GNR’s –
Oxidase Positive Fermenters

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General Characteristics

• Gram negative rods
• Ferment glucose
• Oxidase positive
• Growth on BAP and MAC
• Polar flagella (if motile)

Vibrio species

• Vibrio cholera
• Vibrio parahaemolyticus
• Vibrio vulnificus

Vibrio cholera

Colony Morphology

• Thiosulfate citrate bile salts sucrose agar (TCBS)
  – pH 8.6
  – Yellow colony
• Alkaline peptone broth
  – pH 8.6
• Grows on BAP and MAC

Vibrio cholera

Gram Stain

• Straight or slightly curved GNR

Vibrio cholera

Identification

• Lactose non-“F”
• Sucrose “F”
• ODC positive
• LDC positive
• Indole positive
• Growth in 0% salt
• Variable growth in 6% salt
**Vibrio cholera**

**Pathogenesis**
- Cholera
  - Rice water stools
  - Due to enterotoxin
  - Dehydration
  - Man only host
- Transmission
- Treatment

**Vibrio parahaemolyticus**

**Colony Morphology**
- TCBS agar
  - Green colony
- Halophilic
  - 0.5% salt to 8% salt

**Vibrio parahaemolyticus**

**Gram Stain**
- Straight or slightly curved GNR

**Vibrio parahaemolyticus**

**Identification**
- Lactose non-"F"
- Sucrose non-"F"
- ODC positive
- LDC positive
- Indole positive
- NO growth in 0% salt
- Growth in 6% salt

**Vibrio vulnificus**

**Pathogenesis**
- Food poisoning
  - Common in Japan, some in USA
  - Eat raw seafood or steamed clams

**Vibrio parahaemolyticus**

**Colony Morphology**
- TCBS agar
  - Colony is green
**Vibrio vulnificus**

**Gram Stain**
- Straight or slightly curved GNR

**Identification**
- Lactose variable
- Sucrose variable
- ODC variable
- LDC positive
- Indole positive
- NO growth in 0% salt
- Variable growth in 6% salt

**Pathogenesis**
- Intestinal
  - Highly invasive
  - Septicemia can be fatal
  - Increase incidence in liver disease patients
- Wound infections

**Aeromonas species**

**Colony morphology**
- Beta hemolytic on sheep blood agar

**Gram stain**
- Straight GNR

**Identification**
- Lactose non-“F”
- Sucrose “F”
- LDC, ADH, Indole, Esclain & Gelatin positive
- ODC negative
- Growth in 0% salt
- No growth in 6% salt

**Pathogenesis**
- Habitat
  - Water and sewage
- Diarrhea
- UTI
- Wound infections
- Septicemia (liver/pancreatic cancer)
- Osteomyelitis
**Plesiomonas species**

- Colony morphology
  - Non-hemolytic on sheep blood agar
- Gram stain
  - Pleomorphic GNR

**Plesiomonas species**

Identification

- Lactose non-"F"
- Sucrose non-"F"
- LDC, ADH, ODC, & Indole positive
- Esculin & Gelatin negative
- Growth in 0% salt
- No growth in 6% salt

**Plesiomonas species**

Pathogenesis

- Habitat
  - Fresh water in tropical areas
- Gastroenteritis

**Summary**

- General characteristics
- Growth characteristics & Identification
  - Vibrio species
  - Aeromonas species
  - Plesiomonas species
- Clinical significance

**Who am I?**

- Gram stain TCBS
  - Oxidase positive, ODC +, LDC +, Indole +, Sucrose "F"
  - *Vibrio cholera*

**Who am I?**

- Blood agar plate MacConkey agar plate OF Dextrose
  - Oxidase +, Sucrose "F", LDC +, ADH +, ODC -
  - *Aeromonas species*
### Pasteurella species

**General Characteristics**
- Short, straight GNRs
- Ferments glucose
- Oxidase positive
- Growth on BAP
- No growth on MAC
- Non-motile

### Pasteurella multocida

**Colony Morphology**
- BAP
  - Convex, smooth, gray
  - Nonhemolytic
  - Musty/mushroom odor
- No growth on MAC

### Pasteurella multocida

**Gram Stain**
- Short, straight GNR

### Pasteurella multocida

**Identification**
- Weak Glucose “F” (apple green)
- Indole positive
- ODC positive
- Urease negative
- Penicillin (2 units) very “S”

### Pasteurella multocida

**Pathogenesis**
- Wound infection
  - Animal bites (cats, dogs)
- Meningitis, brain abscess
- Abdominal abscess
- Septicemia
- Chronic pulmonary infections

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**Who am I?**

Blood agar plate  MacConkey agar plate  OF Dextrose
Short GNR, Oxidase positive, Indole positive, Penicillin “S”

*Pasteurella multocida*