**Our First Lines of Defense**

**“The Barriers”**

1. **Skin**
   1. Many layers
   2. Cells are full of tough keratin protein
   3. Normal skin secretions (oil and sweat) are acidic (ph 4 to 5.5) which inhibits growth of bacteria and fungi.
   4. Sweat also contains enzymes that kill bacteria
2. **Mucous Membranes**
   1. Cover all the openings leading into our body (mouth, eyes, ears, nose, respiratory tract, digestive tract, urinary tract, reproductive tract).
   2. Many layers, but no keratin.
   3. Saliva and tears contain lysozyme, an enzyme that kills bacteria.
   4. Mucus traps many microorganisms that try to enter the respiratory tract.
   5. Respiratory tract mucous membranes are covered with cilia that sweep mucus containing dust, pollution, and microorganisms up to the mouth where it is swallowed or spit out.
   6. The stomach produces very strong acid (pH 2) and digestive enzymes which together digest and destroy most microorganisms.
   7. Mucous membrane secretions also often contain antibodies.