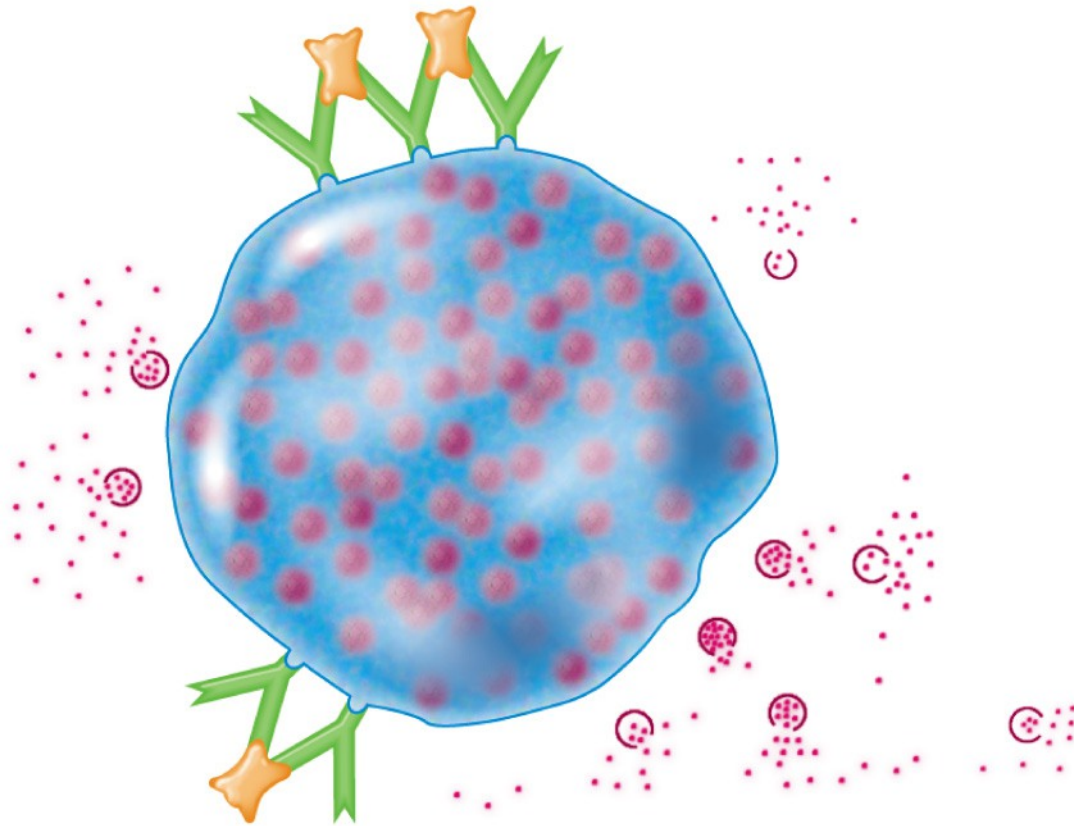


C21.8
(Featured Slides with Comments)

Hypersensitivity



Four Different Types of Hypersensitivity

- Hypersensitivity reactions are exaggerated or inappropriate immunologic responses occurring in response to an antigen or allergen.
 - Type I, II and III hypersensitivity reactions are known as immediate hypersensitivity reactions because they occur within 24 hours of exposure to the antigen or allergen. /// These are a result of the antibodies actions
 - *Type IV hypersensitivity is a T cell response and is delayed*
-

Four Different Types of Hypersensitivity

Four kinds of hypersensitivity based on the type of immunity (antibodies or T cells) and response to antigen

Type I acute hypersensitivity

- very rapid response // within seconds resolves in 30 mi
- antigen binds to E class antibody receptors
- mast cells release histamine (and heparin)
- local vs systemic
- local = Food allergies and asthma
- systemic = Anaphylactic shock

Type II - antibody dependent cytotoxic sub-acute

slower onset (1 – 3 hours after exposure

last longer – 10 to 15 hrs)

G and M class antibodies bind to antigen on cell

Antibodies activate complement

Four Different Types of Hypersensitivity

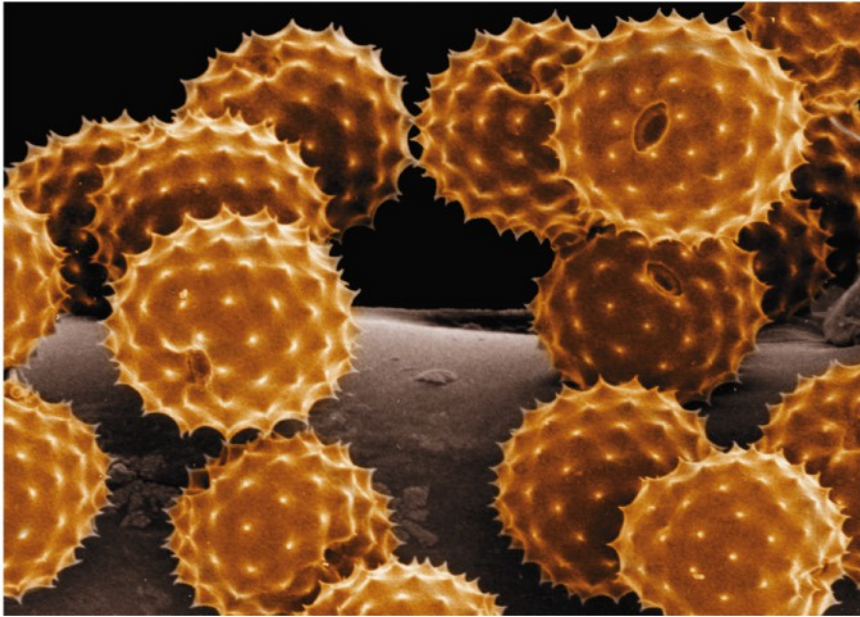
Type III - immune complex hypersensitivity

- sub-acute /// slower onset // 1 – 3 hours after exposure
- last longer – 10 to 15 hrs
- Form antibody-antigen complex under endothelium and other tissues
- Stimulate intense inflammation
- Autoimmune diseases systemic lupus and glomerulonephritis

Type IV - delayed hypersensitivity

- T-Cell mediated response
- Response time 12-72 hours
- Graft rejections and poison ivy

Type I - Localized Anaphylaxis



SEM

40 μm

(a) A micrograph of pollen grains

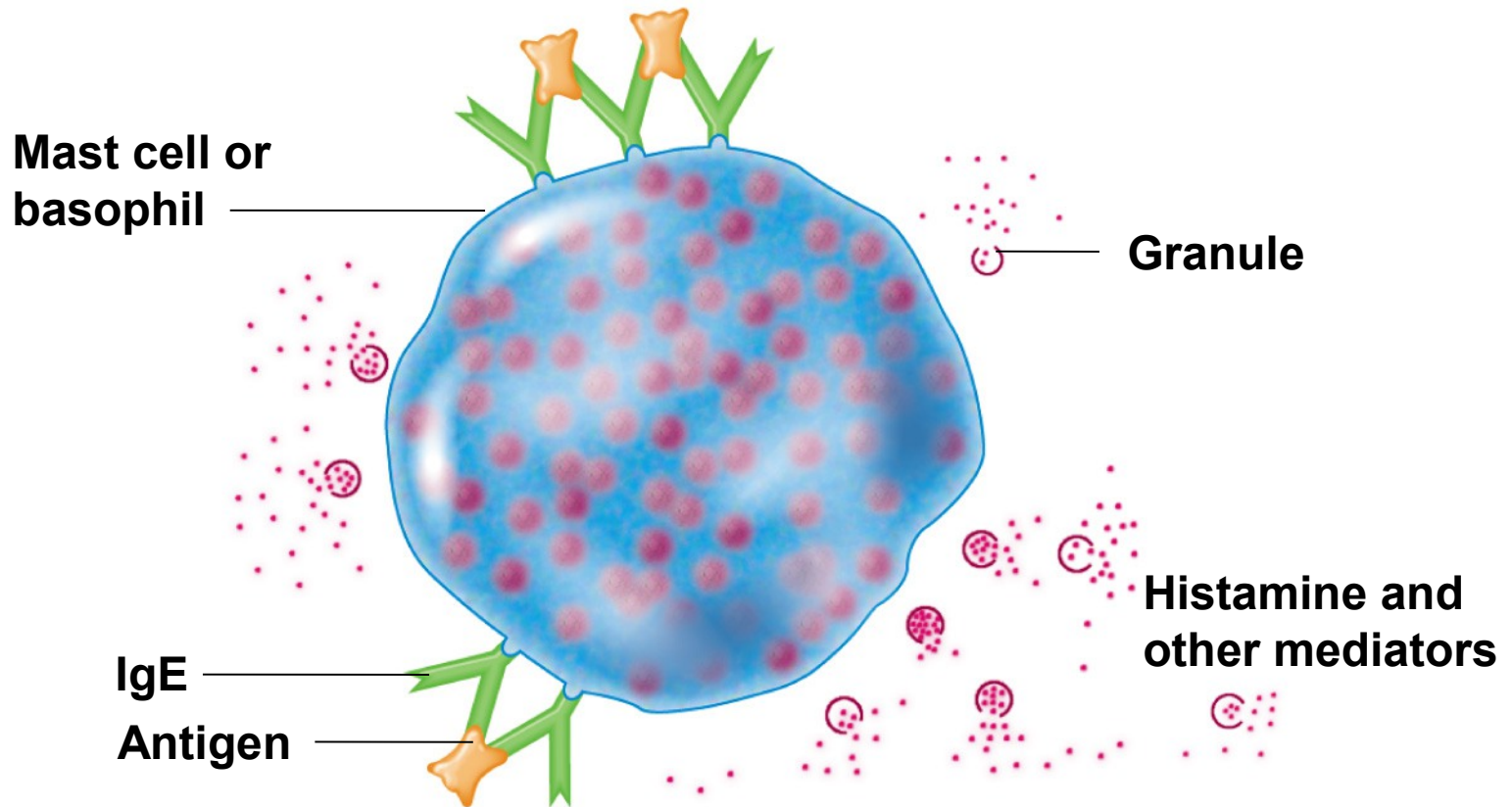


SEM

55 μm

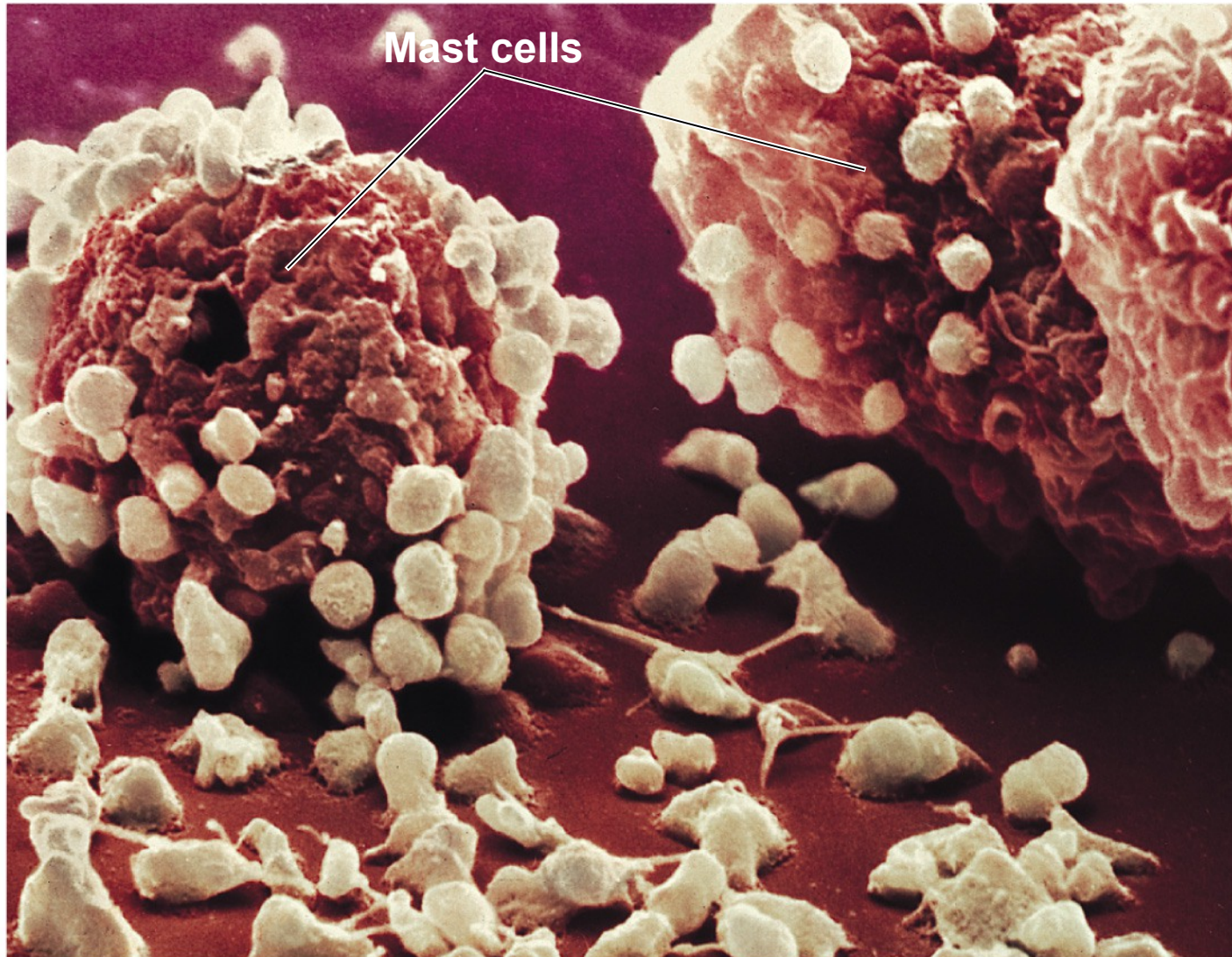
(b) A micrograph of a house mite on fabric

Type I // The Mechanism of Anaphylaxis



(a) IgE antibodies, produced in response to an antigen, coat mast cells and basophils. When an antigen bridges the gap between two adjacent antibody molecules of the same specificity, the cell undergoes degranulation and releases histamine and other mediators.

Type I - The mechanism of anaphylaxis.

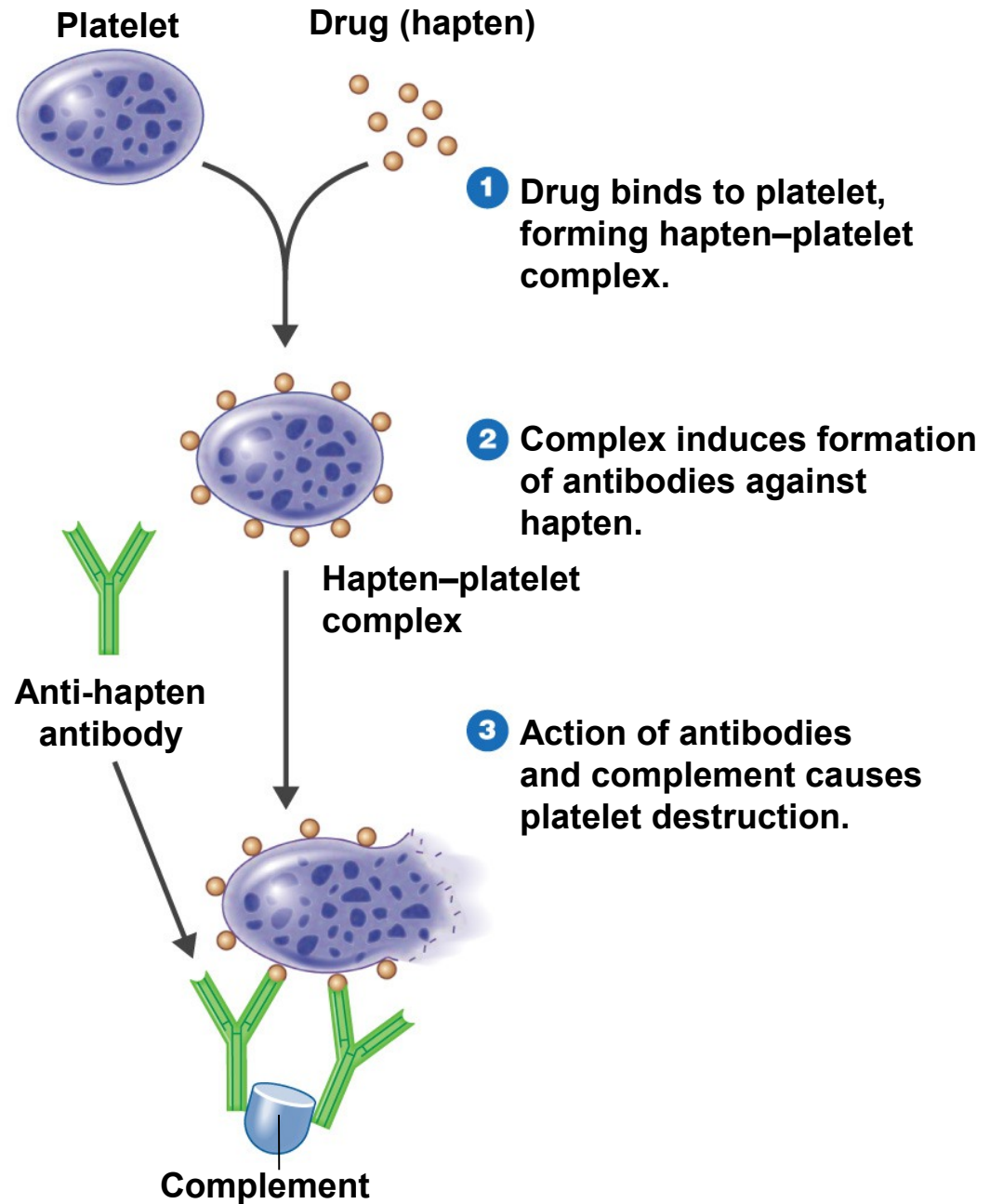


SEM

10 μ m

A degranulated mast cell that has reacted with an antigen and released granules of histamine and other reactive mediators

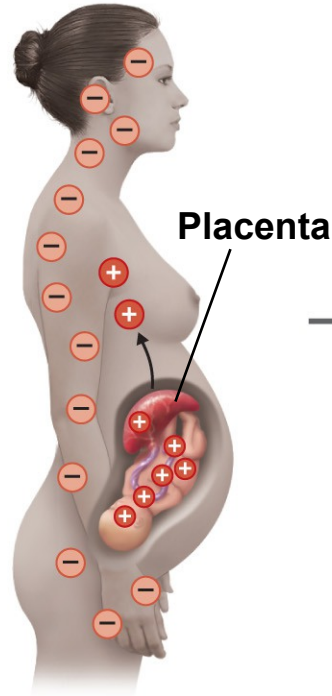
Type II - Drug-induced thrombocytopenic purpura.



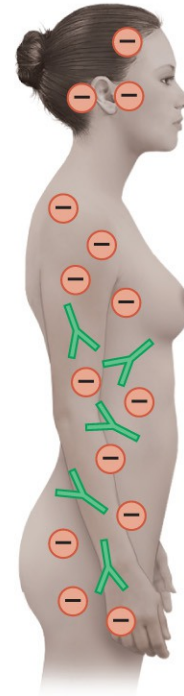
Type II - Hemolytic disease of the newborn.



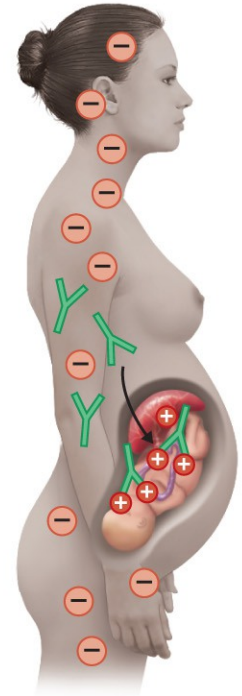
1 Rh⁺ father.



2 Rh⁻ mother carrying her first Rh⁺ fetus. Rh antigens from the developing fetus can enter the mother's blood during delivery.



3 In response to the fetal Rh antigens, the mother will produce anti-Rh antibodies.

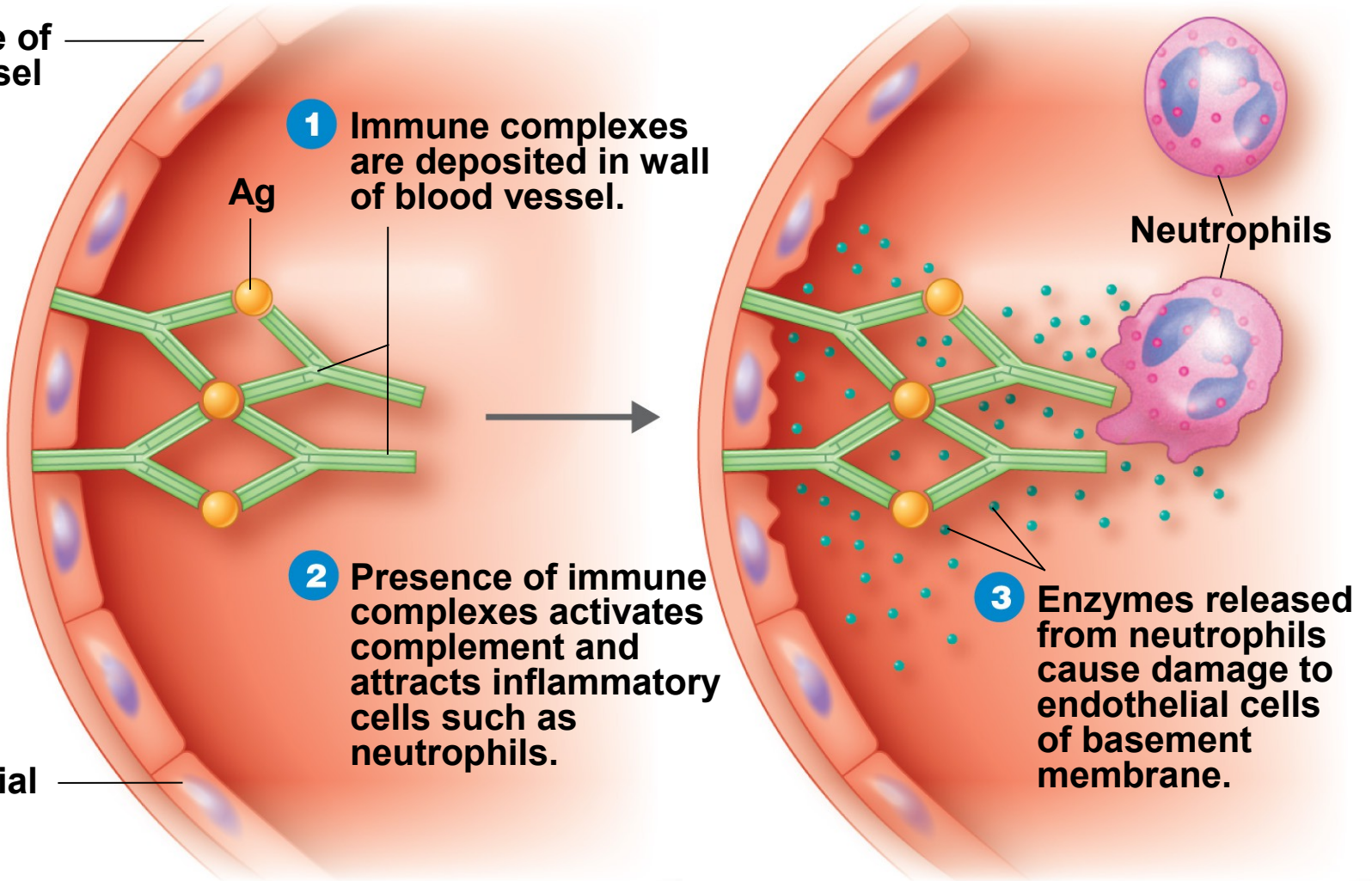


4 If the woman becomes pregnant with another Rh⁺ fetus, her anti-Rh antibodies will cross the placenta and damage fetal red blood cells.

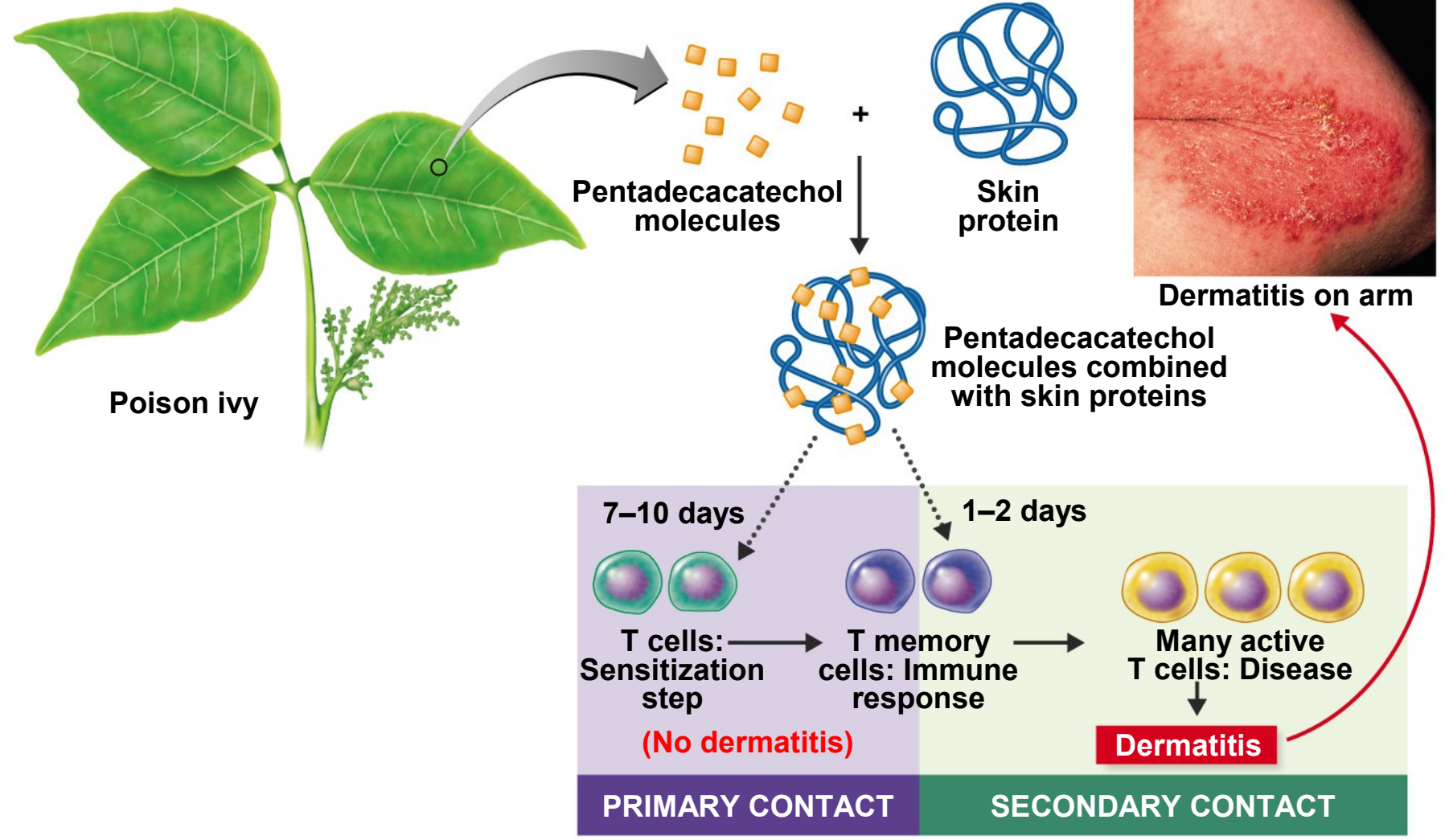
Type IV - Immune complex-mediated hypersensitivity.

Basement membrane of blood vessel

Endothelial cell



Type IV



The development of an allergy (allergic contact dermatitis) to catechols from the poison ivy plant.

Type IV – Allergic Contact Dermatitis

