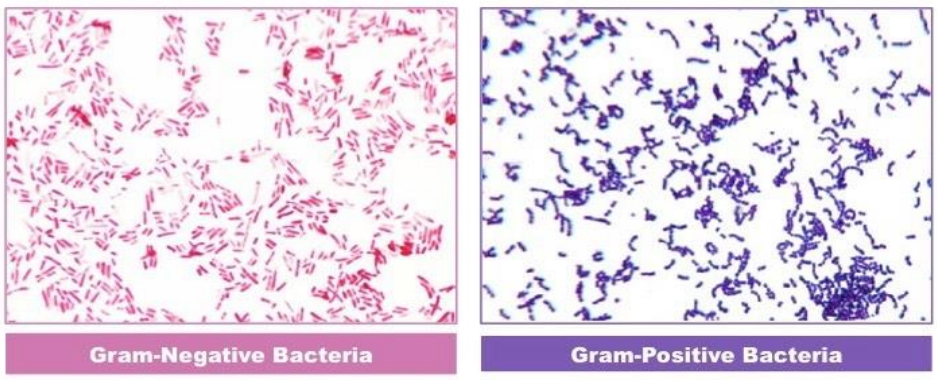
In the seventh of our A-Z series we take a look at a more common stain, and one you are likely to be familiar with. In this post we will be talking about Gram staining.

Gram staining is used to stain bacteria and helps to determine if the bacteria are Gram positive or Gram negative. The stain differentiates bacteria based on the properties of their cell wall, specifically the thickness of the peptidoglycan layer. Peptidoglycan is a component of the bacterial cell well which gives structural strength to the cell. A thick layer of peptidoglycan retains the primary stain (crystal violet) so Gram positive cells are stained purple. A thin layer of

peptidoglycan does not retain the primary stain which washes out when ethanol is added. The counterstain, such as safranin or carbol fuchsin, then follows and stains the Gram negative cells pink or red.

Gram staining is a commonplace and important tool in the laboratory for the initial investigation of bacterial samples but there are some bacteria which cannot be classified by this technique. These bacteria form the Gram variable or Gram indeterminate groups. A well-known example of a Gram indeterminate bacterium is *Mycobacterium tuberculosis*, the cause of tuberculosis. This laboratory staple was developed in 1884 in Berlin by Hans Christian Joachim Gram. Though it is now used to help categorise bacteria, it was originally intended simply to make bacteria more visible under the microscope. The Danish bacteriologist first studied at the University of Copenhagen and was later both a professor of pharmacology and professor of medicine in his distinguished career. Some of his initial work was with human red blood cells and he helped to identify the typical traits of the blood of people with pernicious anaemia. Is Gram staining something you commonly use in your lab? Do you find most of the bacteria you stain are Gram negative or Gram positive?



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