

Hypersensitivity Type III and IV

Classification of Hypersensitivity

	Type	Mechanism	Example
Anaphylactic hypersensitivity	I	IgE mediated	Systemic anaphylaxis eg peanut allergy Asthma
Cytotoxic hypersensitivity	II	Antibody mediated	Haemolytic disease of the newborn
Immune complex hypersensitivity	III	Immune complex mediated	Arthus reaction Glomerular nephritis
Cell-mediated hypersensitivity	IV	Cell mediated (delayed)	Contact dermatitis

Type III Hypersensitivity

(Immune complex mediated)

- Caused by IgM or IgG Abs against soluble antigens.
- Ab/Ag immune complexes normally removed effectively.
- In these reactions complexes that persist are deposited in the circulation or tissue and cause inflammation.
- Frequent complication in autoimmune disease.

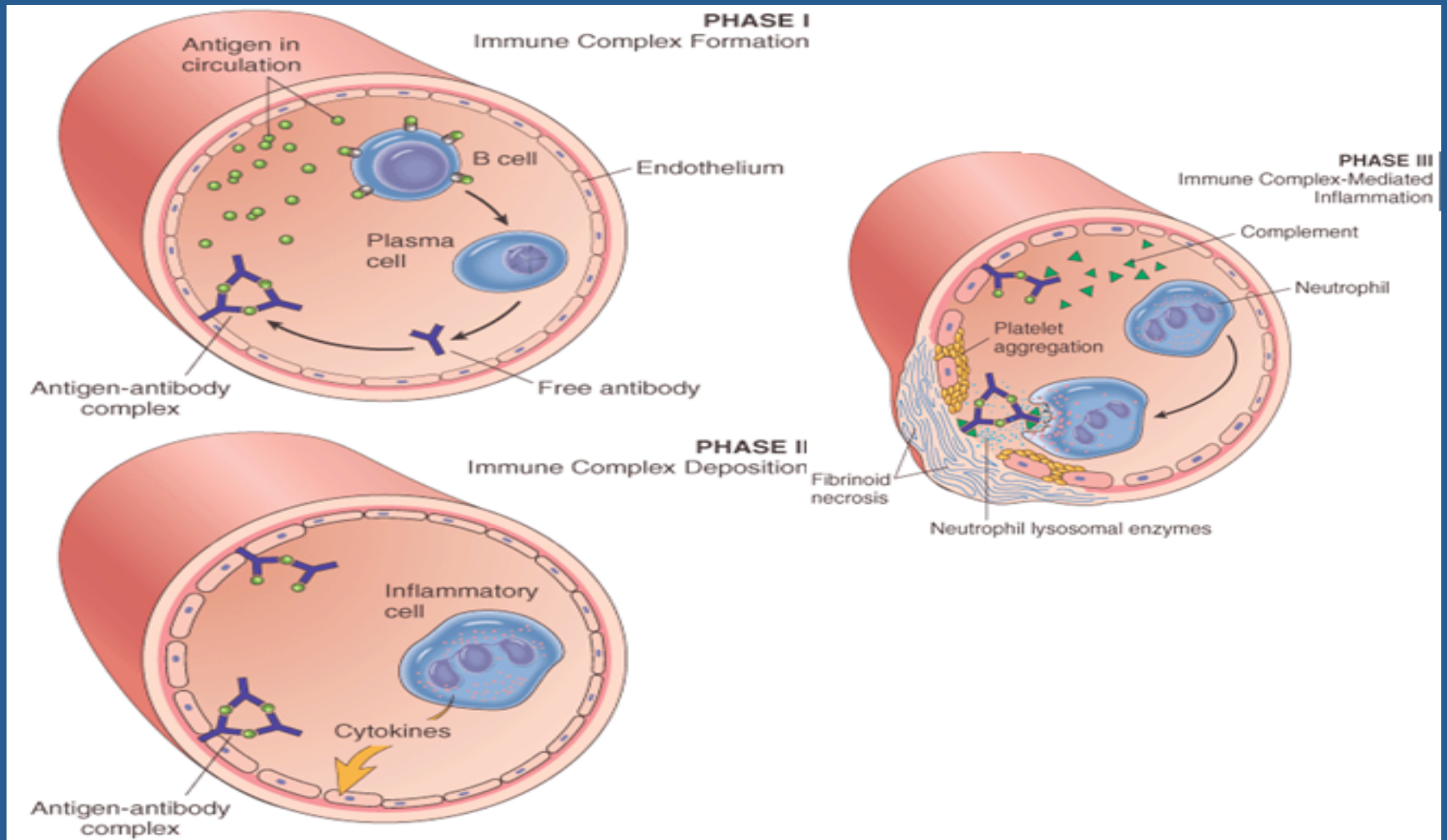
3 Basic Categories

Cause	1) Persistent Infection	2) Autoimmunity	3) Inhaled Antigen
Antigen	Microbial	Self-antigen	Mould plant or animal antigen
Site	Kidney and infected organs	Kidney, joints and skin	Lung

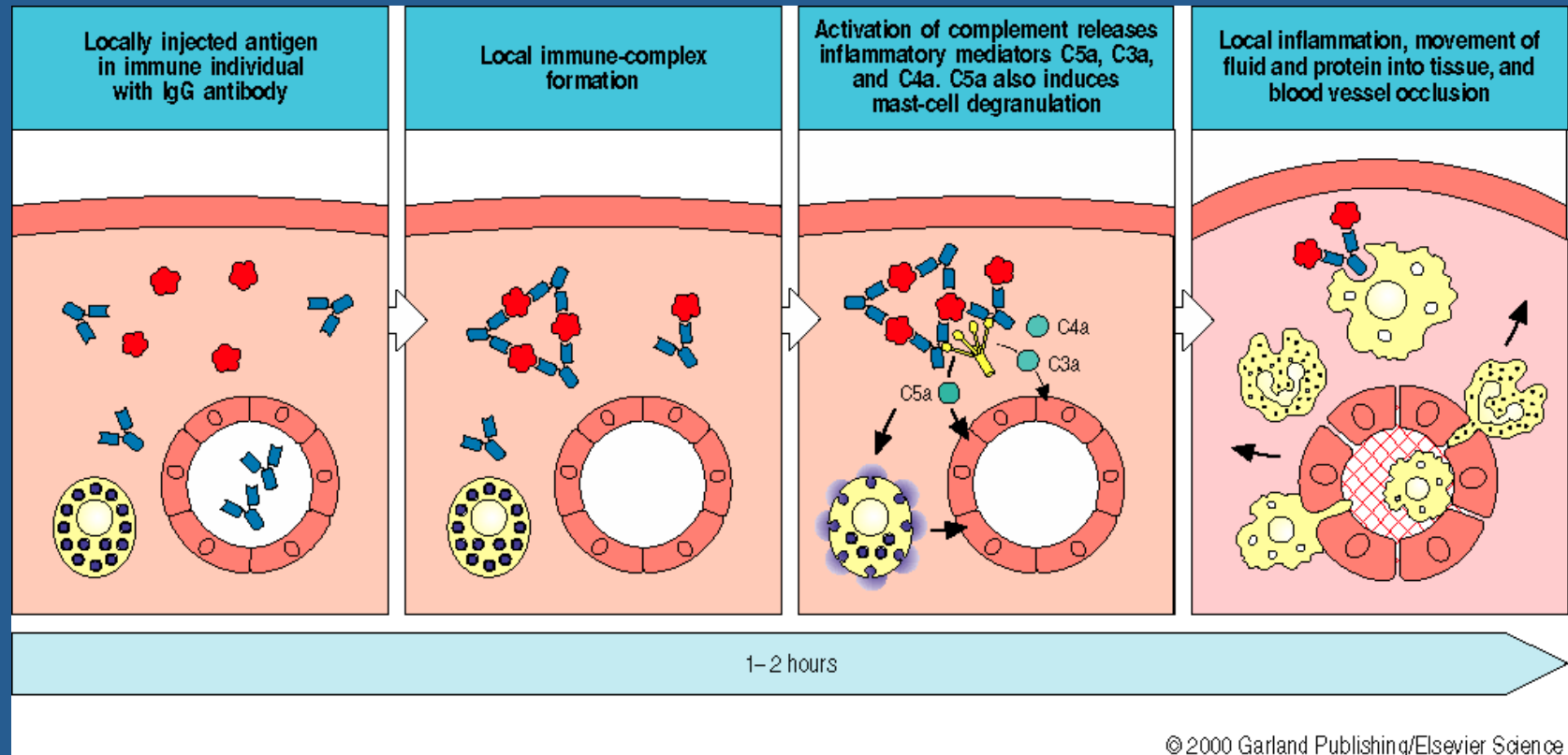
MECHANISMS IN TYPE III HYPERSENSITIVITY

- Complexes interact with basophils and platelets to induce release of vasoactive amines.
- Macrophage stimulation results in cytokine release (TNF α IL-1).
- Complement activation and inflammation.

MECHANISMS IN TYPE III HYPERSENSITIVITY



Experimentally induced Type III hypersensitivity

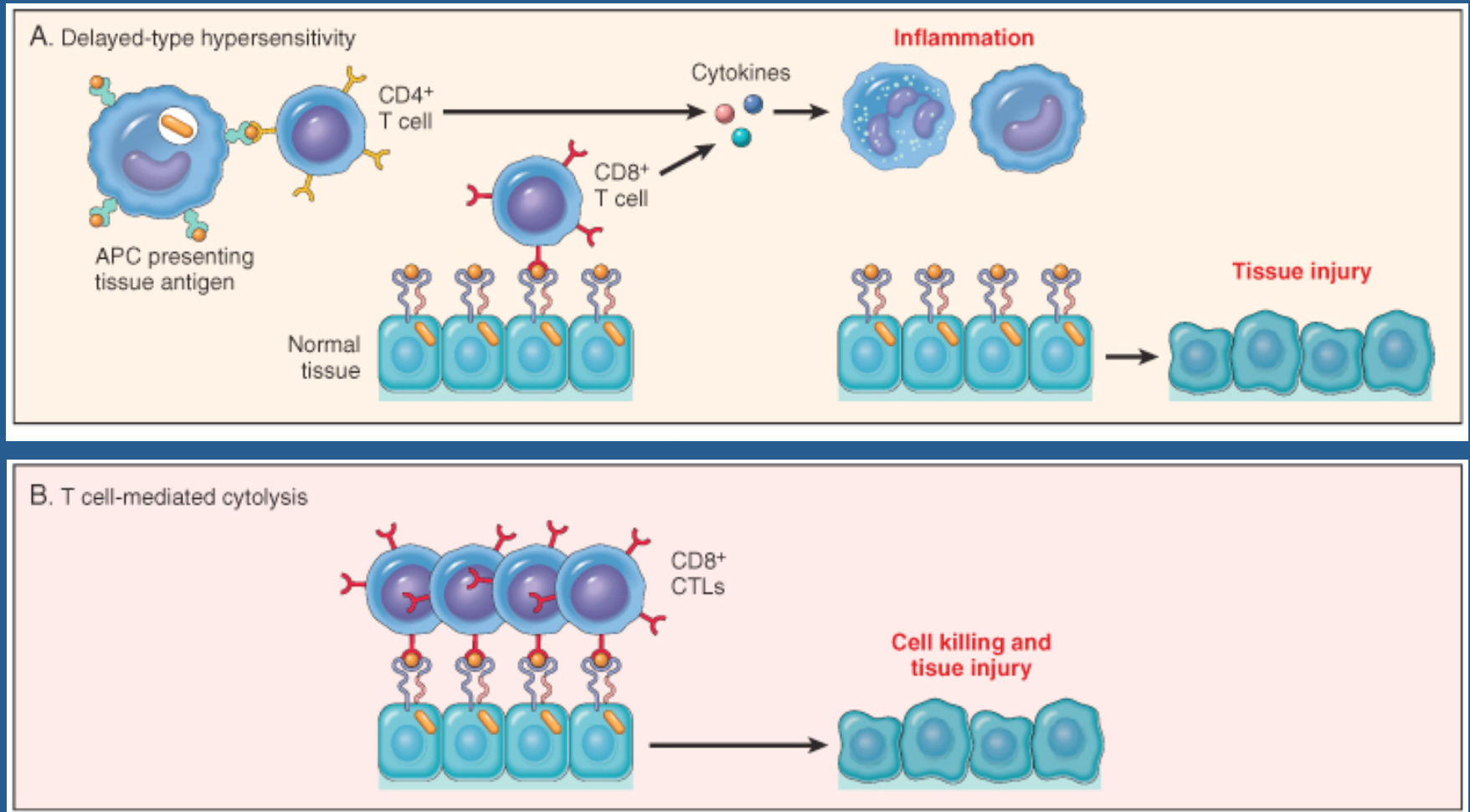


Immune complex deposition in the skin and resultant pathology is known as the Arthus reaction

TYPE IV Hypersensitivity

- Delayed type hypersensitivity (DTH)
- Typically mediated by T_H1 cells and/or macrophages which produce and respond to cytokines including $TNF\alpha$ and $IFN\gamma$
- Can be shown experimentally by transferring T cells between animals.

Delayed type hypersensitivity DTH



3 BASIC TYPES

- | | |
|-----------------------------|-------------|
| 1- Contact hypersensitivity | 48-72 hours |
| 2- Tuberculin reaction | 48-72 hours |
| 3- Granulomatous reaction | 21 days |

Contact hypersensitivity

Characterised by inflammatory reaction in the skin following contact with an allergen

