

Immunological Disorders

Autoimmune Disorders and Types

Definition of Autoimmune Disorders

- Autoimmune disorders are diseases in which the immune system attacks the body's own tissues.
- This occurs due to failure of self-tolerance mechanisms.
- The immune system treats self-antigens as foreign.

Basic Features of Autoimmune Disorders

- Presence of **autoantibodies** or autoreactive T cells
- Chronic inflammation
- Tissue and organ damage
- Often long-lasting (chronic diseases)

Causes and Predisposing Factors

1. Genetic Factors

- Certain genes can increase a person's susceptibility to autoimmune diseases.
- Some human leukocyte antigen, or **HLA**, types are associated with an increased risk of particular autoimmune disorders.

2. Environmental Factors

- Infections, chemicals, drugs, smoking, and other environmental exposures can contribute to autoimmune disease in genetically susceptible individuals.

3. Hormonal Factors

- Hormones can influence immune responses.
- Some autoimmune diseases occur more frequently in females than in males.

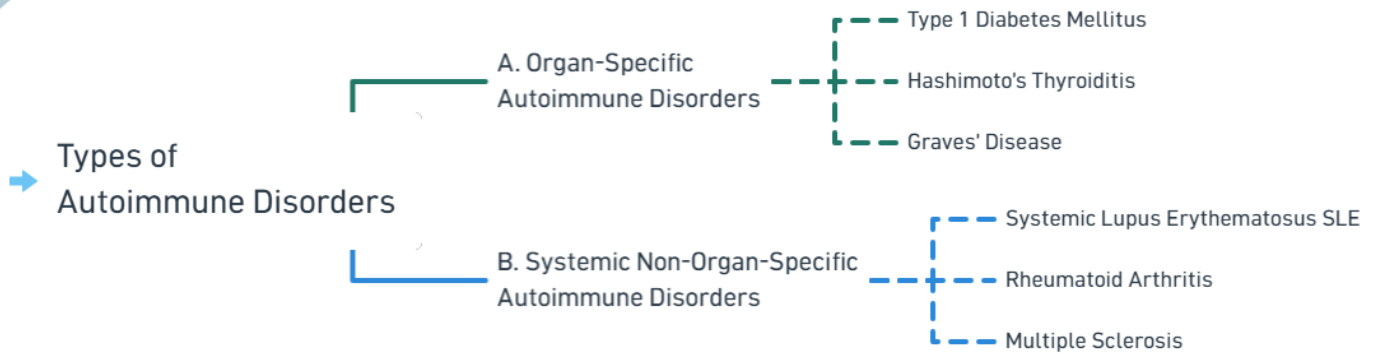
4. Infections

- Certain infections may trigger autoimmune reactions.
- Microbial antigens may sometimes resemble self-antigens and cause cross-reactive immune responses.

5. Failure of Immune Regulation

- Regulatory mechanisms normally control potentially self-reactive immune cells.
- Defects in these mechanisms can allow harmful autoimmune responses to develop.

Types of Autoimmune Disorders



A. Organ-Specific Autoimmune Disorders

- Affect a particular organ or tissue

➤ Examples:

1. Type 1 Diabetes Mellitus

- Destruction of pancreatic β -cells

2. Hashimoto's Thyroiditis

- Autoimmune destruction of thyroid gland

3. Graves' Disease

- Autoantibodies stimulate thyroid gland

B. Systemic (Non-Organ-Specific) Autoimmune Disorders

- Affect multiple organs or systems

➤ Examples:

1. Systemic Lupus Erythematosus (SLE)

- Autoantibodies against nuclear components

2. Rheumatoid Arthritis

- Chronic inflammation of joints

3. Multiple Sclerosis

- Immune attack on myelin sheath

Classification Based on Mechanism

- Antibody-mediated (Type II hypersensitivity)
- Immune complex-mediated (Type III hypersensitivity)
- T cell-mediated (Type IV hypersensitivity)

Factors Influencing Autoimmune Disorders

- Genetic predisposition (HLA genes)
- Environmental triggers (infections, drugs) & Hormonal influences

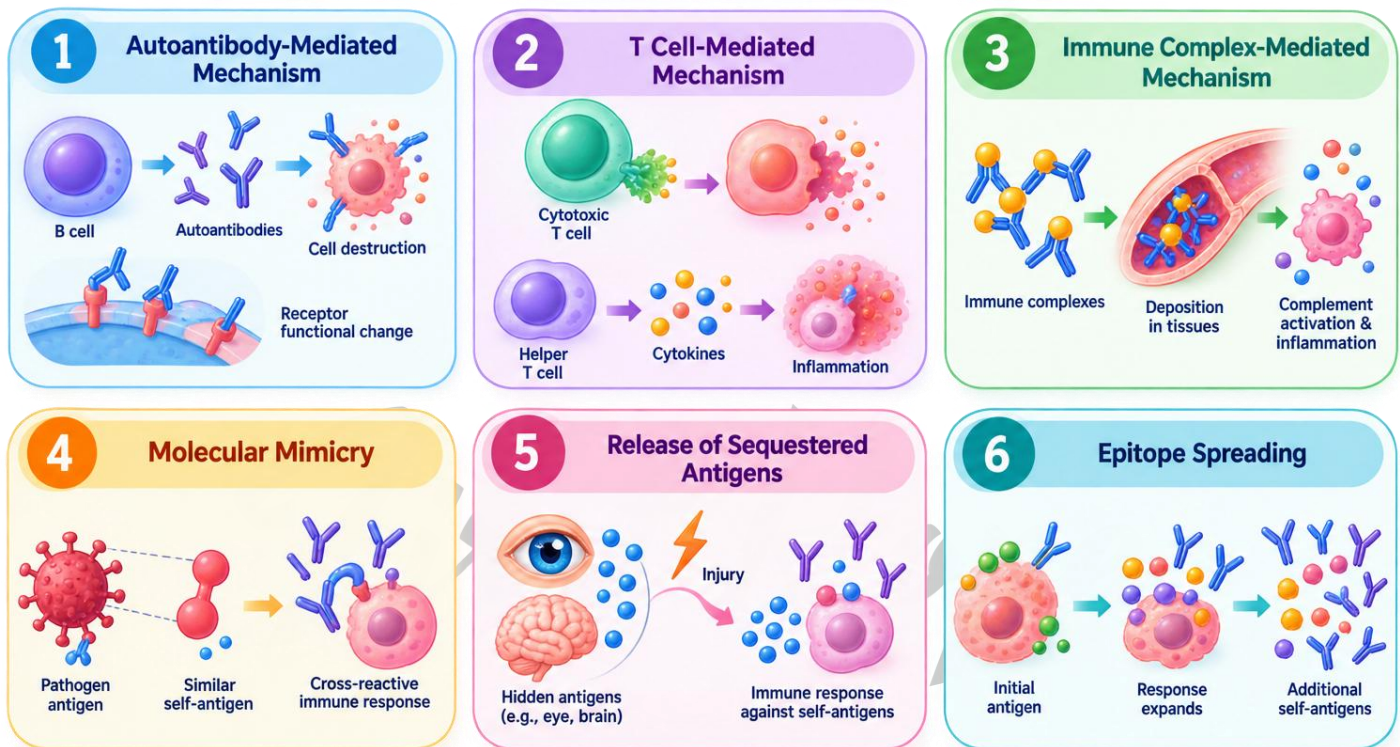
Pathogenic Mechanisms of Autoimmune Diseases

- Pathogenic mechanisms explain how autoimmune diseases **develop and cause tissue damage**.

Breakdown of Self-Tolerance

- Failure of central and peripheral tolerance
- Self-reactive lymphocytes escape deletion

Major Mechanisms of Autoimmunity



A. Autoantibody-Mediated Mechanism

- B cells produce **autoantibodies** against self-antigens
- **Effects:**
 - Cell destruction (Type II hypersensitivity)
 - Functional alteration of receptors

B. T Cell-Mediated Mechanism

- Cytotoxic T cells directly attack self-cells
- Helper T cells release cytokines causing inflammation
- Associated with: Type IV hypersensitivity

C. Immune Complex-Mediated Mechanism

- Formation of **antigen-antibody complexes**
- Deposition in tissues

➤ **Effects:**

- Activation of complement system
- Inflammation (Type III hypersensitivity)

D. Molecular Mimicry

- Pathogen antigens resemble self-antigens
- Immune response cross-reacts with self-tissues

E. Release of Sequestered Antigens

- Hidden antigens (e.g., in eye, brain) exposed after injury
- Immune system reacts against them

F. Epitope Spreading

- Immune response initially targets one antigen
- Gradually expands to attack additional self-antigens

Role of Genetic and Environmental Factors

- **Genetic predisposition:** Especially MHC (HLA) genes
- **Environmental triggers:** Infections, drugs, and other external factors

Outcomes of Pathogenic Mechanisms

- Chronic inflammation
- Tissue destruction
- Loss of normal organ function

Treatment of Autoimmune Diseases

- There is usually **no complete cure** for most autoimmune diseases.
- **Treatment focuses on:**
 - Reducing immune system activity
 - Controlling inflammation
 - Managing symptoms and preventing damage

Types of Treatment

1. Immunosuppressive Drugs

- Suppress overall immune response
- Used in moderate to severe conditions

➤ **Examples:**

- Azathioprine
- Methotrexate
- Cyclophosphamide

2. Corticosteroids

- Strong anti-inflammatory and immunosuppressive agents
- Provide rapid relief of symptoms
- **Examples:**
 - Prednisone
 - Dexamethasone
- **Note:** Long-term use may cause significant side effects

3. Biological Therapies (Biologics)

- Target specific immune molecules (more precise treatment)
- **Examples:**
 - Anti-TNF drugs (e.g., Infliximab)
 - Anti-IL-6 antibodies
 - Anti-CD20 antibodies

4. Non-Steroidal Anti-Inflammatory Drugs (NSAIDs)

- Reduce pain and inflammation
- Used mainly for symptomatic relief

5. Hormone Replacement Therapy

- Used when autoimmune damage affects endocrine glands
- **Examples:**
 - Insulin (Type 1 diabetes)
 - Thyroxine (thyroid disorders)

6. Plasmapheresis

- Removal of circulating autoantibodies from blood
- Used in severe or acute conditions

7. Stem Cell Therapy

- Helps reset or rebuild the immune system
- Used in selected severe cases



FREE PREVIEW

[Click here to visit our website](#)

PHARMACY PREMIUM NOTES

Complete subject
and semesters are
available on
FirstHope app only.



[Scan or click here](#)

Click here to get the app



Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram



[Scan or click here](#)

@FirstHopeNotes

Instagram

@firsthope.official

[Click here to follow >](#)

YouTube channel

FirstHope-Pharmacy / Live streams

[Click here to watch >](#)

WhatsApp channel

Follow FirstHope on WhatsApp

[Click here to join >](#)

FirstHope website

firsthopenotes.com

[Click here to visit >](#)

B.Pharm / D.Pharm / M.Pharm / Pharm.D

Preview notes. Complete subjects and semesters in the FirstHope app.