Gram Negative Rods, oxidase positive, glucose fermenters, growth on MacConkey agar

- General characteristics and morphology
  - Facultative gram negative rod
  - Ferments glucose
  - Oxidase positive (must test from blood agar plate)
  - Grows on Blood agar and MacConkey agar
  - When motile, has polar flagella

A. Vibrio species

1. Vibrio cholera
   a. Morphology and characteristics
      i. Isolation and colonial morphology
         • Isolate on Thiosulfate citrate bile salts, sucrose (TCBS) agar (pH 8.6) – colony color is yellow
         • Alkaline peptone broth – pH 8.6
         • MacConkey agar
         • Blood agar
      ii. Gram stain morphology
         • Straight or slightly curved gram negative rod
      iii. Identification
         • Lactose = non-“F”
         • Sucrose = “F”
         • ODC and LDC = positive
         • Indole positive
         • Growth in 0% NaCl
         • Variable growth in 6% NaCl
   b. Disease states
      i. Cholera
         • Rice water stools – enterotoxin production
         • Dehydration
         • Man is the only host
         • Transmission
         • Treatment

2. Vibrio parahemolyticus
   a. Morphology and characteristics
      i. Isolation and colonial morphology
         • Isolate on Thiosulfate citrate bile salts, sucrose (TCBS) agar (pH 8.6) – colony color is green
         • Halophilic – requires at least 0.5% NaCl for growth, tolerates up to 8% NaCl
      ii. Gram stain morphology
         • Straight or slightly curved gram negative rod
iii. Identification
- Lactose = non-"F"
- Sucrose = non-"F"
- ODC and LDC = positive
- Indole = positive
- No growth in 0% NaCl
- Growth in 6% NaCl

b. Disease states
i. Food poisoning
   - Common in Japan, incidence increasing in U.S.
   - Raw seafood, steamed clams

3. Vibrio vulnificus
   a. Morphology and characteristics
      i. Isolation and colonial morphology
         - Isolate on Thiosulfate citrate bile salts, sucrose (TCBS) agar (pH 8.6) – colony color is green
      ii. Gram stain morphology
         - Straight or slightly curved gram negative rod
   iii. Identification
      - Lactose = variable
      - Sucrose = variable
      - ODC = variable
      - LDC = positive
      - Indole = positive
      - No growth in 0% NaCl
      - Variable growth in 6% NaCl

b. Disease states
   i. Intestinal – highly invasive
      - Can cause fatal septicemia
      - Increased incidence in patient with underlying liver disease
   ii. Wound infections

B. Aeromonas species
   1. Aeromonas hydrophila
      a. Morphology and characteristics
         i. Colonial morphology
            - Beta-hemolytic on SBA
         ii. Gram stain morphology
            - Straight gram negative rod
iii. Identification
   - Lactose = non-“F”
   - Sucrose = “F”
   - LDC and ADH = positive
   - ODC = negative
   - Indole = positive
   - Growth in 0% NaCl
   - No growth in 6% NaCl
   - Esculin = positive
   - Gelatin = positive

b. Habitat
   i. Water and sewage

C. Plesiomonas species
   1. *Plesiomonas shigelloides*
      a. Morphology and characteristics
         i. Colonial morphology
            - Non-hemolytic on SBA
         ii. Gram stain morphology
            - Pleomorphic gram negative rod
         iii. Identification
            - Lactose = non-“F”
            - Sucrose = non-“F”
            - LDC, ADH and ODC = positive
            - Indole = positive
            - Growth in 0% NaCl
            - No growth in 6% NaCl
            - Esculin = negative
            - Gelatin = negative

b. Habitat
   i. Fresh water in tropical areas

c. Disease states
   i. Gastroenteritis
Gram Negative Rods, oxidase positive, glucose fermenters, no growth on MacConkey agar

- General characteristics and morphology
  - Short, straight gram negative rod
  - Ferments glucose
  - Oxidase positive
  - Grows on Blood agar
  - No growth on MacConkey agar
  - Non-motile

A. Pasteurella species

1. *Pasteurella multocida*
   a. Morphology and characteristics
      i. Colonial morphology
         - On SBA: convex, smooth, gray, nonhemolytic
         - May have a musty or mushroom smell
         - No growth on MacConkey agar
      ii. Identification
         - Glucose = weak fermenter (apple-green color)
         - Indole = positive
         - ODC = positive
         - Urease = negative
         - Penicillin (2 units) = very sensitive
   b. Disease states
      i. Wound infection
         - From animal bites (cats and dogs)
      ii. Other infections
         - Meningitis, brain abscess, abdominal abscess, bacteremia, chronic pulmonary problems