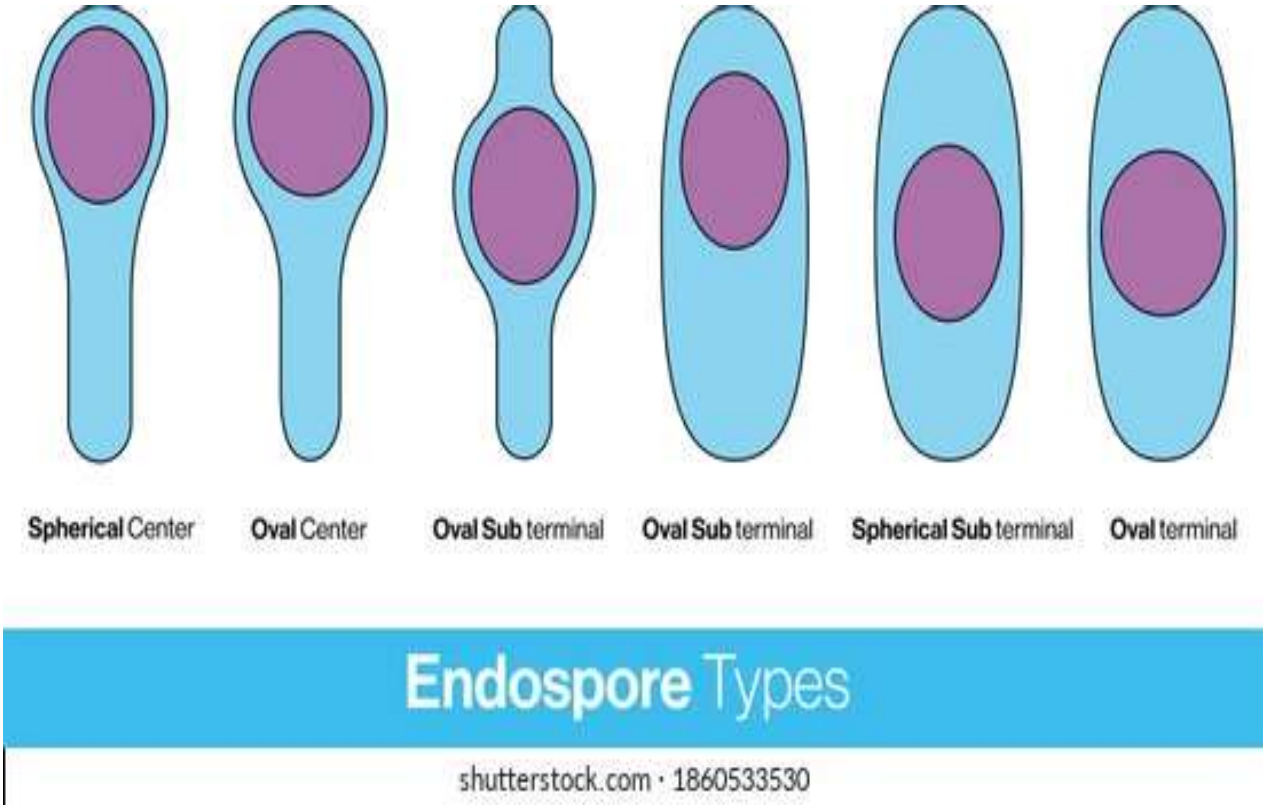
Bacterial taxonomy Lab:3

Special Stains

Endospore stain

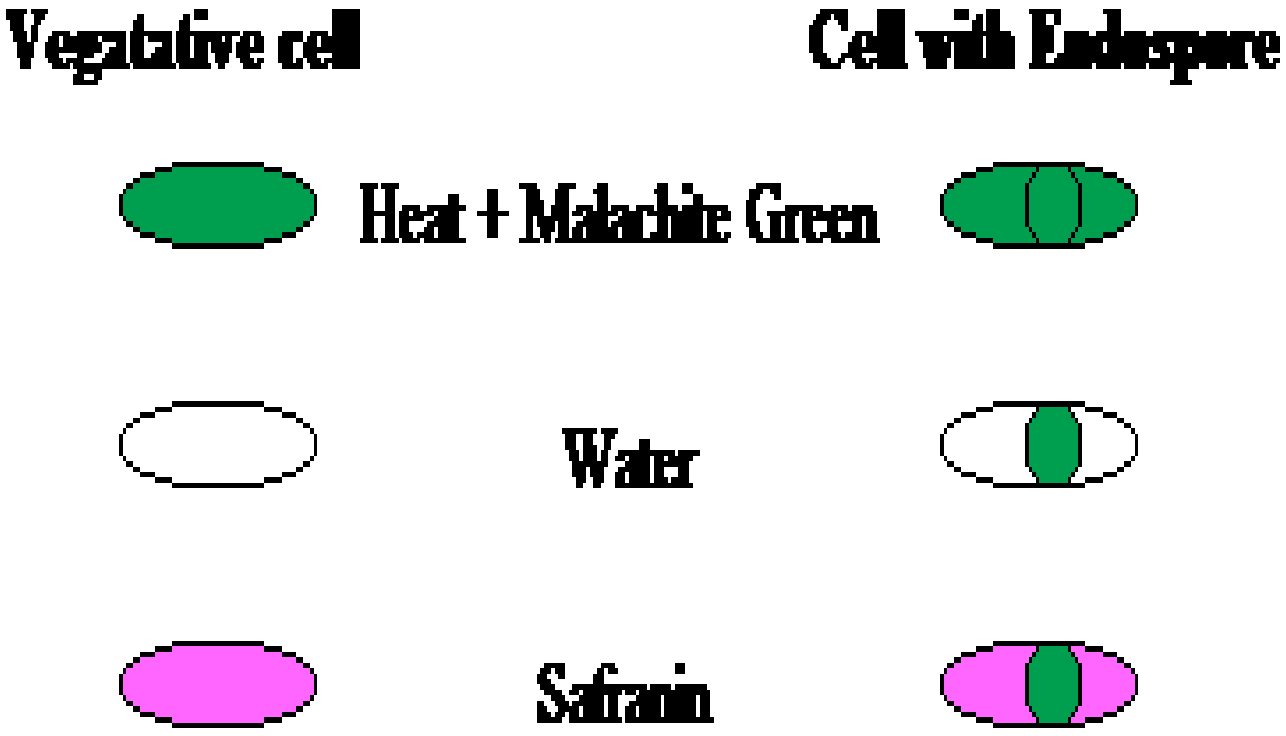
Endospore staining is a differential staining technique, most commonly the Schaeffer-Fulton method, used to identify and visualize bacterial endospores (Bacillus or Clostridium) by staining them green with heat-fixed malachite green and vegetative cells red/pink with safranin. It distinguishes tough, dormant, keratin-coated endospores from metabolically active vegetative cells.

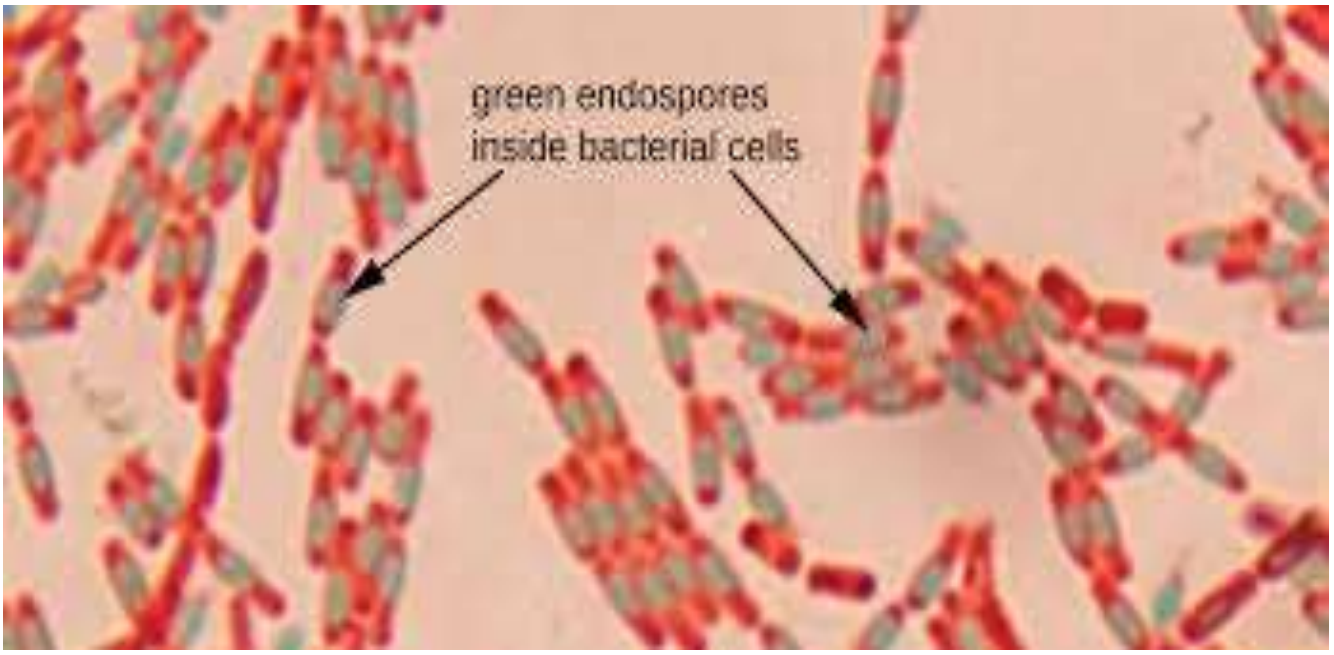


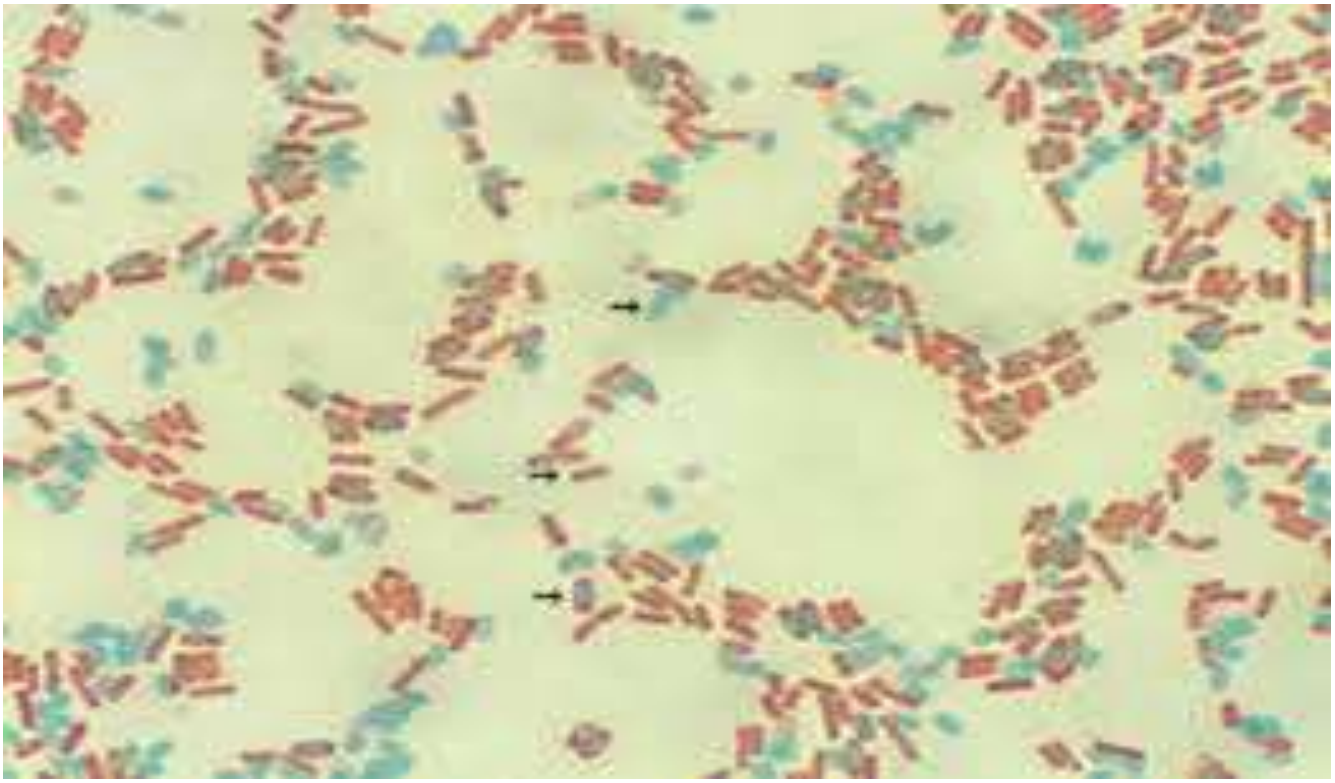
The Principles and Procedures:

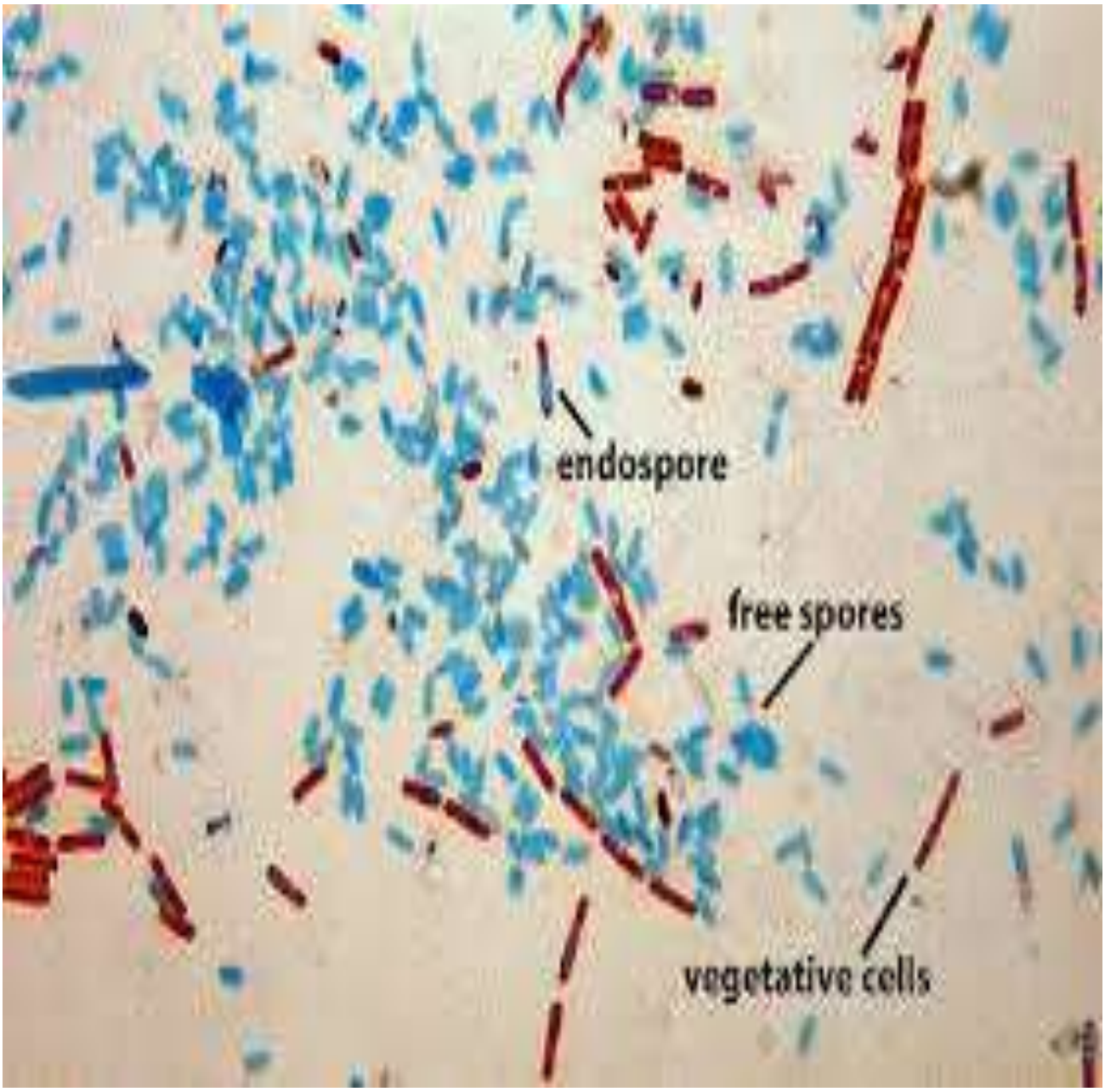
- **Purpose:** Differentiates endospores from vegetative cells and detects spore-formers.
- **Mechanism:** Endospores are highly resistant to chemicals; heat (steaming) is required to drive the primary stain, malachite green, into the spore wall.

- **Steps:**
  - **Prepare a smear and heat-fix it.**
  - **Apply malachite green while steaming for 5-10 minutes.**
  - **Rinse with water to decolorize the vegetative cells.**
  - **Counterstain with safranin for 1-2 minutes.**
- **Results: Endospores appear green, while vegetative cells appear red or pink.**




green endospores
inside bacterial cells




endospore
free spores
vegetative cells


paper towel
Malachite green dye
wikiHow