

2. Innate Immunity I

LEARNING OBJECTIVES:

1. Become familiar with the molecular events involved in leukocyte migration and diapedesis.
2. Be able to describe the major cellular receptors important in phagocyte function.
3. Understand the distinctions between opsonic and non-opsonic phagocytosis.
4. Get acquainted with the complement system, its components and pathways.
5. Be able to detail the major killing mechanisms brought to bear by phagocytes on their targets.
6. Appreciate the importance of phagocytosis outside the role of fighting pathogens

SUMMARY

1. Innate immunity represents the first-line of host defense. Its receptors are germline-encoded and recognize pathogen-associated “molecular patterns.”
2. Phagocytosis is a component of innate and acquired immunity. It is the principal means of destroying pathogenic bacteria and fungi. Phagocytosis initiates the process of antigen presentation.
3. Many phagocytic receptors recognize a diverse array of microbial pathogens. Some pathogens (e.g., *S. pneumoniae*) require opsonization by antibodies and complement for their clearance. However, bugs fight back.
4. Phagocytic leukocytes employ oxidative and non-oxidative means of killing. The NADPH oxidase generates reactive oxidants, such as superoxide anion and hypochlorous acid (bleach).
5. Innate immunity ushers in acquired immunity: innate immune activation of APCs results in up-regulation of co-stimulatory molecules and enhances the effectiveness of antigen presentation.
6. Phagocytosis is an essential component of development and tissue remodelling. Ingestion of apoptotic bodies is immunologically “silent” and is normally accompanied by a suppression of inflammation. Failure of this mechanism may result in autoimmunity.