

## Please read this bit first

The HPCSA and the Med Tech Society have confirmed that this clinical case study, plus your routine review of your EQA reports from Thistle QA, should be documented as a "Journal Club" activity. This means that you must record those attending for CEU purposes. Thistle will **not** issue a certificate to cover these activities, nor send out "correct" answers to the CEU questions at the end of this case study.

The Thistle QA CEU No is: **MT00025**.

Each attendee should claim **THREE** CEU points for completing this Quality Control Journal Club exercise, and retain a copy of the relevant Thistle QA Participation Certificate as proof of registration on a Thistle QA EQA.

## Cycle 23 Organism 7:

### Pseudomonas and Pseudomonas-like Bacteria

The genus *Pseudomonas* comprises a relatively large and important group of Gram-negative bacteria. Members of the genus are found abundantly as free-living organisms in soils, fresh water and marine environments, and in many other natural habitats. They may also be found in associations with plants and animals as normal flora or as agents of disease.

The bacteriological criteria that distinguish the members of the genus *Pseudomonas* are given below.

Gram-negative

Rod-shaped, 0.5-0.8  $\mu\text{m}$  x 1-3  $\mu\text{m}$

Strictly aerobic; the only anaerobic activities may be denitrification and arginine degradation to ornithine

Motile by polar flagella; some strains also produce lateral flagella

Oxidative, chemoorganotrophic metabolism

Catalase-positive

Usually oxidase-positive

No organic growth factors are required

Diffusible and/or insoluble pigments may be produced

GC content of the DNA: 58-68 mol%

### **Pathogen Habitats**

In hospitals, *P. aeruginosa* can be spread through faecal material. Also, *Pseudomonas* has been isolated from many natural and manufactured foods, and therefore, foods have been implicated as sources of infection in hospitals. In addition, visitors can transport the bacteria to the hospital as contaminants in foods, plants, flowers and presents. Health personnel may also be involved.

The widespread habitat of *P. aeruginosa* in nature, which includes soil, water, food, and the surfaces of plants and animals, makes it very difficult to control the organism in a hospital setting. Prevention of contamination is practically impossible. The main danger is the infection of patients who are immunologically compromised, or in burn units, neonatal units and cancer wards. When conditions are favourable, *P. aeruginosa* can infect wounds, burnt areas, and the urinary and respiratory tracts, and may also be involved in pneumonia, endocarditis, meningitis, and various other pathological conditions.

### ***Pseudomonas aeruginosa***

The colonies of *P. aeruginosa* are flat, grayish, with irregular edges, and with time they tend to spread on the surface of the agar. Muroid colonies frequently appear among isolates from the respiratory tract of patients with cystic fibrosis. The muroid extracellular substance is alginate.

*P. aeruginosa* has long been known as an opportunistic pathogen, especially dreaded in the hospital environment. Early reports pointing to infection with this organism described a “blue pus” associated with wound infections. *P. aeruginosa* has been isolated from wounds in almost all locations in the human or animal body, as well from purulent infections of the urinary and respiratory tracts. *P. aeruginosa* associated with pneumonia, enteritis, vaginitis, mastitis, and endometritis in animals is abundantly recorded in the literature.

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### **CPD Questions:**

1. Describe the appearance and colour of the colonies of this organism on blood agar.
  2. What sources are there in nature for this organism?
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