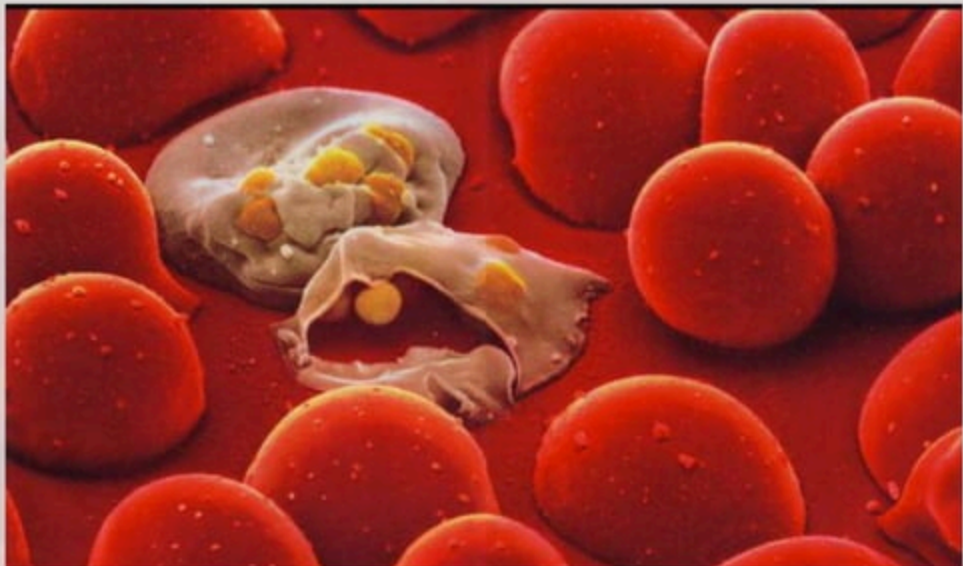


# *HOST PARASITE RELATIONSHIP*



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# Host Parasite Relationship

## Introduction-

- *the relationship between two organism can be very complex.*
- *The normal flora present in its normal site in human body provides some benefits to the host they live in the perfect symbiosis in their natural habitate.*
- *The host parasite relationship is two types –*
  - 1) *Beneficial*
  - 2) *harmful*

# Simbiosis

*Simbiosis is define as "life together". i.e. that two organisms live in an association with one another.*



# Types of Simbiosis

- **Commensalism**- parasite  
*Driving nourishment to the host without causing any harm or benefit to the host.*
- **Parasitism**- the relationship may be in which one organism damage the other.
- **Mutalism**- Both members of association benefit.



## **Some important terms**

### **Host-**

*Host are the large animal and plant organism on or in which a parasite can live.*

## Parasite

- *lives on or within a host organism.*
- *They cause disease in the host.*

### Parasitism

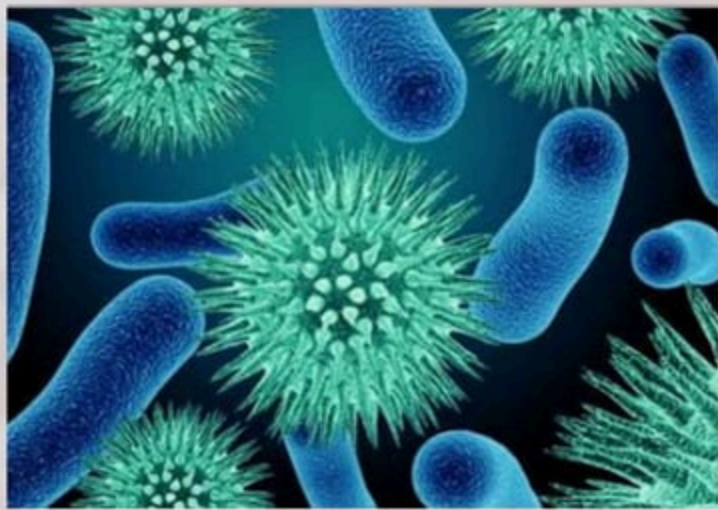


# Pathogen

*Pathogen is a microorganism is able to produce disease.*

# Pathogenicity

*It is the ability of a microorganism to cause disease in another organism.*





## **Resservoir**

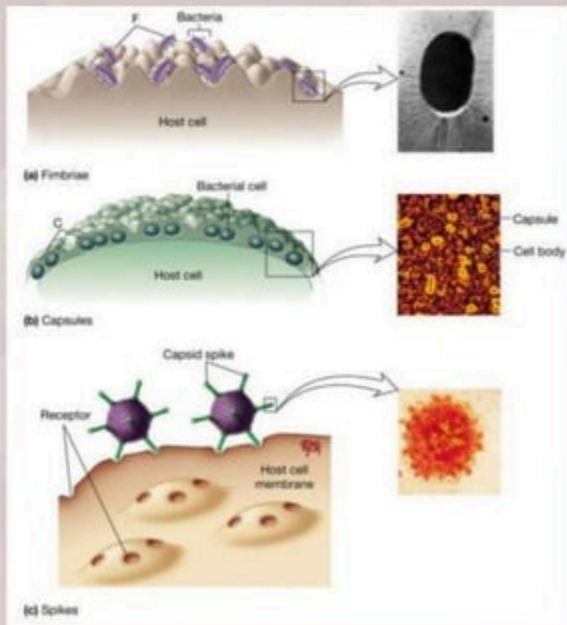
- Any person, plant, soil and substance in which an infectious agent normally lives and multiplies.

## **virulence**

- *Degree of pathogenicity of microorganism agent to cause disease.*
  - *It involves adherence, invasion and toxigenicity.*

# Adherence

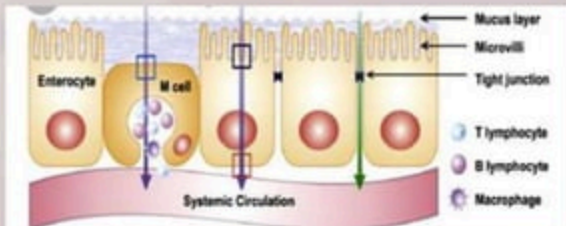
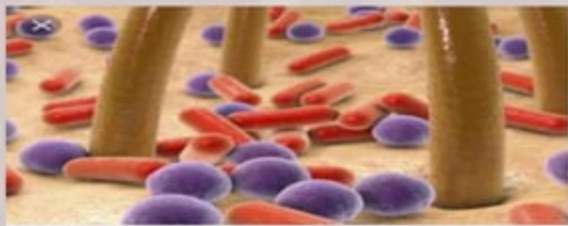
- The process by which bacteria stick to the surface of host cell.
- a) *Fimbriae / pili* (hair like structure) of bacteria.
- b) *Capsule* (sticky polysaccharide material) of bacteria.
- c) *Capsid spikes* of viruses.



# Invasion

*process by which bacteria, parasite enter into the host cell and spread in the body.*

*There are many barriers present on host by the breaking of these barriers the parasite enters into the host cell. Eg.- skin / mucous membrane.*



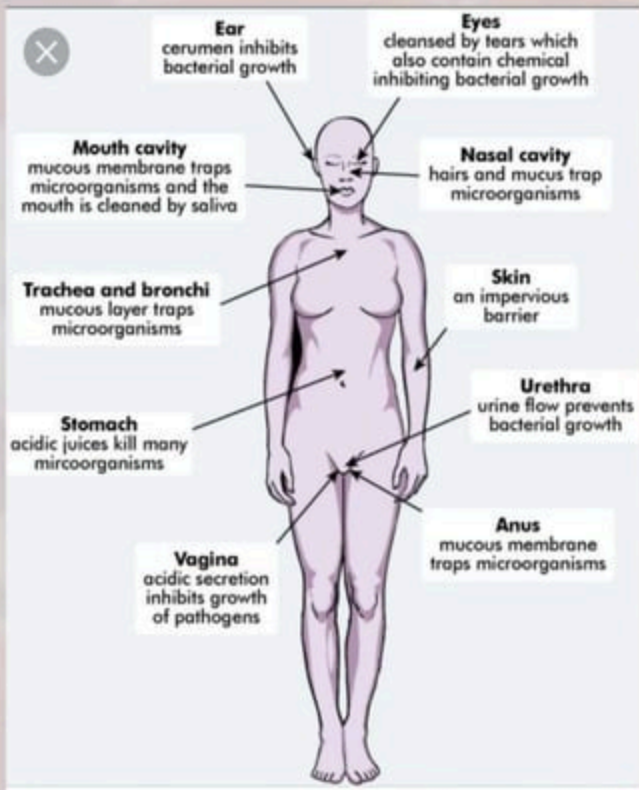
# Toxigenecity

*The ability of microorganism to produce toxins.*



# Normal flora

- *The body of a healthy individual is inhabited by many different microorganism.*
- *Normal flora is acquired after birth from food and environment.*
- *They occupy site.*
- *i.e. Skin, Mouth, Respiratory tract, Intestinal tract and genitourinary tract.*



# **Entry of microorganism into the host**

- *There are several sites for the entry of Microorganism.*

1) *Skin / Mucous membrane*

2) *Nose*

3) *Eyes*

4) *Mouth cavity*

5) *Respiratory tract*

6) *Intestinal tract*

7) *Genitourinary tract*

# Skin / Mucous membrane

- **Skin** – It consist of two parts.

## 1) **Epidermis** –

- It is acidic.
- Microorganism attached with this layer removed by washing.

## 2) **Dermis** –

- It contains hair follicle, sweat glands, sebaceous glands secrete sebum.
- It maintain pH(3-5) it restrict the entry of microorganism.
- The microflora consist Staphylococcus epidermidis, Propionibacterium acne .
- Under certain condition, S. epidermidis can penetrate skin, sometimes it leads to life threatening bloodstream infection.





## **Mucous Membrane**

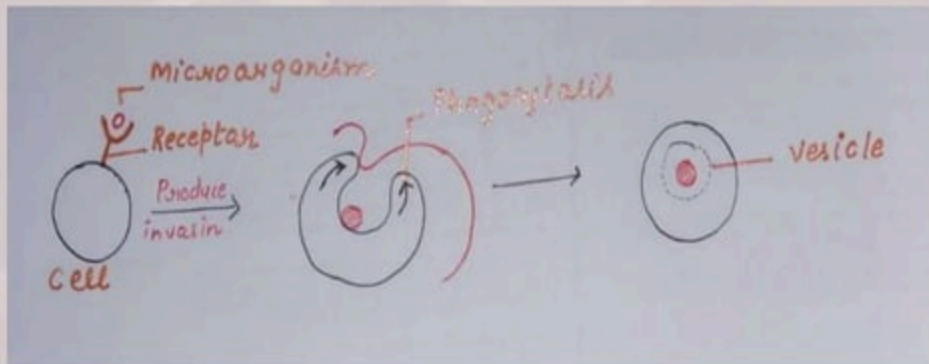
*Mucous membrane of respiratory tract, intestinal tract and genitourinary tract are barrier to microbial invasion.*

*There are two strategy for that i.e.*

- a) Direct uptake*
- b) Antigen sampling exploitation process*

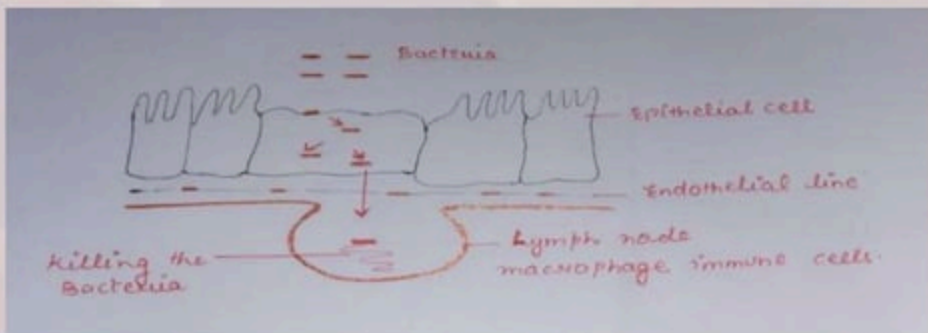
# Direct uptake

- Microorganism attached with cell receptor.
- Secrete invasin enzyme, degrade cell membrane and enter into the cell.
- After entry the vesicle of microorganism attached with lysosome.
- Lysosome degrade the microorganism and release the debris by the process of exocytosis.
- If it is not degraded they may cause disease.



# Antigen sampling exploitation process

- Bacteria enter into the cell by the M cell of the epithelial cell.
- these bacteria carrying into the lymph node, present just below the endothelial cell of intestine.
- in lymph node many macrophage and immune cells are present which engulf that foreign material.



## Eyes

The eyes are moistened continuously with tears , which contain an enzyme lysozyme which helps in the limiting bacteria.

# Mouth Cavity

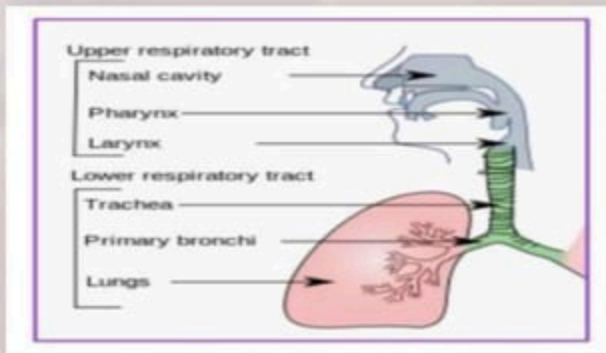
## NORMAL MICROBIAL FLORA OF GIT

- ORAL CAVITY
  - Sterile at birth
  - 4-12 hrs-Colonize by **viridans Streptococci** (Main bacteria)
  - Aerobic & Anaerobic *Staphylococci*
  - Gram Negative diplococci (*Neisseria*, *Moraxella*)
  - *Diphtheriods*, *Lactobacilli*
  - Adult- **Anaerobic Spirochaetes**, *Prevotella* spp,
  - **Actinomycese**
  - Yeast (*Candida*)



# Respiratory tract

- A mucociliary blanket cover much of the respiratory tract and trap foreign pathogen agent.
- blanket contain lysozyme and cilia which trap and expels out the microorganism with the help of ciliary movement.
- **Infection occurs** – Disturbance and removal of the mucociliary blanket by prior condition cause bronchitis and viral influenza.

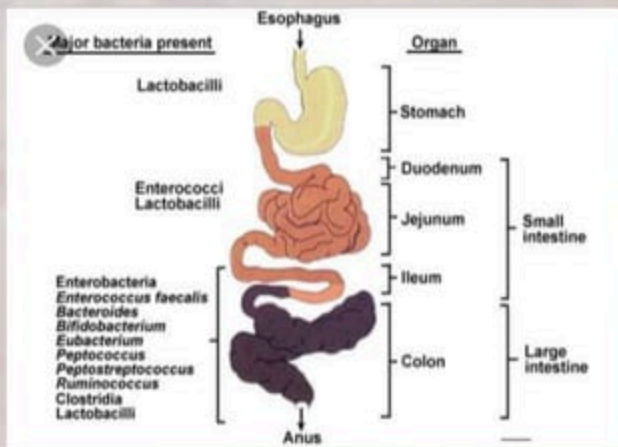


## **NOSE**

*Microflora of nose consist of gram positive cocci found on skin. It is an important site of Stephylococcus aureus residence.*

# Intestinal tract

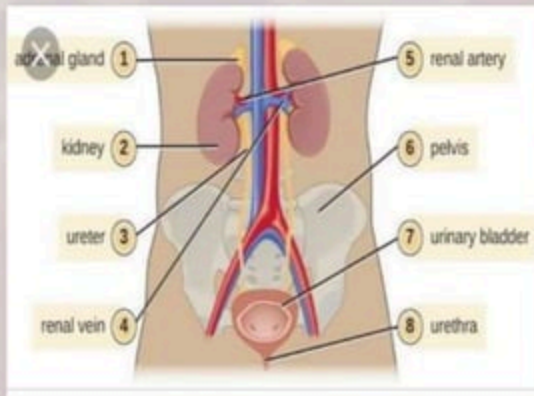
- Infected by contaminated food and water.
- In human adults gastric juice is highly acidic (pH1-2).
- Mucin layer cover and protect the lining of stomach from acidic pH.
- In stomach Helicobacter pylori present in human adults.
- **Infection occurs** – If pathogen can resist host defence.





# Genitourinary tract

- Kidney and bladder is sterile, may become contaminated with the microbes present in the lower urethra.
- The primary component of microflora in human vagina is Lactobacillus sp. which maintain the low pH of vaginal secretion in adults and thus has a protective role.
- When antibiotics are used, the number of Lactobacilli is reduced resulting in growing of disease causing microorganism such as Candida albicans.
- **Infection occurs** – Most prevalent in the female because of the shortness of the urethra and proximity of the urethra to the anus where gram negative bacterial sp. are abundant etc.



# *Thank you*

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