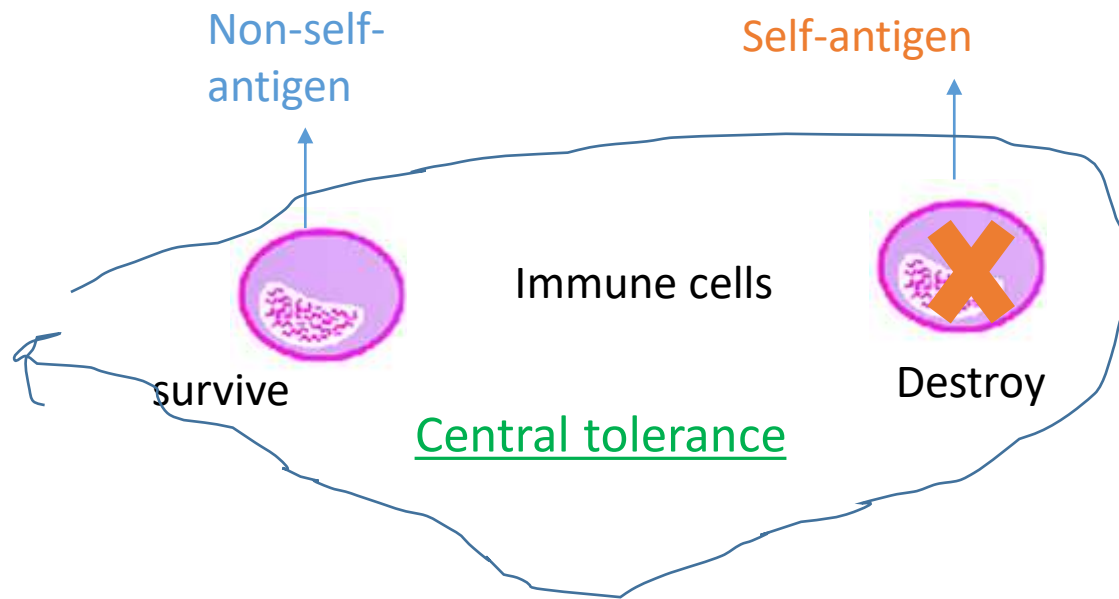
OMFS

Basrah Dental College

Immune System



- Primary Lymphoid Organ
- Thymus- T Cell
- Bone Marrow- B Cell



Some cells skip



Auto immune diseases

Hyper sensitivity

Greek word means
over or above

Ability to detect and response to
To slight changes and signals

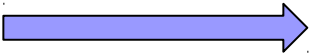
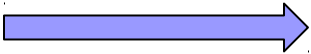
Any immune response that is **excessively** above normal

Hypersensitivity

- ♣ **Hypersensitivity (Immunological reaction)** refers to **undesirable immune reactions** produced by the normal immune system.
- ♣ **Hypersensitivity or allergic reactions:** When an immune response result in **exaggerated OR in appropriate reactions** harmful to the host.
- ♣ **Hypersensitivity reactions:** four types; based on the **mechanisms** involved and **time taken** for the reaction, a **particular clinical condition (disease)** may **involve more than one type of reaction.**

Types of Hypersensitivity

- Type I : IgE Immediate hypersensitivity
- Type II: Antibody- mediated cytotoxic hypersensitivity
- Type III: Immune complex mediated hypersensitivity
- Type IV: Cell mediated hypersensitivity

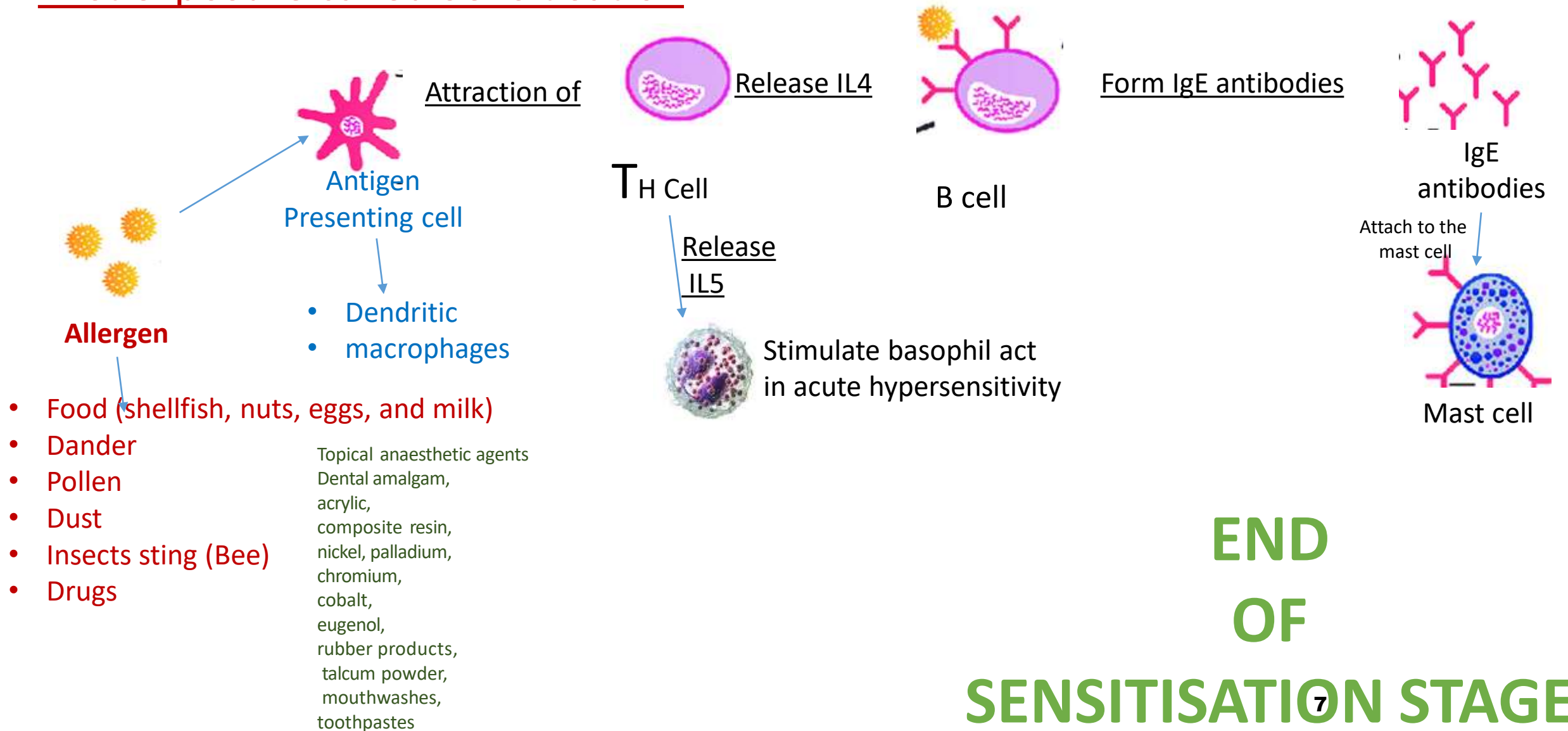
-
- | | | |
|--------------------|---|---------------------|
| • Type I, II & III |  | • Antibody Mediated |
| • Type IV |  | • Cell Mediated |

Types of Hypersensitivity

- Type I : Allergy, Atoppy and Anaphylactic
- Type II: AntiBody- mediated
- Type III: Immune Complex
- Type IV: Delayed

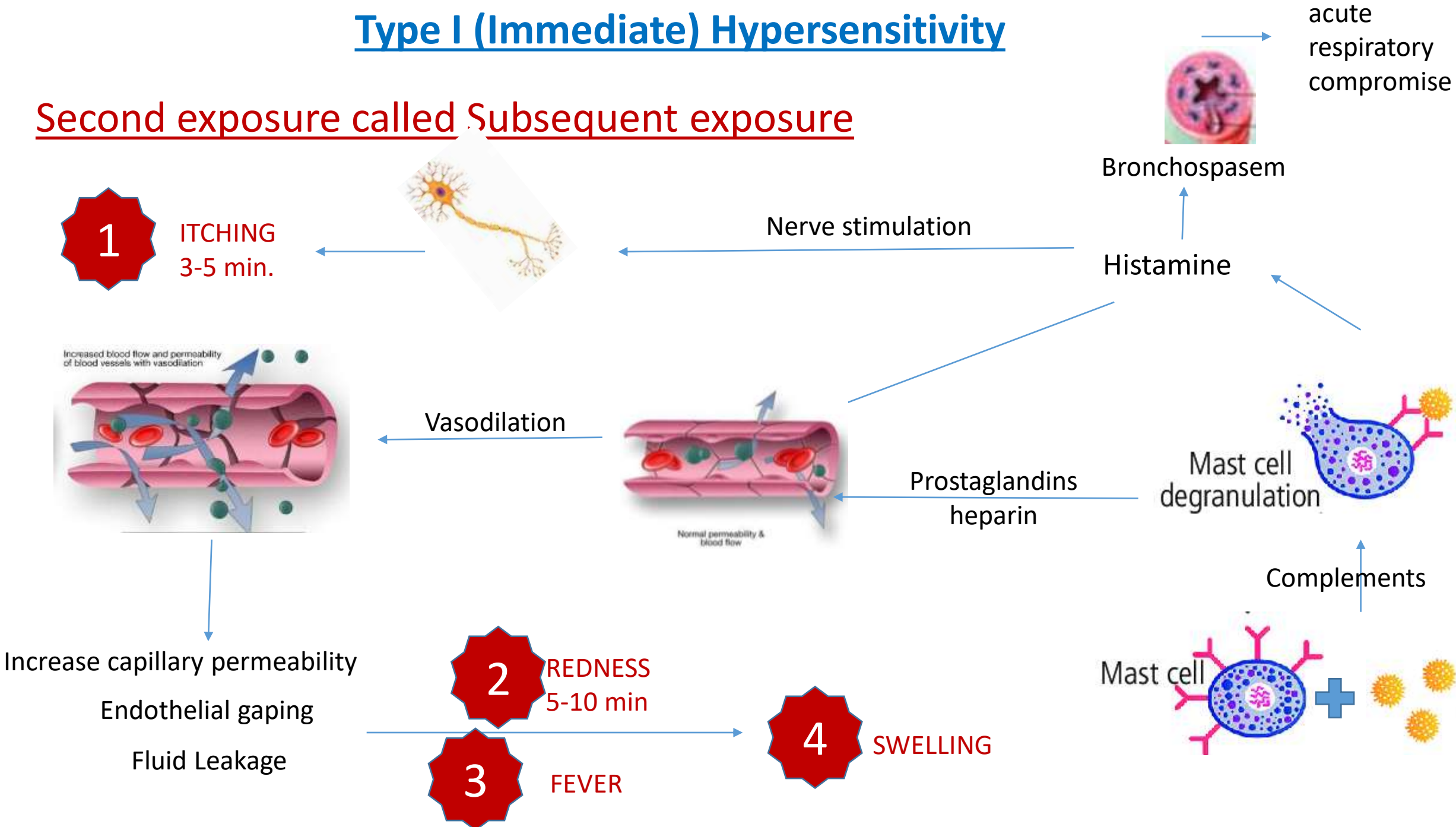
Type I (Immediate) Hypersensitivity

First exposure called Sensitisation



Type I (Immediate) Hypersensitivity

Second exposure called Subsequent exposure



Symptoms of Anaphylaxis

THINK "FAST"



Type I (Immediate) Hypersensitivity

Immediate
3-30 min.

Allergic reaction

- Food (shellfish, nuts, eggs, and milk)
- Dander
- Pollen
- Dust
- Insects sting (Bee)
- Drugs
- Contact (latex, Lotions and soaps)



Atopy

is a hypersensitivity state that is influenced by hereditary factors

- Hay fever,
- asthma,
- urticaria, superficial lesion of the skin



Anaphylaxis

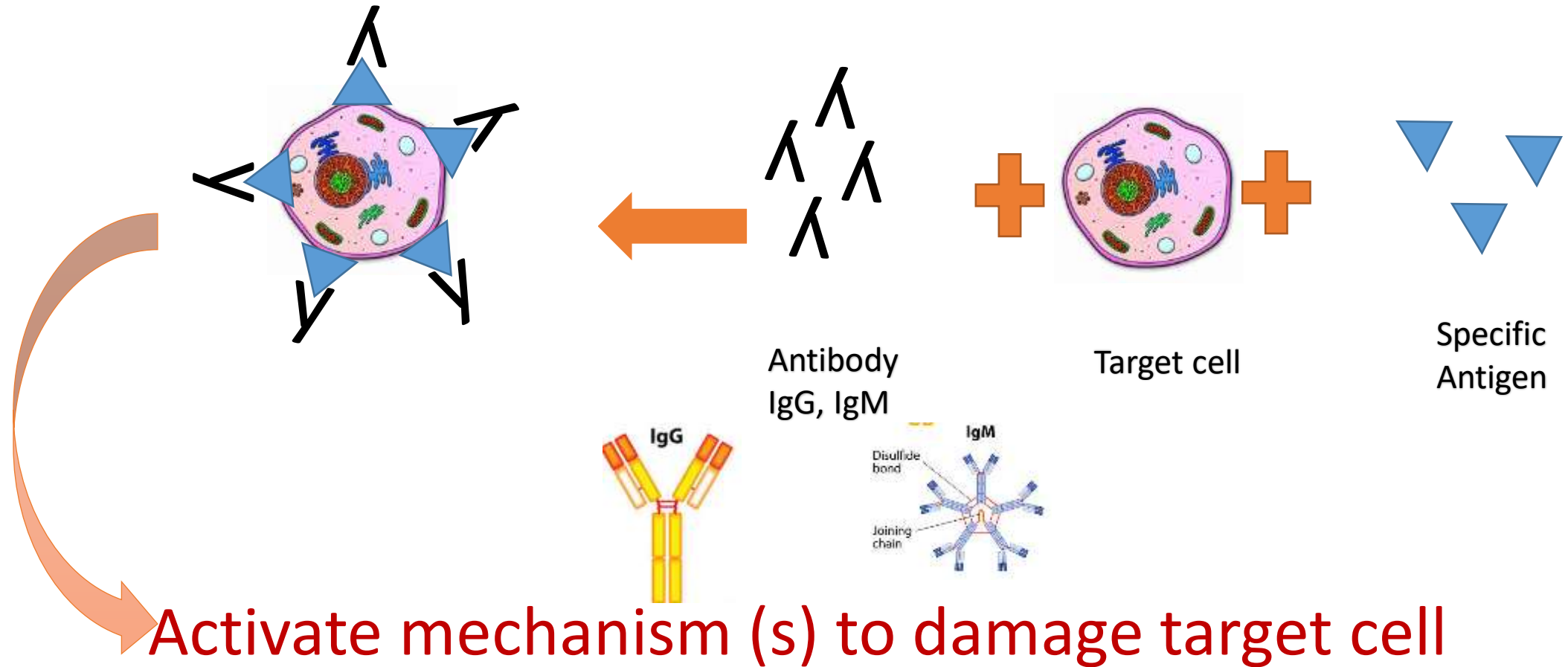
is an acute reaction involving the smooth muscle of the bronchi in addition to the other sign and symptom mentioned in previous slide

acute respiratory compromise



cardiovascular collapse

Type II: Antibody-mediated cytotoxic hypersensitivity



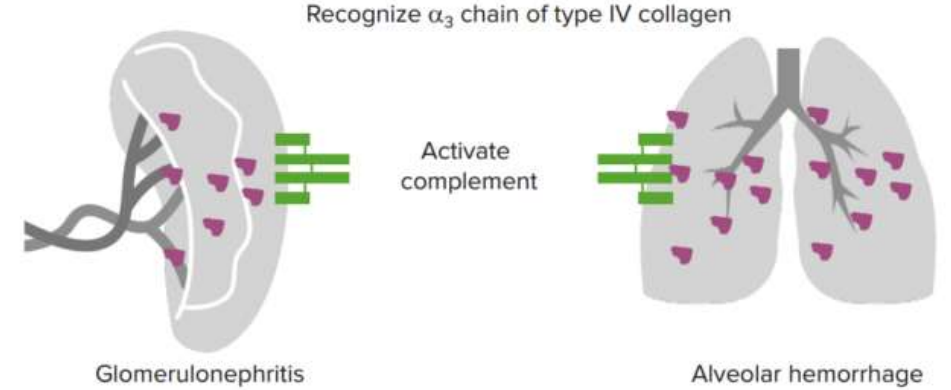
Type II: Antibody-mediated cytotoxic hypersensitivity

1- Antibody complement-mediated distraction

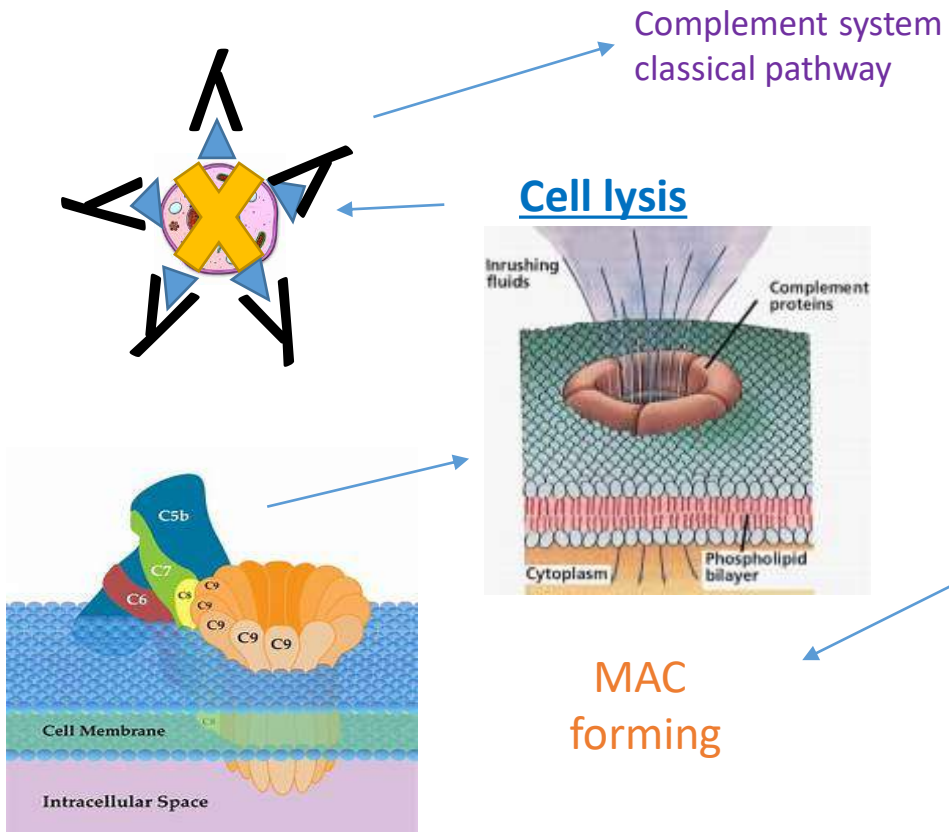
Example →

- Autoimmune haemolytic anaemia – Antibody against RBC
- Mismatch transfused blood cells – Before blood transfusion
- Erythroblastosis Fetalis – Mother Rh-, Father Rh *
- Goodpastures syndrome – Autoimmune antibody against

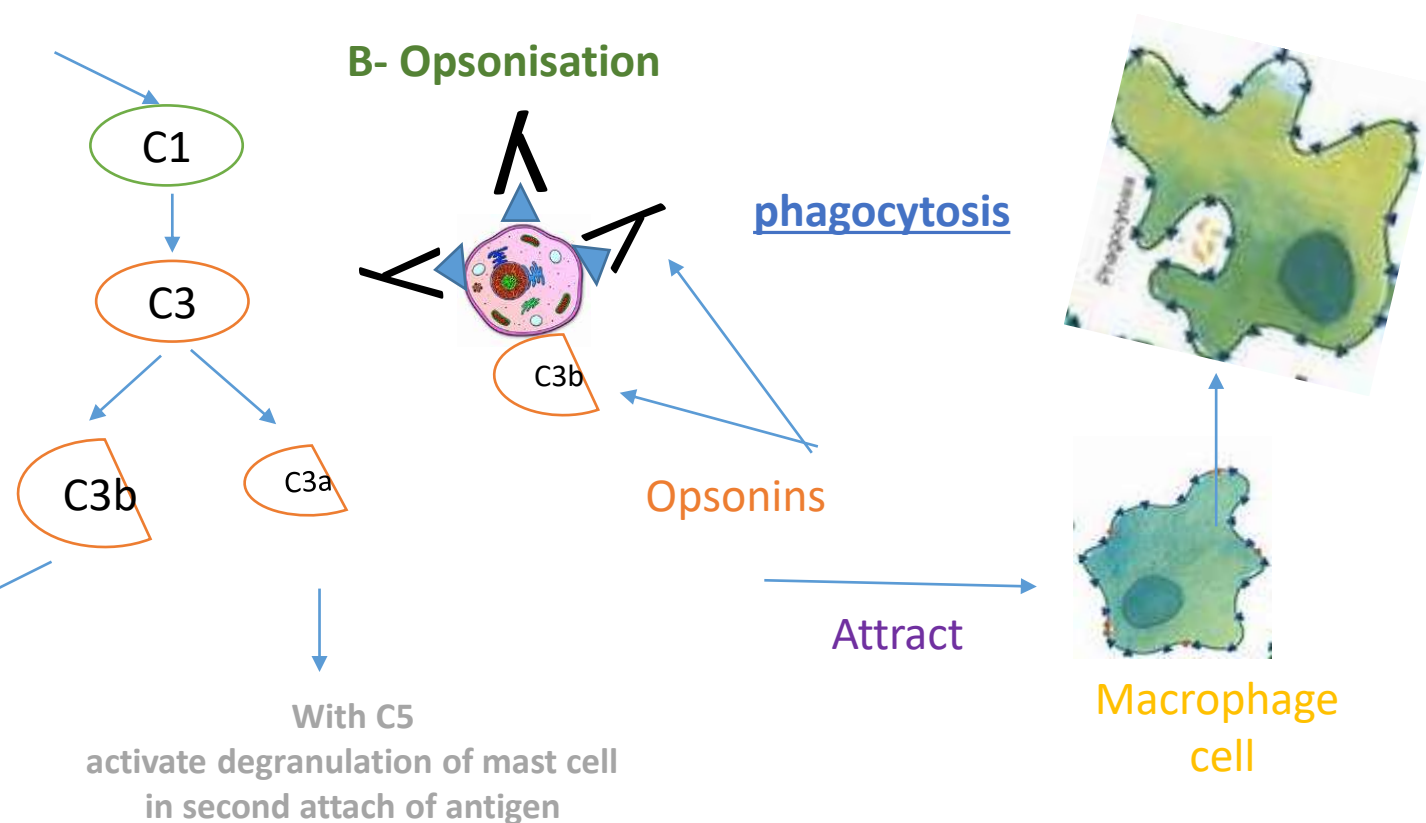
Autoantibodies bind to glomerular/alveolar basement membrane



A- Formation of membrane attack complex (MAC)

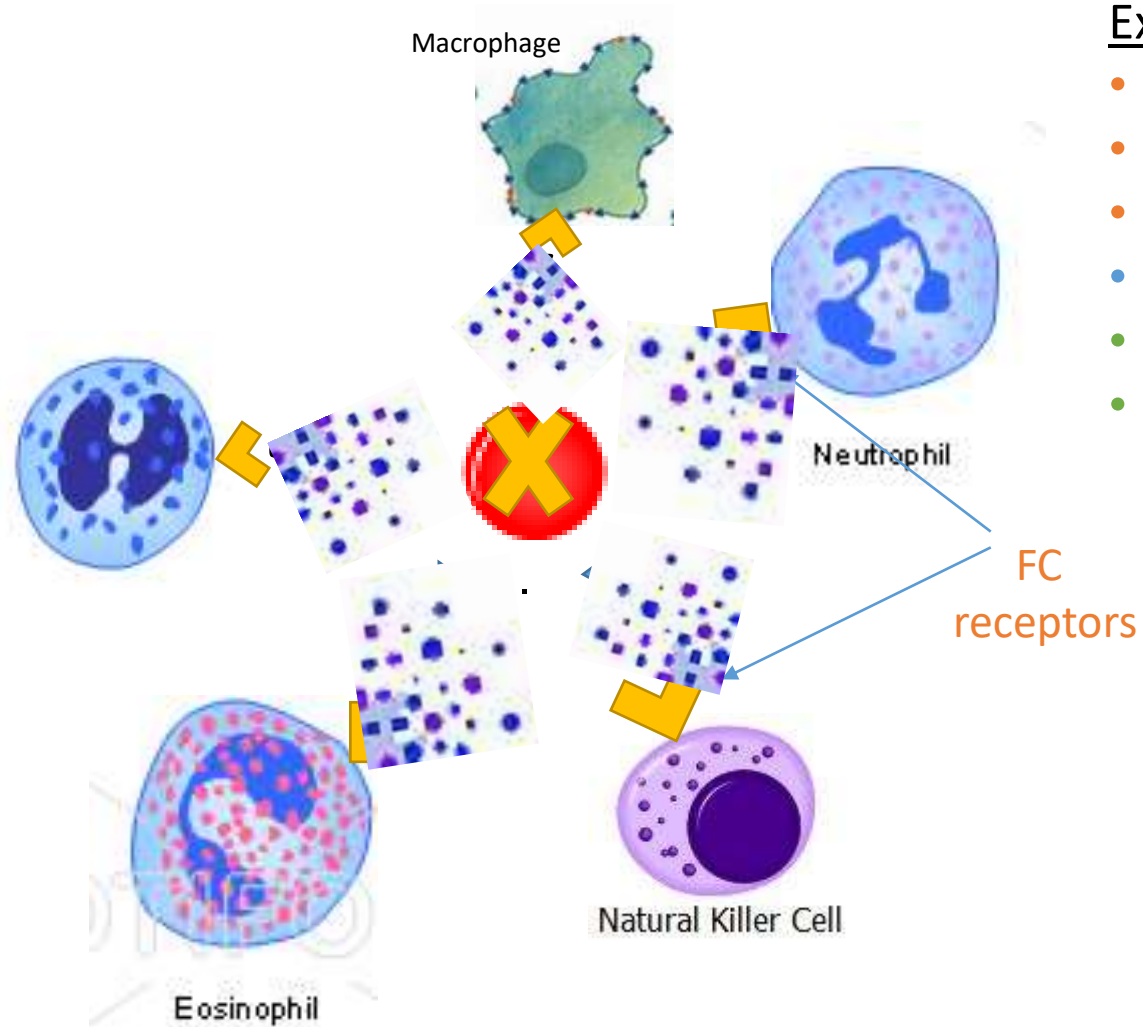


B- Opsonisation



Type II: Antibody-mediated cytotoxic hypersensitivity

2- Antibody- Dependent Cell - mediated Cytotoxicity (ADCC)



Example:

- Medication induce – Haemolytic anaemia
- Medication induce – Thrombocytopenia
- Medication induce – Neutropenia
- Transplant rejection
- Immune reaction against – Parasites
- Immune reaction against – Neoplasm

Type II: Antibody-mediated cytotoxic hypersensitivity

Duration
Minutes - Hours

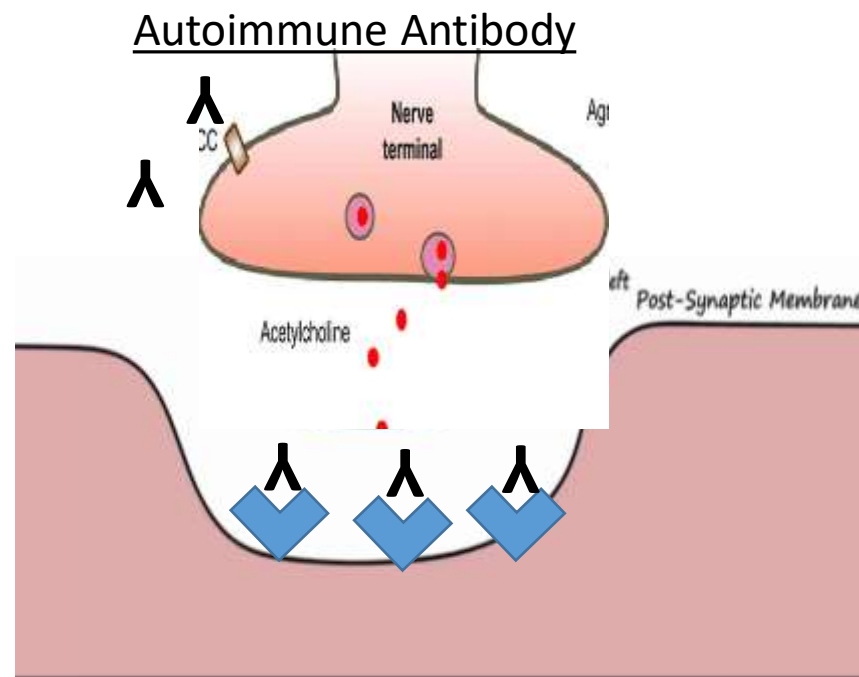
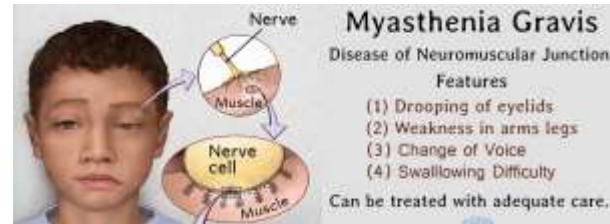
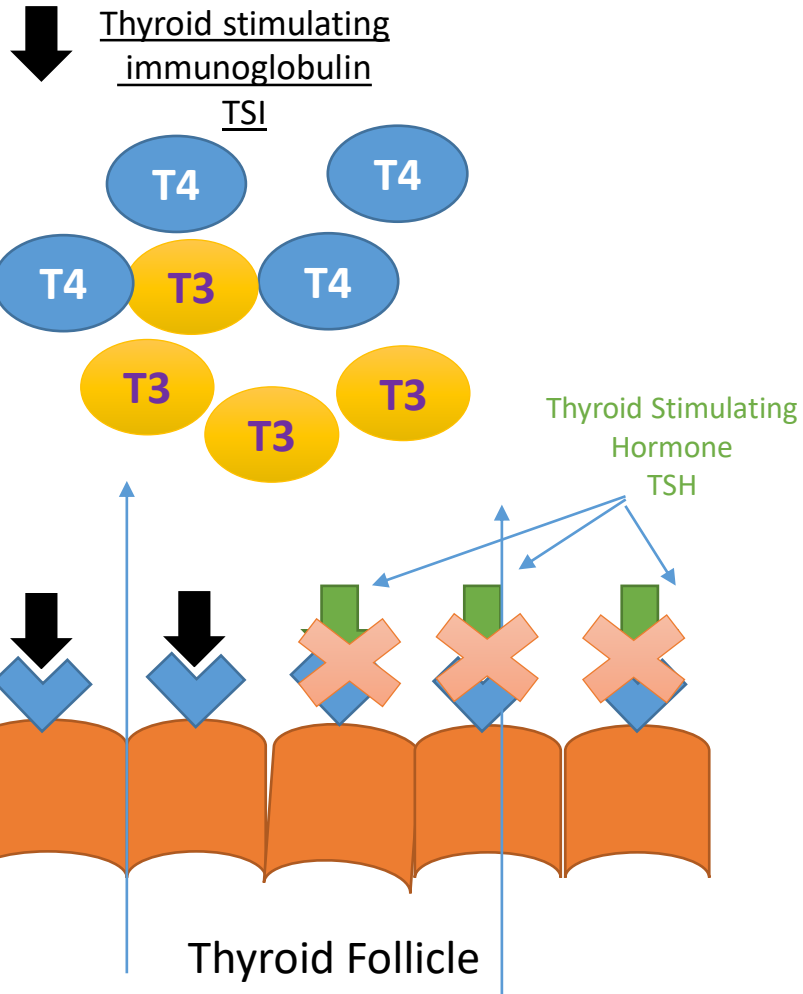
3 – Target cell Dysfunction

Graves' Disease
Hyperthyroidisms

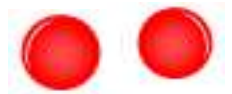
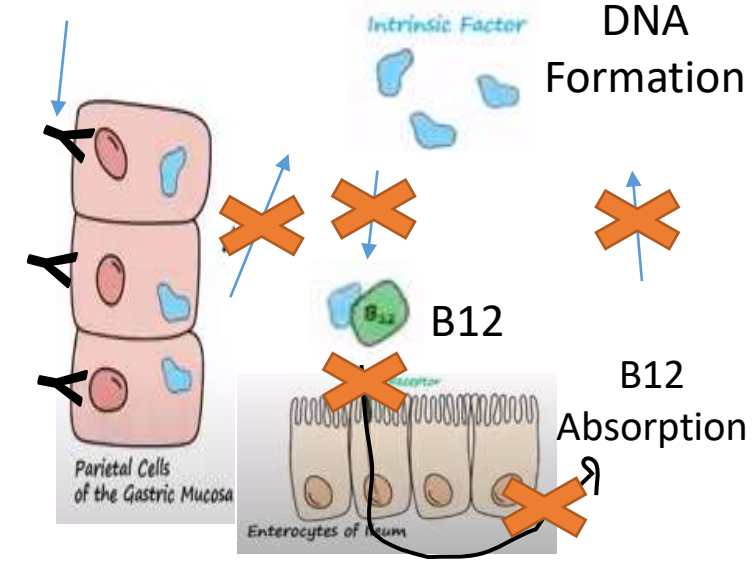
Myasthenia Graves
Muscle Weakness

Pernicious Anaemia

Anaemia



Antibody against
Partial cell
Intrinsic Factor

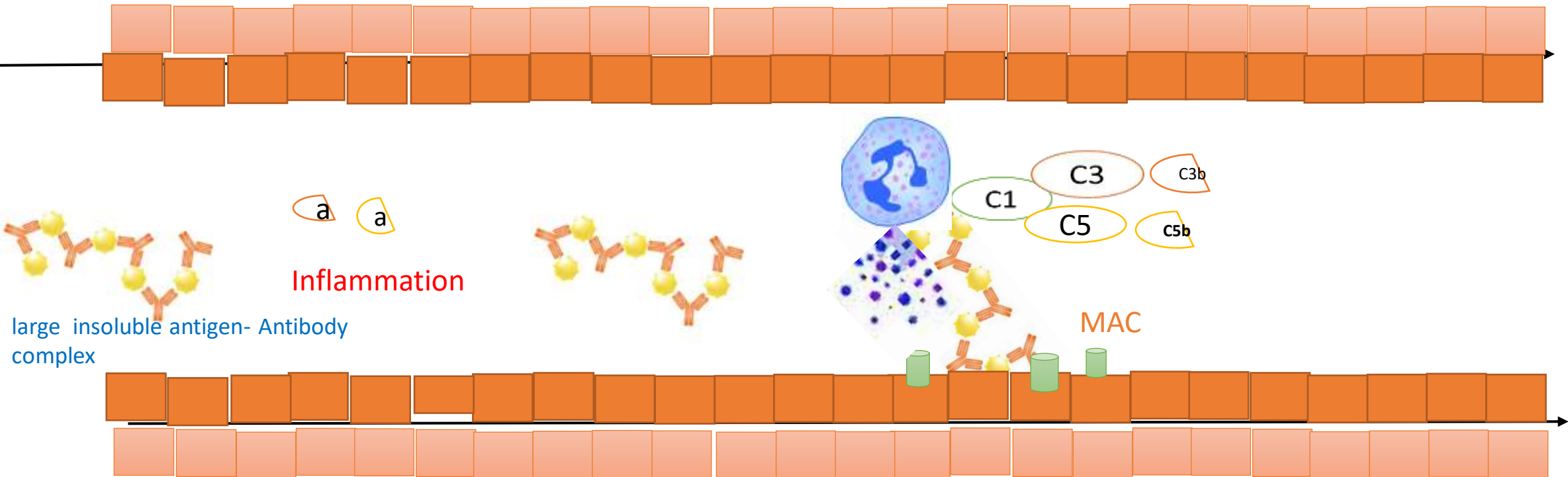
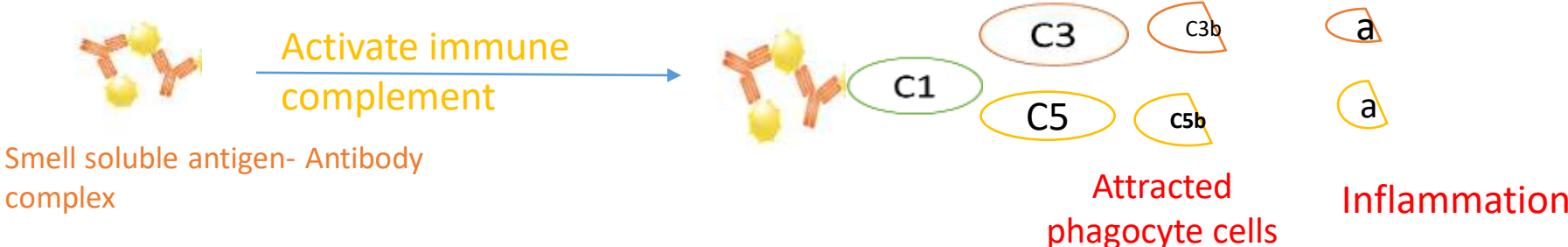


RBC

DNA
Formation

B12
Absorption

Type III: Immune complex mediated hypersensitivity



Antigen in this type DNAMore damaging to the cells.....More DNA release.....More Ag-Ab complex form

Type III: Immune complex mediated hypersensitivity

Component

Type of antigens

- Protein from a pathogen (exogenic)
 - Glycoprotein
 - Nucleoprotein
 - Clotting Factors
 - DNA
 - IgG
- (endogenic)

Complement Proteins

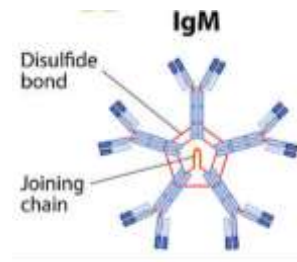
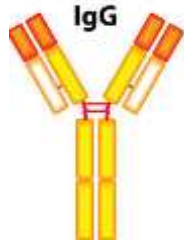
C1, C2, C4, C3, C5,C9

Immune Cells

- Neutrophil
- Macrophage
- Natural Killer cell
- Mast cell

Types of Antibodys

- IgG
- IgM



Type III: Immune complex mediated hypersensitivity

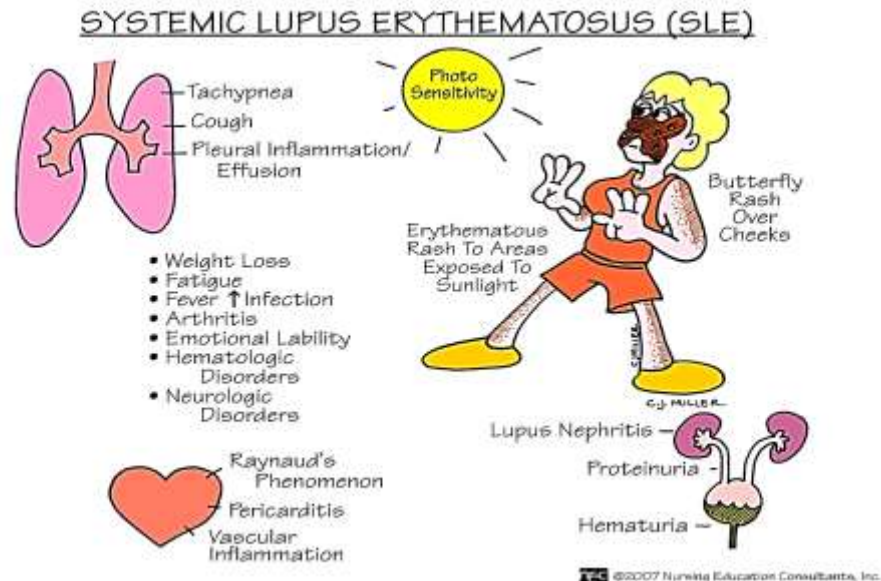
Duration
3-8 Hours

The large insoluble Ag-Ab
Complex Attach



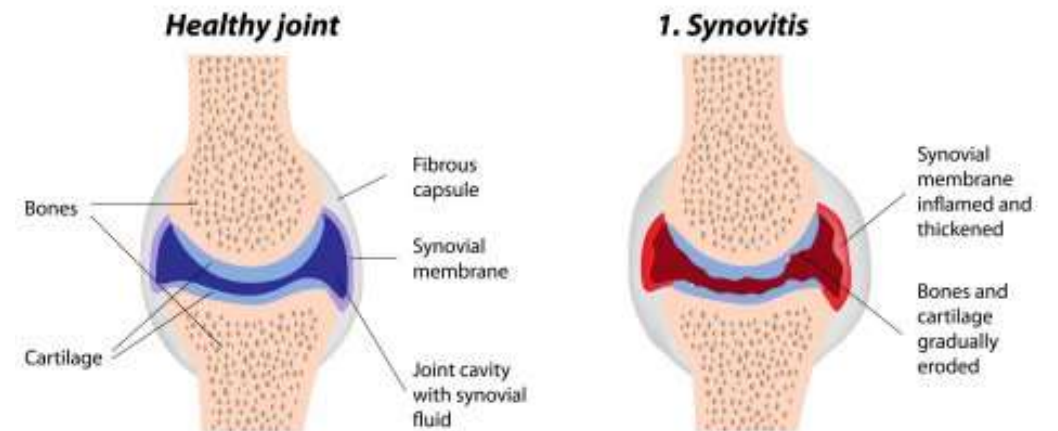
Example:

Systemic Lupus Erythematosus (SLE)



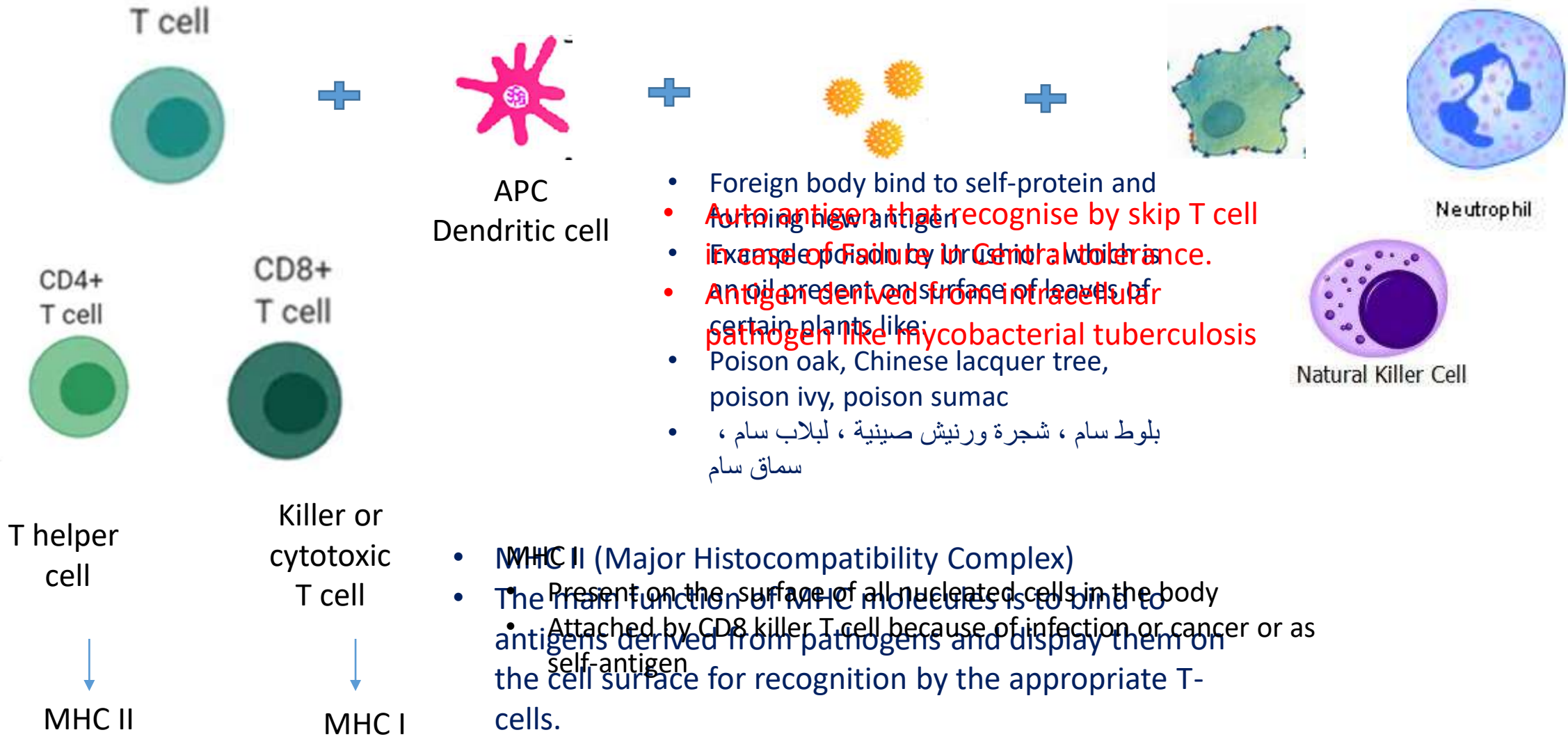
Rheumatoid Arthritis

Stages of Rheumatoid Arthritis



Type IV : Cell mediated hypersensitivity

Component

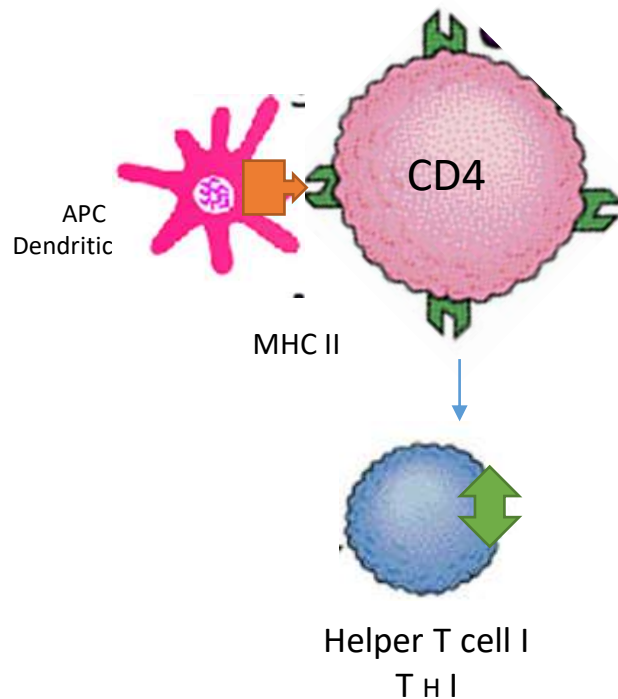


Type IV : Cell mediated hypersensitivity

Occur in Two Stages

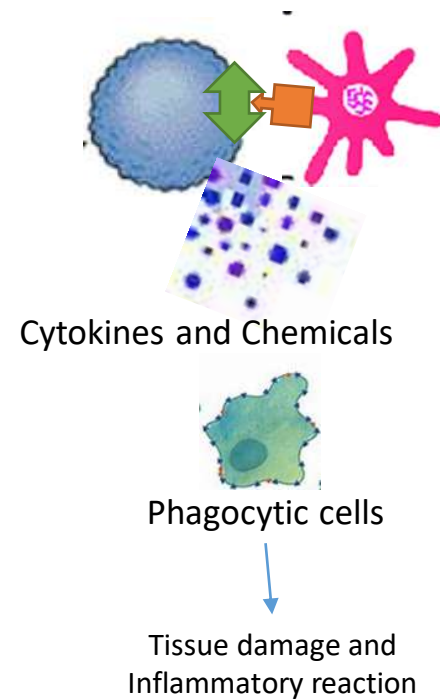
Sensitization
after first exposure

1-2 weeks



Effective stage
after second exposure

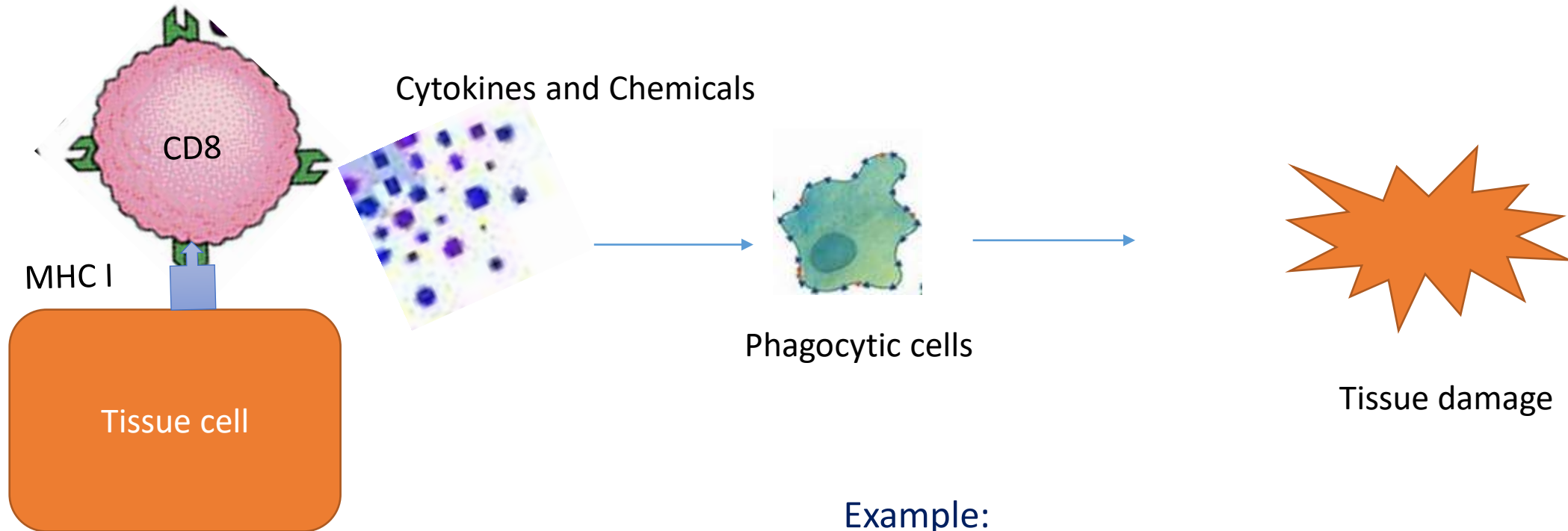
1-2 days
after second exposure



Example:

- Contact dermatitis (Contact (latex, Lotions soaps))
- Tuberculosis
- Inflammatory Bowel disease
- Temporal arthritis
- Granuloma

Type IV : Cell mediated hypersensitivity



Example:

- IDDM
- Hashimoto thyroiditis
- Transplants rejection

MHC I

- Present on the surface of all nucleated cells in the body
- Attached by CD8 killer T cell because of infection or cancer or as self-antigen



THANK YOU



Particles in air (allergens)

- Pollen
- Dust mite debris
- Animal dander

Allergic symptoms

- Watery eyes
- Runny nose
- Itchy throat

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Food Allergies