

GRAM - VE BACTERIA

1)

Diplococci

Ex:

N. gonorrhoeae
N. meningitidis
*N. : Neisseria



2)

Cocoid Rods
(Coccobacilli)

Ex:

- *Bordetella pertussi*
- *Haemophilus influenzae*
- *Brucella*



3)

bacilli

Ex:

- *Shigella* - *E.coli*
- *Salmonella*
- *Legionella pneumophila*
- *Yersinia enterocolitica*
- *Klebsiella* - *Salmonella*
- *Citrobacter* - *Serratia*
- *Pseudomonas*
- *Enterobacter* - *Proteus*



4)

Comma Shaped

Ex:

- *Vibrio cholera*
- *Campylobacter jejuni*
- *Helicobacter pylori*

5)

Spiral Shaped

Ex:

- *Treponema*
- *Leptospira*

6)

Obligate intra-cellular parasites

Ex:

- *Chlamydia*
- *Rickettsia* (highly pleomorphic)
- *Coxiella*

Bacilli

Enterobacteriaceae

- Ubiquitous (they are everywhere) - soil, water, vegetation, normal intestinal flora.
~40 genera, 150 species
- Oxidase negative - no cytochrome oxidase.

1ry pathogens

- Organisms capable of causing disease anyone.

2ry (opportunistic) pathogens

- Organisms that can only cause disease under certain conditions or in certain host.

- *Shigella*
- *Salmonella*
- *Yersinia*

- *E.coli*
- *Klebsiella pneumoniae*
According to the strain.

- *Proteus*
- *Serratia*
- *Enterobacter*
- *Morganella*
- *Providencia*

Nesseria

- Gram-negative intracellular **diplococcus** (Kidney-shaped).
- Evades host response through alteration of surface structures.

N. aonorrheae

Associated with Sexually Transmitted Diseases (STDs).

N. meningitidis

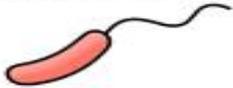
Associated with respiratory and CNS infections. Capsulated.

Vibrio

- Gram-negative. Comma shaped. Monotrichous.

V. cholera

- non-inflammatory (toxin mediator). Causes cholera.
- Infected by ingesting contaminated food and water.
- Found most often in communities with poor sewage and water treatment.

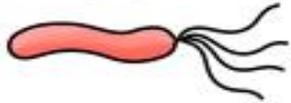


Helicobacter

- Gram-negative. Comma shaped. Lophotrichous.

H. pylori

- Slightly helical, highly motile. Colonizes the stomach of its hosts (produces numerous virulence factors).
- Causes most (if not all) peptic ulcers.
- Coffee drinking, smoking, and drinking alcohol increase your risk for an ulcer.
- **Diagnosis** by Simple blood, breath, and stool tests.
- The most accurate way to **diagnose** is through upper endoscopy.



Haemophilus

- Gram-negative. coccobacilli. Fastidious. Culture in chocolate agar.
- **Blood –Loving Bacilli.**

H.influenzae

- have a polysaccharide capsule that resists phagocytosis.
- Colonize the mucous membranes.
- **H.influenzae type b** is the most significant :
 - Was the most common form of **meningitis in infants** prior to the use of an effective vaccine.
 - Use of the Hib vaccine has eliminated much of the disease caused by **H.influenzae b**.

Bordetella

- Small, aerobic, nonmotile coccobacillus.

B. pertussis

- Causes pertussis, also called **whooping cough**.
- Most cases of disease are in children.
- Bacteria are first inhaled in aerosols and multiply in epithelial cells.
- Then progress through three stages of disease.

Brucellacea

- Coccobacillus.

Brucella

- Causes Brucellosis in man following ingestion of contaminated milk or cheese from goats and cows.
- Clinical manifestations range from subclinical, to chronic with low grade symptoms of low fever and muscular stiffness, to acute with fever and chills.

Pseudomonas

- Gram-negative, aerobic bacilli.
- Ubiquitous in soil, decaying organic matter, and almost every moist environment.
- Problematic in hospitals because they can be found in numerous locations.
- Opportunistic pathogens.

Spirochetes



- Thin, tightly coiled, helically shaped bacteria.
- Moves in a corkscrew fashion through its environment.
 - *This movement is thought to enable pathogenic spirochetes to burrow through their hosts' tissues.
- 2 genera cause human disease.
 - *Treponema & Leptospira*

Rickettsias

- Extremely small.
- **Obligate intracellular parasites.**
- Transmitted via arthropod vectors :
 - Tick, Mites, Lice
- The causative agent of Typhus group and Spotted fever.

Chlamydia

- Grow and multiply only within the vesicles of host cells.
- Have a unique developmental cycle involving two forms.
 - *Both forms can occur within the phagosome of a host cell.

Chlamydia trachomatis

- Causes two main types of disease
 - 1. Sexually transmitted diseases:**
 - *Causes the most common sexually transmitted disease in the United States.
 - 2. Ocular disease called trachoma:**
 - *Occur particularly in children.
 - *Endemic in crowded, poor communities with poor hygiene, inadequate sanitation, and inferior medical care.

Legionella pneumophila

- Aerobic, Gram negative bacilli.
- Universal inhabitants of water.
- Humans acquire the disease by inhaling the bacteria in aerosols from various water sources.
- Causes Legionnaires' disease :
 - *Results in pneumonia.
 - *Immunocompromised individuals are more susceptible.

Common organisms associated with enteric infections

	I	II	III
Mechanism:	Non-inflammatory (enterotoxin)	Inflammatory (invasive, cytotoxin)	Penetrating (invasive, spread)
Location:	proximal small bowel	colon	distal small bowel
Illness:	Diarrhea	Dysentery	Enteric fever
Example organisms:	<i>V. cholerae</i> <i>E. coli</i> <i>Salmonella</i> <i>Campylobacter</i>	<i>Shigella</i> <i>Invasive E. coli</i> <i>S. enteritidis</i>	<i>S. typhi</i> <i>Y. enterocolitica</i>