

# HOST-PHATHOGEN RELATIONSHIP

# HOST-PATHOGEN RELATIONSHIP

- ◉ **Parasitism:**

Association between 2 organisms where one of them benefits on the expense of the other.

- ◉ **Commensalism:**

Association between two organisms when one benefits from the other without causing harm.

# HOST-MICROBE RELATIONSHIPS

- ◉ **Symbiotic**

Both organisms benefit from the relationship.

- ◉ **Opportunistic:**

Non-pathogenic in normal people, but can be pathogenic in immunocompromised or weak people.

# HOST-MICROBE RELATIONSHIPS

- ◉ **Pathogenicity:**

The ability of the organism to cause a disease.

- ◉ **Virulence:**

The strength of the organism (the ability to cause serious disease)

# BACTERIA CAUSE DISEASES BY TWO MECHANISMS:

## 1- Toxin production:

- Endotoxin
- Exotoxin

Endotoxin	Exotoxin
Not secreted (integral part of the cell wall)	Secreted (released)
Lipopolysaccharide (heat stable)	Polypeptide protein (heat labile)
Produced only by gram (-)ve	Both gram (-)ve & (+)ve
Non-immunogenic	Immunogenic
Non specific (affect many organs)	Specific (act on certain tissues)

# BACTERIA CAUSE DISEASES BY TWO MECHANISMS:

2- Invasion of tissue followed by inflammation:

- Several enzymes secreted by invasive bacteria play a role in pathogenesis.

# VIRULENCE FACTORS

◉ Virulence factors help bacteria to:

- (1) invade the host
- (2) cause disease
- (3) evade host defenses.

◉ The following are types of virulence factors:

*pili* (fimbriae)

Capsules

Endotoxins

Exotoxins

Invasion Factors

# NORMAL FLORA

- Is a term used to describe various bacteria & fungi that are permanently resident in certain body sites of a healthy normal individual.



# NORMAL FLORA

- The sites in which the normal flora colonize depend on:
  1. pH of the site
  2. Temperature
  3. Presence & type of nutrients
- Internal organs usually are **sterile** (no flora)  
e.g.: CNS, blood, liver, spleen, kidney,  
bladder & lower bronchi & alveoli.

# NORMAL FLORA

- ◉ Depending on the relation with the host, normal flora can be:
  - I. Symbiotic: beneficial, e.g.: bacteria that help in synthesis of vit K.
  - II. Commensal: largest group of normal flora , neither beneficial nor harmful.
  - III. Opportunistic: commensal but may cause disease if they found a chance.

# NORMAL FLORA

- **Benefits of Normal flora**

- I. Nutritional function.
- II. Protection

- **Sites of Normal flora:**

1. Skin
2. Respiratory tract
3. GIT
4. Urinary tract

# SKIN

- ◉ Predominantly **staph. epidermidis**
- ◉ It is non-pathogenic on the skin but can cause disease if reached other sites like artificial heart valves & prosthetic joint.

# RESPIRATORY TRACT

- ◉ In the nose: **staph. aureus**

- ◉ In the throat:

Strept. viridance

staph. epidermidis

Neisseria species

# GIT

- ◉ Mouth: Strept. viridance
- ◉ Stomach: few organisms due to high acidity.
- ◉ Small intestine: lactobacilli & yeast (candida albicans)
- ◉ Colon: the major site bacteria in the body.

Most are anaerobes (bacteroides fragilis & clostridium)

The remaining are facultative anaerobes (E.coli)

# UROGENITAL TRACT

- Vagina of adult women: lactobacillus species which produces acid that keeps pH low.
- It prevents growth of potential pathogens.



**THANK YOU!**