

# GRAM NEGATIVE RODS OF RESPIRATORY TRACT

*Haemophilus*

*Bordetella*

# *HAEMOPHILUS & BORDETELLA*

- ◉ Haemophilus and Bordetella are small, Gram-negative rods that tend to assume a coccobacillary shape.
- ◉ They are nonmotile, non - spore forming, with complex nutritional growth requirements for blood-containing media.

# *HAEMOPHILUS INFLUENZAE*

- ⦿ H. influenzae may or may not have a capsule.
- ⦿ H. influenzae can be found in the normal nasopharyngeal flora

# INVASIVE DISEASE

- For unknown reasons, *H. influenzae* strains commonly found in the normal flora of the nasopharynx occasionally invade into deeper tissues.
- Bacteremia then leads to spread to the central nervous system causing **Meningitis** and metastatic infections at distant sites such as bones and joints.

# LOCALIZED DISEASE

- ◉ Non encapsulated *H. influenzae* produce *disease in* the middle ear, sinuses, or bronchi.
- ◉ Acute epiglottitis is a dramatic infection in which the inflamed epiglottis and surrounding tissues obstruct the airway

# BORDETELLA PERTUSSIS

- It produces:
  - a) Pertussis toxin (PT)
  - b) Tracheal cytotoxin
- It causes Whooping cough (Pertusis): *B. pertussis* is spread by *airborne droplet nuclei produced by patients in the early stages* of illness. It is highly **contagious**

*GRAM (-) VE  
RODS  
(ZOOTOTIC)*

# BRUCELLA

- Brucella species are small, coccobacillary, Gram-negative rods
- They are nonmotile, non-acid fast, and non-spore forming
- Brucella melitensis (sheep, goats), Brucella abortus (cattle), and Brucella suis (pigs) are the most important in human disease.



# BRUCELLOSIS (MEDITERRANEAN FEVER)

- Brucellosis is a genitourinary infection of sheep, cattle, pigs, and other animals.
- Humans such as farmers, slaughterhouse workers, and veterinarians become infected directly by occupational contact or indirectly by consumption of contaminated animal products such as milk.

# BRUCELLOSIS (MEDITERRANEAN FEVER)

- In humans, brucellosis is a chronic illness characterized by fever, night sweats, and weight loss lasting weeks to months.
- All *Brucella species* are facultative intracellular parasites of epithelial cells and professional phagocytes.

# *YERSINIA PESTIS*

- Plague, an infection of rodents transmitted to humans by the bite of infected fleas, is the most explosively virulent disease known.
- Most cases begin with a painful swollen lymph node (bubo) from which the bacteria rapidly spread to the bloodstream.

# PLAGUE

- The bite of the flea is the first event in the development of a case of **bubonic plague**, which, even if serious enough to kill the patient, is **not contagious** to other humans.
- However, some patients with bubonic plague develop a secondary pneumonia by bacteremic spread to the lungs.
- This **pneumonic plague** is highly contagious person-to-person by the respiratory droplet route.

# PLAGUE

- Pneumonic plague characterise with mucoid, then bloody sputum.
- Cough, production of sputum, dyspnea, and cyanosis develop later in the course
- A terminal cyanosis seen with pneumonic plague is responsible for the term **Black Death**

Thank you!

The image features the words "Thank you!" in a highly decorative, bubbly font. Each letter is a different color and has a thick, textured outline. The letters are arranged in two rows: "Thank" on top and "you!" on the bottom. The colors used are yellow, orange, green, purple, red, blue, and pink. Several stylized flowers in various colors (blue, pink, light blue) are scattered around the text, adding to the festive and appreciative theme. The background is white, and there is a purple vertical bar on the right side of the image.