Pseudomonas Aeruginosa

Source: TH

A recent study found that **Pseudomonas aeruginosa bacteria** can have two different gene expressions **(bistable gene expression)** in **identical cells**, with some cells having certain genes "on" and others having them "off."

- The **glpD gene**, which helps the **bacteria use glycero**l, shows variable expression- in some cells, it is active (on), increasing infectivity, while in others, it is inactive (off).
- This variability is a form of **epigenetic inheritance**, meaning that gene expression can be passed down **without changes to the DNA.**

Pseudomonas Aeruginosa

- **About:** It is a **Gram-negative, aerobic, non-spore-forming, rod-shaped bacterium**, widely found in the environment like in soil & water, especially **freshwater.**
- **Infection Potential:** Can infect both **healthy (immunocompetent)** and **weakened (immunocompromised)** hosts.
    - It can cause **community-acquired infections** (**folliculitis, puncture-wound osteomyelitis, pneumonia, and otitis externa)**.
    - **It is responsible for** 30% of **hospital-acquired infections (HAIs) in India** such as **ventilator-associated pneumonia, catheter-related urinary tract infections**, and **bloodstream infections.**
    - It feeds on **plastic surfaces**, and is a major cause of **keratitis (eye infection)** and fatal **burn infections**, thriving in **ICU patients**.
- **Antibiotic Resistance:** It is **highly resistant** due to **its built-in resistance (like tough outer membrane and efflux pumps)** and **acquired resistance** (mutations, plasmids, transposons, integrons).
- Only a few antibiotics remain effective such as **tobramycin, amikacin, etc**.

Read More: Antimicrobial Resistance: The Urgent Call for Action