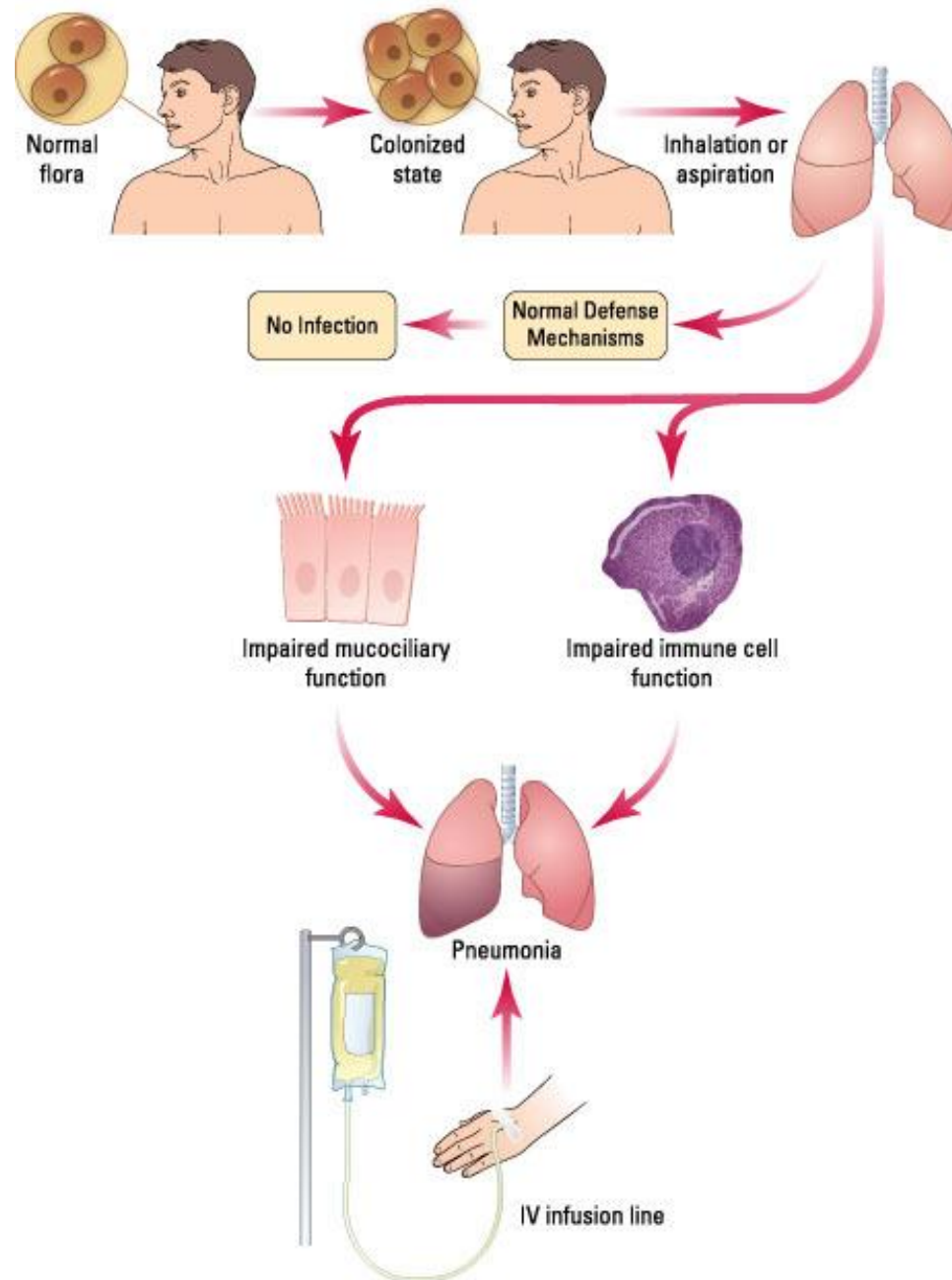


# Pathogenesis of Bacterial Infection The Infectious Process

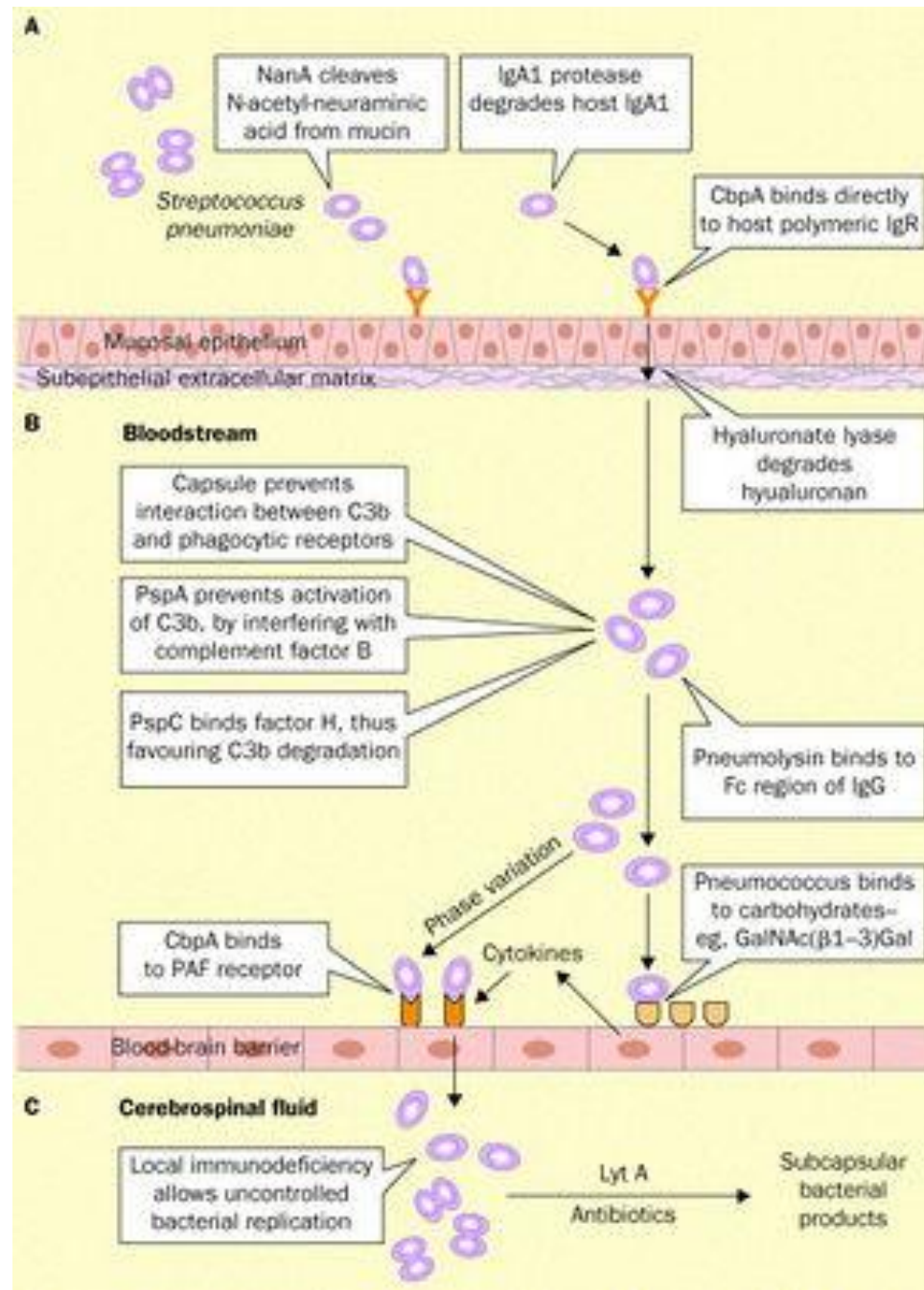
Dr. Ahmed Hasan

- Once in the body, bacteria must attach or adhere to host cells, usually epithelial cells. After the bacteria have established a primary site of infection, they multiply and spread directly through tissues or via the lymphatic system to the bloodstream. This infection (bacteremia) can be transient or persistent. Bacteremia allows bacteria to spread widely in the body and permits them to reach tissues particularly suitable for their multiplication.

# Pneumonia



# Pneumococcal Meningitis



# Cholera



# Bacterial Virulence Factors

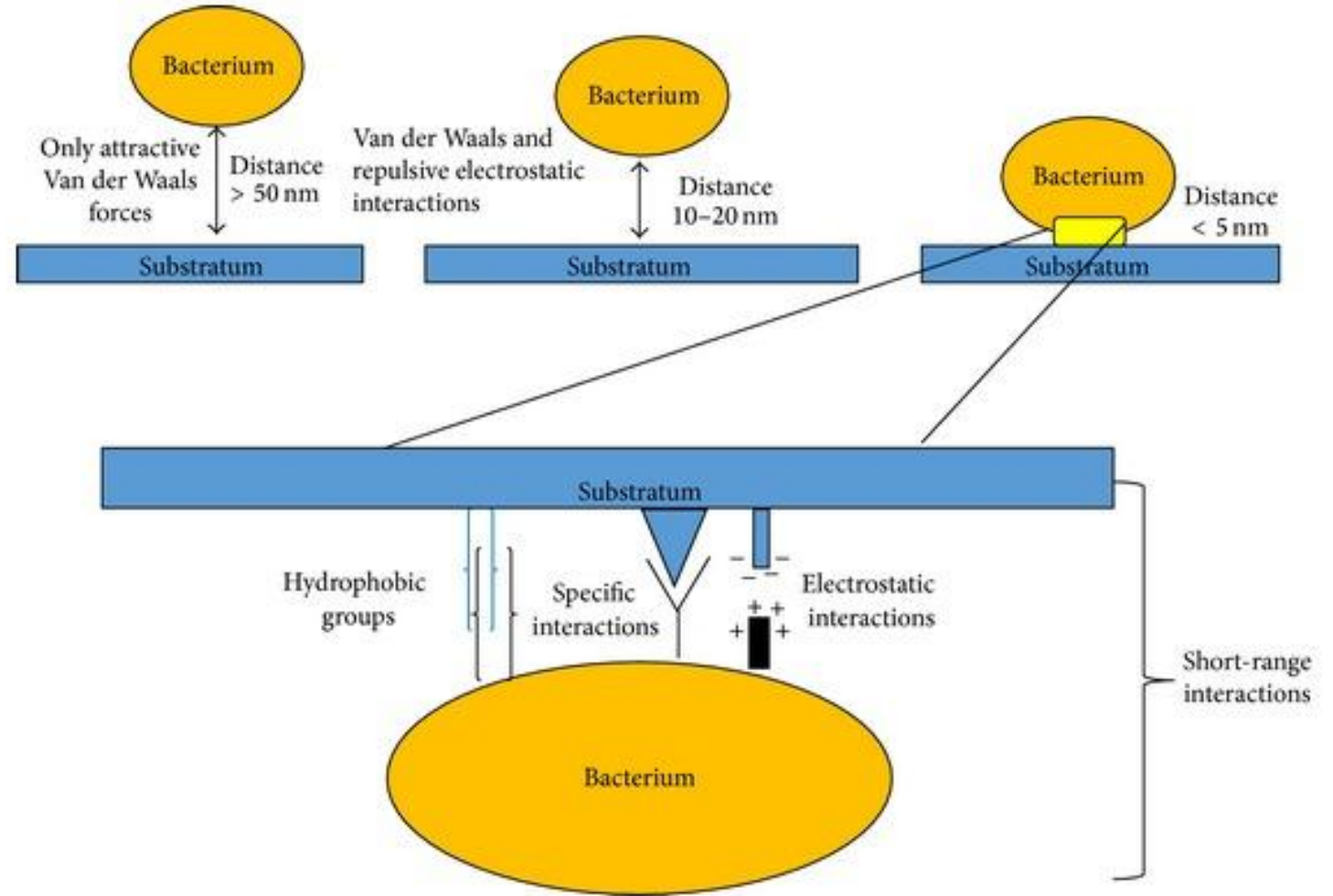
## Adherence Factors

- Once bacteria enter the body of the host, they must adhere to cells of a tissue surface. If they did not adhere, they would be swept away by mucus and other fluids that bathe the tissue surface. Adherence, which is only one step in the infectious process, is followed by development of microcolonies and subsequent steps in the pathogenesis of infection.

## Adherence Factors

- Bacteria and host cells commonly have net negative surface charges and, therefore, repulsive electrostatic forces. These forces are overcome by hydrophobic and other more specific interactions between bacteria and host cells. In general, the more hydrophobic the bacterial cell surface, the greater the adherence to the host cell. Different strains of bacteria within a species may vary widely in their hydrophobic surface properties and ability to adhere to host cells.

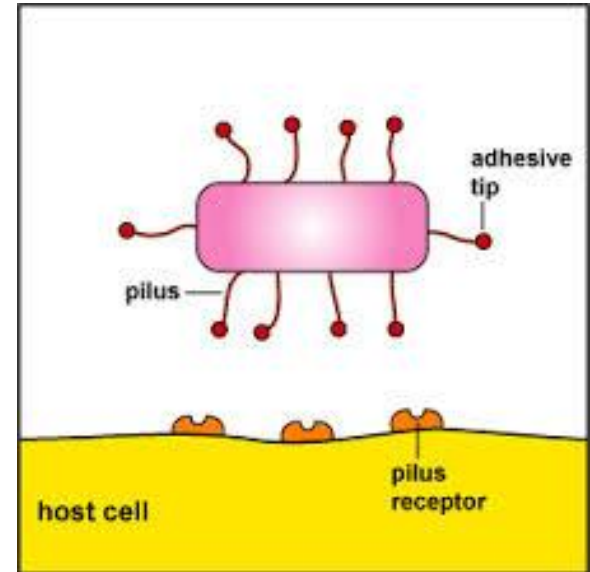
# Initial adherence





# Pili

- Bacteria also have specific surface molecules that interact with host cells. Many bacteria have **pili**, hair-like appendages that extend from the bacterial cell surface and help mediate adherence of the bacteria to host cell surfaces.



# fimbriae

- Group A streptococci (*Streptococcus pyogenes*) also have hair-like appendages, termed fimbriae, that extend from the cell surface. **Lipoteichoic acid**, protein F, and M protein are found on the fimbriae.

