Klebsiella, Enterobacter, Serratia & Hafnia sp

- Usually found in intestinal tract
- Wide variety of infections, primarily pneumonia, wound, and UTI

General characteristics:

– Some species are non-motile

– Simmons citrate positive

– H_2S negative

– Phenylalanine deaminase negative

– Some weakly urease positive

– MR negative; VP positive

Klebsiella species

- Usually found in GI tract
- Four major species
- *K. pneumoniae* is mostly commonly isolated species

– Possesses a polysaccharide capsule, which protects against phagocytosis and antibiotics and makes the colonies moist and mucoid .

– Has a distinctive “yeasty” odor .

– Frequent cause of nosocomial pneumonia .

– Significant biochemical reactions

- Lactose positive
- Most are urease positive

Klebsiella

- ***Klebsiella*** is a genus of non-motile, Gram-negative, oxidase-negative, rod-shaped bacteria with a prominent polysaccharide-based capsule. It is named after the German microbiologist Edwin Kleb's (1834–1913). Frequent human pathogens, *Klebsiella* organisms can lead to a wide range of disease

states, notably pneumonia, urinary tract infections, septicaemia, and soft tissue infections .

- The genus was originally divided into 3 main species based on biochemical reactions. Today, 7 species with demonstrated similarities in DNA homology are known. These are (1) *Klebsiella pneumoniae*, (2) *Klebsiella ozaenae*, (3) *Klebsiella rhinoscleromatis*, (4) *Klebsiella oxytoca*, (5) *Klebsiella planticola*, (6) *Klebsiella terrigena*, and (7) *Klebsiella ornithinolytica* .
- ***K pneumoniae*** is the most medically important species of the group. *K oxytoca* and *K rhinoscleromatis* have also been demonstrated in human clinical specimens. In recent years, klebsiellae have become important pathogens in nosocomial infections .

General characteristics:

- NF of GI tract, but potential pathogen in other areas
- TSI A/A + gas
- Urea +
- Citrate +
- MR- , VP+
- Motility

Enterobacter species

- Comprised of 12 species; *E. cloacae and E. aerogenes* are most common
- Isolated from wounds, urine, blood and CSF
- Major characteristics

– Colonies resemble *Klebsiella*

– Motile

– MR negative; VP positive

Serratia species

- Seven species, but *S. marcescens* is the only one clinically important .
- Frequently found in nosocomial infections of urinary or respiratory tracts .
- Implicated in bacteremic outbreaks in nurseries, cardiac surgery, and burn units .
- Fairly resistant to antibiotics .
- Major characteristics .
  - Ferments lactose slowly
  - Produce characteristic pink pigment, especially when cultures are left at room temperature.