

INDEX

1. Immunity

• The Immune organ system.....	13
Innate Immunity.....	15-18
• Components.....	15
• Inflammasome.....	16
• Toll Like Receptors (TLRs).....	17
• Acute phase reactant proteins (APRs).....	17
Adaptive Immunity.....	19-21
• Components.....	19
• Local (or mucosal) Immunity.....	19
• Active Vs Passive Immunity.....	20
• Herd Immunity.....	21
• Adoptive Immunity.....	21

2. Major Histocompatibility Complex.....22-25

• MHC-I & MHC-II.....	22
• MHC-III.....	23
• HLA subtypes associated with diseases.....	24

3. Lymphocytes.....26-32

• T lymphocytes.....	26
• B lymphocytes.....	27
• T & B cell activation.....	28
• B cell activation and class switching.....	28
• Null cells / NK cells.....	30
• Phagocytic cells & APCs.....	31

4. Antigen & Antibody structure and function.....33-37

• Antibody structure and function.....	33
• IgG.....	35
• IgA.....	36
• IgM.....	36
• IgD.....	37
• IgE.....	37

•	Abnormal Immunoglobulins.....	38
•	Bence-Jones proteins	
•	Waldenstrom's Macroglobulinemia	
•	Heavy chain disease	
•	Cryoglobulinemia	
	Antigen type and memory.....	39-42
•	Haptens.....	39
•	Antibody affinity.....	40
•	Forssmann antigen.....	40
•	Epitope (Antigenic determinant).....	40
•	Antigen-antibody reaction curve.....	40
•	Reagin antibody.....	41
•	Heterophile antigens.....	41
•	Weil-Felix reaction.....	41
•	Paul-Bunnell test.....	41
•	Superantigen.....	42
5.	Complement system.....	43-44
6.	Cytokines	45-47
7.	Hypersensitivity.....	48-54
•	Type I.....	48
•	Type II.....	50
•	Type III.....	52
•	Type IV.....	53
8.	Blood transfusion reactions.....	55-56
•	Allergic/anaphylactic reaction.....	55
•	Febrile non-hemolytic transfusion reaction.....	55
•	Acute hemolytic transfusion reaction.....	56
•	Transfusion-related acute lung injury.....	56
9.	Antibody related disorders.....	57-58
10.	Immunodeficiencies.....	59

11. Autoimmunity.....60-61

12. Important diseases high-yield

- Acquired Immunodeficiency Syndrome (AIDS).....62
- Systemic Lupus Erythematosus (SLE).....65
- Grave's disease.....69
- Guillain-Barre70
- Hashimoto thyroiditis.....71
- Crohn disease.....72
- Multiple sclerosis.....74
- Myasthenia gravis.....76
- Lambert-Eaton myasthenic syndrome.....78
- Sjögren syndrome.....79
- Scleroderma.....82

13. B cell disorders.....84-86

- X-linked (Bruton) agammaglobulinemia.....84
- Selective IgA deficiency.....85
- Common variable immunodeficiency.....86

14. T cell disorders.....88-90

- DiGeorge syndrome.....88
- IL-12 receptor deficiency.....89
- Autosomal dominant hyper-IgE syndrome (Job syndrome).....89
- Chronic mucocutaneous candidiasis.....90

15. B & T cell disorders.....91-94

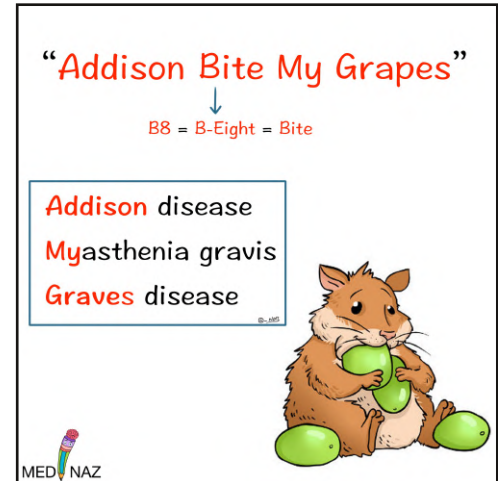
- Severe combined immunodeficiency.....91
- Ataxia-telangiectasia.....92
- Hyper-IgM syndrome.....93
- Nezelof syndrome.....93
- Wiskott-Aldrich syndrome.....94

16. Phagocyte dysfunction	95-97
• Leukocyte adhesion deficiency (type 1)	95
• Chédiak-Higashi syndrome.....	95
• Chronic granulomatous disease.....	97
• Tuftsin deficiency.....	97
• Shwachman’s disease.....	97
17. Grafts	98
18. Transplant rejection	98-100
• Hyper-acute.....	98
• Acute.....	99
• Chronic.....	100
19. Graft-versus-host disease (GVHD)	101
20. Immunosuppressant	102-104
21. Recombinant cytokines and clinical uses	105
22. Vaccination	106-109
23. Points to remember	110-112
24. Conceptual MCQs & Detailed Explanation	(Book II)
25. Practice Questions & Answers	(Book II)

HLA Sub types associated with diseases

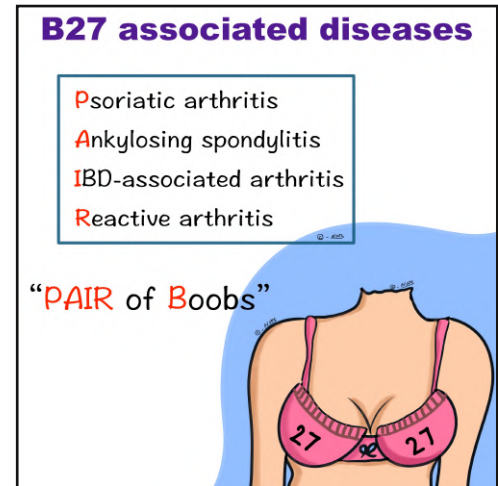
A3 - Hemochromatosis

B8 - Addison disease, myasthenia gravis,
Graves disease

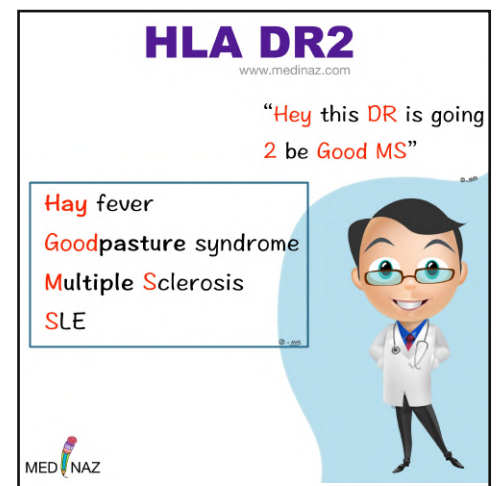


B27 - Psoriatic arthritis, Ankylosing spondylitis,
IBD-associated arthritis, Reactive arthritis

DQ2/DQ8 - Celiac disease



DR2 - Multiple sclerosis, hay fever,
SLE, Goodpasture syndrome



T & B - Lymphocytes

T - Lymphocytes :-

Origin - bone-marrow

Maturation - in Thymus

Peripheral blood - 70-80% of
total lymphocytes

CD markers - CD-3,4,8

Cell-mediated immunity

T & B Cell types

www.medinaz.com

T-cell types:

Helper

Memory

Cytotoxic

Suppressor

B-cell types:

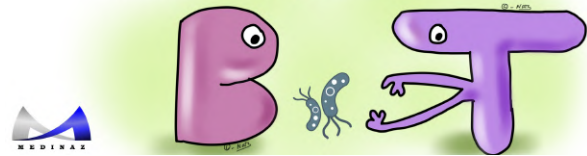
Memory cell

Plasma cell

When bacteria enter body,

T-cell says to B: "**Help Me Catch Some!**"

B-cell replies: "**My Pleasure!**"



CD4+ T cells help B cells make **antibodies** and produce **cytokines** to recruit phagocytes and activate other leukocytes

CD8+ T cells directly kill **virus-infected** cells

Regulatory T-cells (TREG) cells process surface markers such as CD4, CD25, and Foxp3



Key points

Deficiency of **Foxp3** receptors leads to a severe form of autoimmune disease known as Immune dysregulation Polyendocrinopathy, Enteropathy X-linked (**IPEX**) syndrome (Characterized by enteropathy, endocrinopathy, nail dystrophy, dermatitis, and/or other autoimmune dermatologic conditions. Associated with diabetes in male infants)

CYTOKINES

Secreted by **macrophages** - IL-1, IL-6, IL-8, IL-12, TNF-alpha,

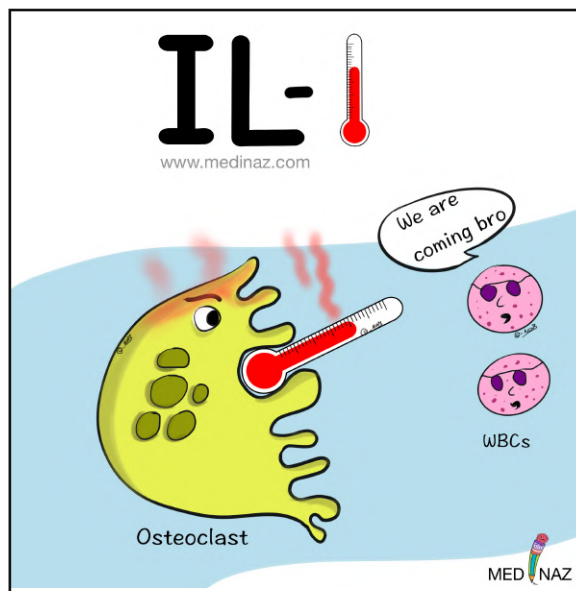
Secreted by all **T cells** - IL-2, IL-3,

From **Th1 cells** - Interferon gamma

From **Th2 cells** - IL-4, IL-5, IL-10

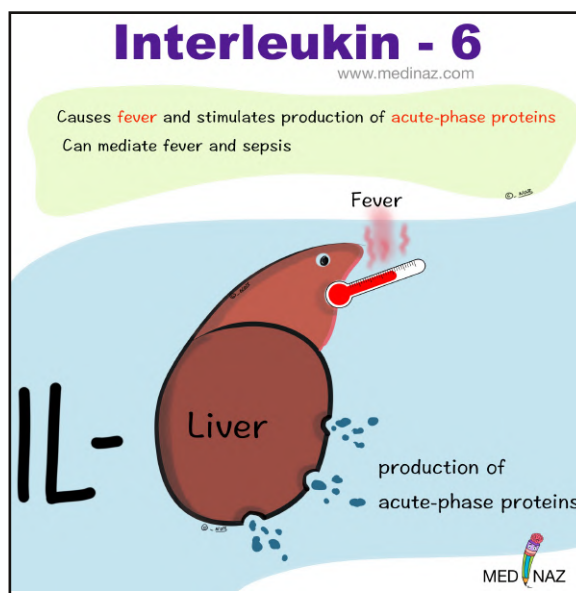
Interleukin-1

- Also known as **osteoclast-activating factor**
- Causes **fever**, **acute** inflammation
- Activates **endothelium** to express **adhesion molecules**.
- Induces **chemokine** secretion to recruit **WBCs**



Interleukin-6

- Causes fever and stimulates production of acute-phase proteins.
- Can mediate **fever** and **sepsis**



Interleukin-8

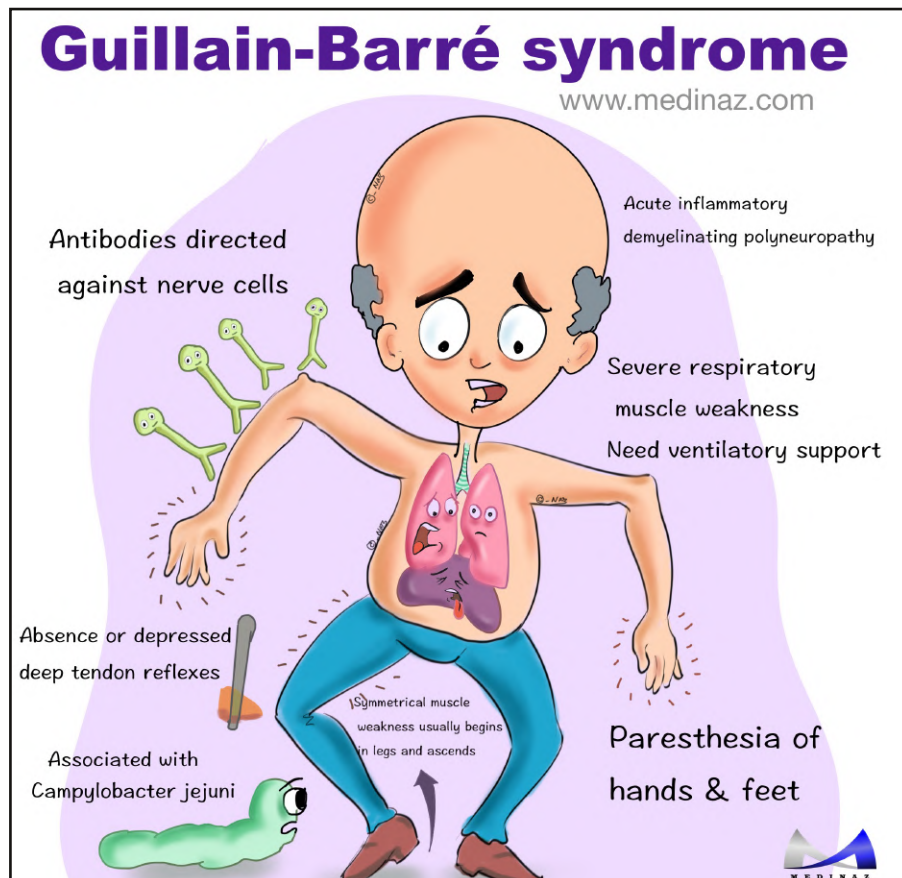
Major **chemotactic** factor for **neutrophils**.

Guillain-Barre Syndrome

Polyneuritis following viral infection/ autoimmune (**ascending** muscle weakness & paralysis; usually self-limiting)

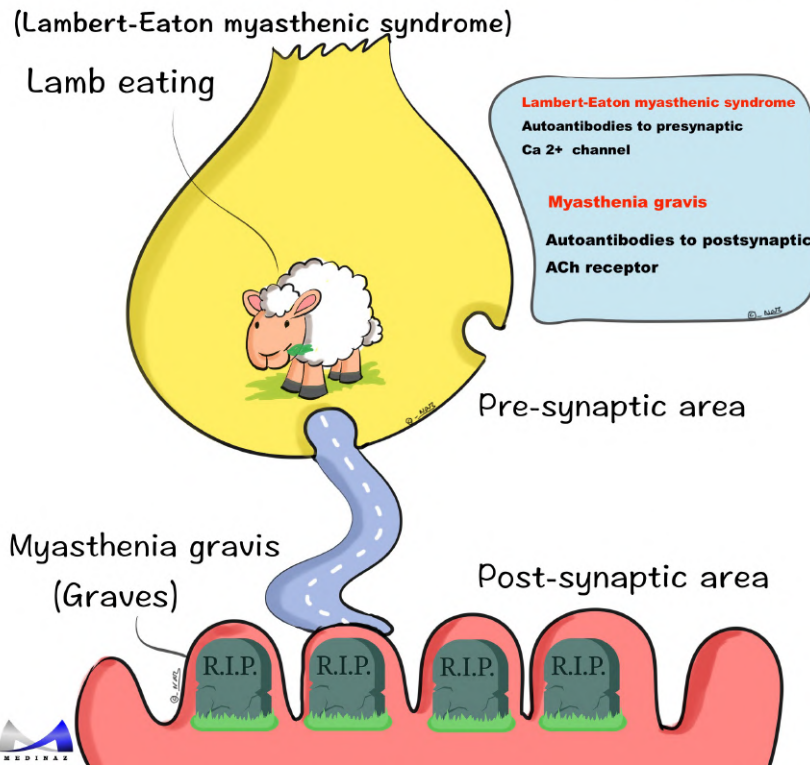
Associated with infections (eg, **Campylobacter jejuni**, viruses [eg, Zika]) that destroys **Schwann cells** by inflammation and demyelination of peripheral nerves

Facial paralysis (usually **bilateral**) and respiratory failure are common



Myasthenia Gravis Vs Lambert Eaton

www.medinaz.com



Associated with:

Thymic hyperplasia – 65%

Thymoma – 15%

Hyperthyroidism

Autoimmune disorders

(Hashimoto's thyroiditis, Grave's disease,
Rheumatoid arthritis, SLE etc)

HLA subtypes associated with MG – B8



Concept box

- Edrophonium to diagnose
- Pyridostigmine to treat (Mn. Pyridostigmine gets rid of myasthenia gravis)
- Most **sensitive** test - Single fibre electromyography
- Most **specific** test - Antibodies to ACh Receptors

Diagnosis:

Sjogren's syndrome Diagnosis

Ophthalmic tests

1. **Schirmer's test:** In normal patient **15mm** of filter paper is wetted when placed in lower conjunctival sac for **5 minutes**, but in SS only **5 mm**.



2. **Rose Bengal dye test:** Denuded and damaged areas of cornea can be visualised clearly with this dye.



3. **Break up time test:** A **slit lamp** is used and interval between complete blink and appearance of dry spot on the cornea is noted.



Salivary gland tests

1. Saliva flow rate is diminished in SS.



Extra Points

- **Anti-SSA** and **anti-SSB** may also be seen in SLE
- +Ve Anti-SSA in **pregnant women** with SLE – Increase risk of **congenital heart block** in the newborn.
- SS patients are at an increased risk of developing a **NHL**, most commonly mucosa-associated B-cell lymphomas (**MALT** lymphomas) involving the **salivary glands**