

- **Disease** occurs when the host shows signs and symptoms caused by the pathogen
- Pathogens cause disease by damaging the cells of the host and by producing toxins

For an infection to take hold and cause disease, an organism must:

- attach itself to host tissues
- penetrate host cells
- colonise and reproduce within the host tissue

- In order to gain entry, the pathogenic organism needs to bind or adhere to the host.
- There are molecules called **ligands** found in the bacterial cell walls and outer viral coat, which bind to receptor molecules in host cell's membrane.
- Each ligand can bind to a specific receptor e.g. *streptococcus aureus* can bind to the cells lining of the throat.
- This is called **HOST SPECIFICITY** and the process of attachment is called **SPECIFIC ADHERENCE**.
- The ligand is composed of polysaccharides and are genetically controlled.
- The glycocalyx also helps bacteria to adhere to host cells.
- The host cell receptors contain proteins and the genes for these receptors vary, so some people are more susceptible than others.
- The pathogen enters host cells by **ENDOCYTOSIS** (an infolding of the cell membrane) or by producing enzymes which damage cell membranes.
- They invade phagocytes by the **mucilaginous capsule**, and when they enter the cell, they cannot be attached by further phagocytes.
- The bacteria can start reproducing and this is called **COLONISATION**.

Infection by a pathogen

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