Lec 3

CD31, expressed on leukocytes and endothelial cells, for **adhesion → transmigration** of white blood cells (WBCs) through the endothelial wall at the site of injury (by **collagenase** enzymes which degrade the endothelial barrier, then WBCs will reach the site of injury by **chemotaxis** (moving toward **chemoattractans** :1. bacterial products (peptides) 2.chemokines 3.complement system (C5a) 4.LTB4 (by lipoxygenase AA)).

The type of inflammation is influenced by the leukocyte involved:

- **Acute Inflammation**: Characterized by neutrophils present for 6 to 24 hours.
- **Chronic Inflammation**: Occurs when macrophages, lymphocytes, and plasma cells dominate after 24 hours.
- **Allergic Reaction**: Involve eosinophils.

Upon reaching the site of injury, WBCs undergo **activation**, which involves 3 key steps:

1. **Recognition** and Attachment:(via mannose receptors and opsonins like IgG and C3b).
2. **Phagocytosis**: Engulfment of pathogens leads to the formation of phagosomes.
3. **Killing** and Degradation: achieved through :1. (**ROS**), such as (H2O2,iNO,MPO halide), 2. **granule enzymes** (in neutrophils and monocytes) → specially Neutrophils contain:(1).Primary (azurophilic) granules contain MPO enzyme (2). Secondary granule contain lysozyme , these enzymes inhibited by antiproteases (like ä1antitrypsen which inhibit elastase)3. **NETs** (meshwork of chromatin and anti microbial agents thats realesed after neutropil die) to immobilize microbes also it is involved is (Sepsis,SLE)deseases.

- After activation ,WBCs perform additional functions, including: 1. amplifying or limiting the inflammatory response (via cytokine release), 2. repairing tissue via (growth factor secretion), 3. T lymphocytes contributing to acute inflammation (through IL-17 production.)

However, white blood cells can also lead to tissue damage under certain conditions:

1. Prolonged Inflammation: (Seen in infections like tuberculosis or hepatitis C).
2. Inappropriate Response: Observed in (autoimmune diseases).
3. Exaggerated Response: like (allergy and asthma).

- There are 3 types of NO: (i,n,eNO), particularly the inducible form (iNOS), is produced in response to cytokines like IFN-γ and contributes to the immune response by reacting with superoxide (O2*) → form peroxynitrite (ONOO).