

**PSEUDOMONAS**

## Characteristics:

- Gram Negative bacilli; aerobic, motile and oxidase positive.

## **Growth Requirements:**

- Can use a variety of carbon and nitrogen sources i.e. have minimal growth requirements.
- Thus grow readily and also persist in the environment.
- It is difficult to eradicate from contaminated environments e.g. **hospital wards**.
- The species are common inhabitants of soil and water are widespread.

## Media:

- Grow readily on NA, BA and MacConkey on which they are NLFs.
- About 1/3 of clinical isolates produce a characteristic green/blue dye called pyocyanin.
- **Biochemically:** non-fermentative, obtain energy from oxidation of sugars.
- Antibiotic Resistance: They are naturally resistant to many antibiotics e.g. penicillin, ampicillin, tetracycline, most cephalosporins.

## Sensitive only to:

- Aminoglycosides
- Quinolones
- Ceftazidime (3<sup>rd</sup> generation cephalosporin and some other  $\beta$ -lactams e.g. Piperacillin)
- Polymyxins

## Pathogenesis:

- It is an important opportunistic pathogen causing infections in immunocompromised patients e.g. burns and cancer patients with cystic fibrosis.

## Virulence factors:

- Pili – for colonization
- Lipopolysaccharide – lipid A
- Exotoxin a – inhibition of protein synthesis (= diphtheria exotoxin). Involved in tissue damage.
- Exotoxin S. Tissue damage and also enhances dissemination.
- Protease: vasculitis and hemorrhagic lesions
- Elastase/phospholipase: Tissue damage.

## Predisposing factors and Infections:

- Neutropaenia e.g. in leukaemia – septicaemia
- Burns –wound infection and septicaemia
- Cystic fibrosis – pneumonia
- Trachoestomies – wound colonisation and pneumonia
- Cystoscopy and catheterization – urinary tract infection
- Trauma – osteomyelitis
- Surgical operation – wound infections
- Neurosurgical operation – meningitis
- Corneal injury – panophthalmitis
- Diabetes – malignant otitis externa

➤ Infections acquired from

- Water taps\
- Drains

➤ Enter the body through endotracheal tubes, and minor skin abrasions.

### **Epidemiology:**

- It is important nosocomial (hospital-acquired) pathogen.
- Able to survive and even grow in some disinfectants used in hospitals.

# Treatment

## Points to Note:

- 1- It is resistant to a number of antibiotics and therefore choice is limited.
- 2- Secondly it has tendency to develop resistance to the few useful antibiotics available.
- 3- Thirdly its infections occur mainly in immunocompromised patients. Consequently treatment of pseudomonas infections can be difficult.