

Acid Fast Stain

Purpose: The acid-fast stain is a **differential stain** which distinguishes organisms with waxy cell walls that can resist decolorization with acid alcohol.

How it works: Acid-fast bacteria have a waxy substance called **mycolic acid** in their cell walls which makes them impermeable to many staining procedures, including the Gram stain. These bacteria are termed "acid-fast" because they are able to resist decolorization with acid alcohol.

Carbol fuchsin is the **primary stain** in this procedure, and it contains phenol to help solubilize the cell wall. **Heat** is also applied during the primary stain to increase stain penetration. All cell types will take up the primary stain. The cells are then **decolorized** with **acid-alcohol**, which decolorizes all cells except the acid-fast ones. **Methylene blue** is then applied to **counterstain** any cells which have been decolorized. At the end of the staining process, acid-fast cells will be reddish-pink, and non-acid fast cells will be blue. (Note: Acid-fast stains are performed on smears that have been **heat-fixed**.)

Overview of acid-fast staining process:



Results:



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