

HIGH-YIELD IMMUNOLOGY SYSTEM NOTES

FOR USMLE STEP 1 AND STEP 2

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Dear IMG

High-Yield Notes for USMLE Step 1 & Step 2 CK

IMMUNOGLOBULINS - HIGH-YIELD

- IgG → Most abundant in serum + ONLY crosses placenta + Secondary immune response + Opsonization
- IgM → FIRST produced in primary response + Pentamer (largest) + Best complement activator + ABO blood antibodies + Does NOT cross placenta
- IgA → Most abundant in SECRETIONS (saliva, tears, breast milk, gut) + Dimer + Prevents pathogen attachment
- IgA deficiency → Anaphylaxis with blood products → Use WASHED RBCs

Dear IMG

- IgE → Lowest serum concentration + Binds mast cells/basophils → Allergy + Anaphylaxis + ↑ in helminths
- IgD → B cell surface receptor on naive B cells (rarely tested)
- Primary response: IgM first → then IgG | Secondary response: Faster + Higher titer + Mostly IgG
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HLA DISEASE ASSOCIATIONS

- HLA-B27 → Ankylosing spondylitis + Reactive arthritis + Psoriatic arthritis + IBD arthritis (PAIR)

- HLA-DR3 + DR4 → Type 1 Diabetes mellitus
- HLA-DR2 → Multiple sclerosis + Narcolepsy + Goodpasture + SLE
- HLA-DR4 → Rheumatoid arthritis
- HLA-DQ2/DQ8 → Celiac disease
- HLA-B51 → Behcet disease
- HLA-B*5701 → Abacavir hypersensitivity → TEST before prescribing!
- HLA-A3 → Hemochromatosis
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LYMPHOCYTE MARKERS

- All T cells → CD3
- Helper T cells → CD4
- Cytotoxic T cells → CD8

- B cells → CD19, CD20, CD21 | Plasma cells → CD138
- NK cells → CD16, CD56 (NO CD3, NO TCR)
- Stem cells → CD34 | Macrophages → CD14
- Rituximab = Anti-CD20 | Basiliximab = Anti-CD25 | Muromonab = Anti-CD3
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KEY CYTOKINES

- IL-1 → Fever + Acute phase response → From Macrophages
- IL-2 → T cell proliferation (autocrine) → From T cells → Aldesleukin used in RCC + Melanoma

- IL-4 → IgE + IgG switching → From Th2
→ Allergy mediator → Blocked by Dupilumab
- IL-5 → Eosinophil growth → From Th2 →
↑ in asthma + parasites → Blocked by Mepolizumab
- IL-6 → Fever + CRP + Fibrinogen → From Macrophages → Blocked by Tocilizumab
- IL-8 → Neutrophil chemotaxis → From Macrophages
- IL-10 → Anti-inflammatory → From Tregs
- IL-12 → Activates NK cells + Th1 → From Macrophages/Dendritic cells
- IL-17 → Neutrophil recruitment → From Th17 → Blocked by Secukinumab

- IFN- α/β \rightarrow Antiviral \rightarrow From virally infected cells
- IFN- γ \rightarrow Macrophage activation \rightarrow From Th1 + NK cells
- TNF- α \rightarrow Fever + Cachexia + Septic shock \rightarrow From Macrophages \rightarrow Blocked by Infliximab/Adalimumab
- Fever cytokines = IL-1 + IL-6 + TNF- α |
Anti-inflammatory = IL-10 + TGF- β
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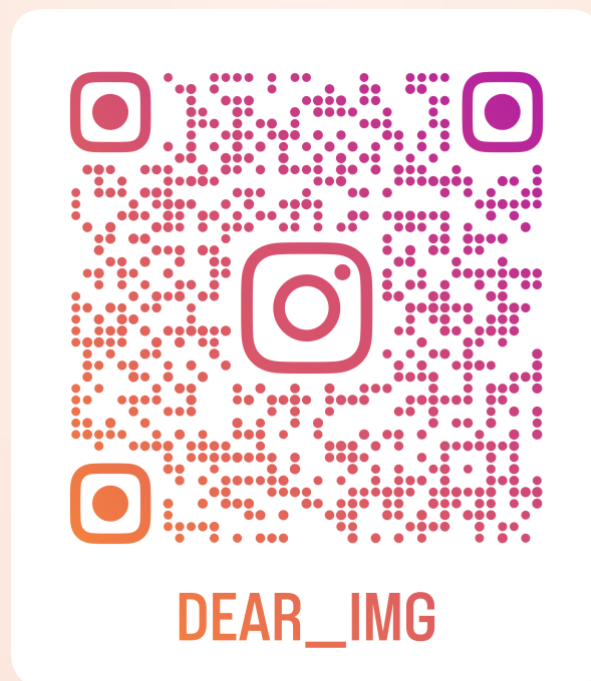
COMPLEMENT SYSTEM

- C3a + C5a = Anaphylatoxins \rightarrow Mast cell degranulation \rightarrow Histamine
- C5a = Best neutrophil chemotactic factor
- C3b = Opsonin \rightarrow Tags for phagocytosis



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