# Gram stain

Gram stain or Gram staining, also called Gram's method, is a method of staining used to distinguish and classify bacterial species into two large groups: gram-positive bacteria and gram-negative bacteria. The name comes from the Danish bacteriologist Hans Christian Gram, who developed the technique.

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In Gram staining, the outer lipid-based membrane of gram-negative bacteria is removed by an alcohol solution. The alcohol also decolorizes the then exposed peptidoglycan layer by dissolving away the previously applied crystal violet. A counterstain (safranin or fuchsine) is then added which recolorizes the bacteria red or pink.

see Gram-positive bacteria

see Gram negative bacteria

A study demonstrates that while very specific for infection, the sensitivity of intraoperative Gram staining is low, and agreement between positive cultures and Gram stains is very poor. Gram staining demonstrated limited cost-effectiveness because of the low prevalence of findings that altered patient management [1)].

1)
Shifflett GD, Nwachukwu BU, Bjerke-Kroll BT, Kueper J, Koltsov JB, Sama AA, Girardi FP, Cammisa FP, Hughes AP. The value of intraoperative Gram stain in revision spine surgery. Spine J. 2015 Oct 1;15(10):2198-205. doi: 10.1016/j.spinee.2015.06.001. Epub 2015 Jun 10. PubMed PMID: 26070285.