

Lecture 4

Host -
Parasite
Relationship

Microbiology 

Done by: محمد الله العنزي

Host - Parasite Relationship 3

Is characterized by fighting of the organism to invade the body and the body defending itself by protective measures

- Human host is in contact with many microorganisms (**normal flora**) only a small number of these (**primary** and **opportunistic** pathogens) can cause **disease**

This can be discussed under:

- **Pathogenicity**
- **Normal flora** (does not always cause a disease)

In this lecture we will discuss Pathogenicity

- Definitions you should know about

Pathogenicity: is the ability of a microorganism to cause disease.

Pathogens: A microorganism having capacity to cause disease in a particular host.

Disease: Is the end product of an infectious process.

Resistance: The ability of the host to prevent establishment of infection by using its defense mechanisms.

Susceptibility: Lack of this resistance and establishment of disease.

Infection: is simply invasion of cells and multiplication by microorganisms without tissue destruction.

Virulence: is an ability to invade and destroy tissue to produce disease.

LD50: which is the number of organisms or mg of toxins that will kill 50% of susceptible lab and it is considered as a measurement for the virulence.

Transmissibility: The ability to spread from one host to another. This enables microorganism to maintain continuity of its species in the event of death of original host.

Host Resistance to Parasite Invasion is divided into:

1. **Non specific resistance** – part of natural constitution of the host.

- Lysozymes
- Cough
- Neutrophils
- Low pH in the stomach
- Skin mechanical barrier
- Ciliated epithelium of respiratory tract
- Competition by normal flora
- Peristalsis

2. **Specific / Acquired resistance** – to certain organism e.g. **Antibodies**

Pathogens can be divided to:

- ✓ **Primary** pathogens:
Causes disease to healthy people.
e.g. *Bordetella species*
Mycobacterium tuberculosis
- ✓ **Opportunistic** pathogens:
having low pathogenicity and infect people with low immunity.
e.g. *Pseudomonas*

Determinants of Pathogenecity:

Before causing disease a microorganism should have the ability to:

- adhesions
- Survive host natural defense mechanisms
- multiply
- Tissue Destruction: (Ability to overcome host defense and invade tissue and cause destruction to produce clinical disease). And it is produced by:
 - **Toxin production (Exotoxin & Endotoxin)**
 - **Invasion (capsulated & Non-capsulated)**

Exotoxin Vs. Endotoxin

Exotoxin

- Protein
- Soluble & Diffusible
- Heat Labile
- Pharmacologically specific action
- High Immunogenicity
- Inactivated by Chemicals
- No Fever

Endotoxin

- Lipopolysaccharide
- Part of cell wall
- Heat stable
- Non-Specific
- Low Immunogenicity
- Do not form toxoids
- Induce Fever

Notes:



1. (LD50):

- If we need a lot of organisms to reach LD50 that means that the microorganism is a low virulent.
- If we need a few of organisms to reach LD50 that means that the microorganism is a high virulent.

2. Capsule prevent phagocytosis.

3. Read about Koch's Postulates.



For more information go to the lecture..

If you have any notes about this work or about the lecture please send an e-mail to your academic leader.