**Immuno Exam I – Recall Checklist**

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| CD4 | Th cells |
| CD8 | CTL |
| CD4+CD25+ | Regulatory TC |
| MHC I (on all body cells) | Presents antigen to CD8 |
| MHC II (on APCs only = macs, DC, B cells) | Presents antigen to CD4 |
| CD2, CD3 | On all T cells |
| IgA | Most prevalent but found mainly in mucosa |
| IgD | Ag receptor for naïve B cells |
| IgE | * Allergic reactions (activates mast cells) * Response to specific types of parasites |
| IgG | Most prevalent in serum – Opsonization, complement activation, transferred from mother to fetus. |
| IgM | First Ab isotype produced by naïve B cells |
| Idiotype | VH and VL chain portion = Ag specificity |
| Isotype | CH and CL regions = determines isotype (e.g. IgM) |
| Allotype | Genetic variability of individuals in CH regions |
| α and β TCRs | Lymphoid tissue |
| γ and δ TCRs | Mucosal surfaces (also non-protein Ag) |
| CD14 | Monocytes/macrophages |
| CD3 | All T cells |
| CD19, 20, 21 | B cells |
| TLR 4 | Detects LPS on Gram negative bacteria |
| T cells location in LN | Paracortex |
| B cells location in LN & splenic white pulp | Follicular region |
| Cytokines by macs when exposed to pathogen | TNF-α, IL-1, IL-6 |
| IL-8 | Neutrophil chemotactic |
| Type I IFN (α & β IFN) | Against virally infected cells |
| Type II IFN (IFNγ) | By NK cells 🡪 activates Macs |
| C1 | Classical pathway – Ag-Ab complex |
| C2 & C4 | 🡪 C4b2A complex = C3 convertase =Classical&Lectin |
| C3 & C5 | All three pathways Deficiency = fatal |
| C6-C9 | Forms MAC. Deficiency 🡪 recurrent *Neisseria* |
| C3a, C4a, C5a | Anaphylatoxin=activates mast cells. Effector chemotactic |
| Decay accelerating factor (DAF), Membrane cofactor protein (MCP) & C1 inhibitor (C1 INH) | Host cells regulatory proteins to prevent complement damage to self.  C1 INH deficiency 🡪 hereditary angio-neurotic edema |
| Factor B & D (alternative pathway) | Factor D cleaves B (bound to C3b) 🡪 C3 convertase |
| Properdin (Alternative pathway) | Stabilizes C3 convertase to bind C3b + factor B 🡪 C3bBb |
| CD16& CD56 | NK cell markers |
| Surfactant (lungs) | Opsonin |
| NLRP-3 (NOD-like receptor) | Senses PAMP & DAMP 🡪 ↑ IL-1 = pyrogen |
| NF-κB & IRF-3 | TLR transcription factors 🡪 downstream effects (eg IL1) |
| IL-1 & TNF-α | Inflammatory cytokine by macs to alarm neutrophils |
| IL-12 | Activates NK cells by Macs & DC |
| E & P selectins | ↓ affinity attachment proteins on endothelium(by TNF-α |
| Mac-1 & LFA-1 | ↑ affinity integrins on neutrophils. Deficiency 🡪 LAD |
| ICAM-1 & VCAM-1 | ↑ affinity integrins on endothelium |
| G-CSF (granulocyte colony stimulating factor) | 🡪 ↑ neutrophil production in BM |
| IL-4 & IL-13 | 🡪 activates M2 macs (alternative) = anti-inflammatory |
| IL-6 | Pyrogen by Macs |
| Chronic Granulomatous Disease (CGD) | Phagocyte NADPH oxidase mutation 🡪 recurrent catalase bacteria infections & forms granulomas |
| ITAM & ITIM | NK activating & inhibitory receptors for MHC-I recog. |
| FasL | NK ligand for Fas 🡪 induces apoptosis |
| NKG2D | NK receptor. Recognizes MHC-like molecule |
| CD16 | NK Ab receptor. Recognizes viral Ab on cell surface |
| IL-10 & TGFβ | Suppresses inflammation |
| IL-7 | T cell development growth factor |
| DiGeorge syndrome | Thymus development mutation 🡪 T cell deficiency |
| CCR7 | Receptor on DC & naïve TC. Binds CCL19 & CCL21 in T cell zone of LN (paracortex) |
| CXCR5 | On naïve B cells. Binds CXCL13 in follicular region= guide |
| S1P | Helps T cells leave LN |
| Immunogen | Substance (of Ag) that stimulates immune response |
| T-independent Ag | E.g. polysaccharide (can only BC) |
| T-dependent Ag | e.g. Protein also activates TC (CD4) |
| Hapten | Immunogen only when attached to carrier (protein). E.g. DNP or penicillin (can cause anemia when binds to RBC). |
| Adjuvants | Ennhances others immunogenicity but not immunogenic themselves. E.g. ALUM |
| Cross-reactivity | TC recognize similar/non-identical Ag.(Rheumatic fever) |
| MHC I domains | 3 α domains (ch. 6) & β2m (ch. 15) = 1 α chain attached to β2m (microglobulin) |
| MHC II domains | 2 chains = 2 α & 2β domains (ch. 6) |
| Autosomal MHC I deficiency | ↓ CD8 cells. Skin lesions |
| Bare lymphocyte syndrome | Deffective MHC II expression. Lethal. Treat: BMT |
| B7 (CD80 and CD86) binds CD28 | APC’s costimulator (e.g. DC) for naïve TC activation |
| HLA-DM | Removes CLIP in MHC II Ag processing (and replacing with Ag peptide for presentation to CD4). |
| TAP | Peptide (degraded by proteasome) transporter into ER in MHC I Ag processing |
| Tapasin | Anchors MHC I to TAP for peptides binding. |
| CDR | Hypervariable regions on Ab. Each chain = 3 CDRs.  - CDR3 = most variable. |
| Fab | Variable portion of H and L chain = binds Ag (*Pepsin* breaks down Fab further into single bivalent fragment) |
| Fc | Constant portion of H chain (separated from Fab portion by *Papain*) |
| Hinge region | Central part of Ig that links Fab and Fc. |
| Affinity | Strength of Ag/Ab binding. ↓ Kd = ↑ affinity |
| Avidity | Overall strength of Ag/Ab binding. Dependant on # of Ag/Ab binding sites. ↑ binding sites = ↑ avidity |
| SCID | T and B cells deficiency |
| CRP (C-reactive protein) | Acute phase protein by liver 🡨 IL-1, 6, TNFα. Coats microbes for macs. Also, triggers classical complement pathway. Part of innate immunity |