



The Royal College of Pathologists

Pathology: the science behind the cure

Object 15: Gram stain



What is it?

The Gram stain is one of the most important stains in the microbiology laboratory, forming the basis of the identification and classification of bacteria. It divides bacteria into two broad categories according to the properties of their cell walls. Gram-positive bacteria, such as MRSA, appear purple under the microscope. Gram-negative bacteria, such as E.coli, appear pink.

History

The Gram stain was first described by Danish bacteriologist Dr Hans Christian Gram in 1884. He recognised the stain's ability to highlight bacteria present in sections of lung tissue from patients with pneumonia. The differential staining of different types of bacteria was an incidental finding.

Pathology

Microbiologists use the Gram stain in labs throughout the world to identify and classify bacteria so that the correct treatment can be given. Gram-positive bacteria typically have a thick peptidoglycan wall, which retains the Gram stain. Gram-negative bacteria have a thinner wall, which does not retain the stain. Gram staining is usually the first step in the identification of bacteria, and is usually used in conjunction with other tests.

Find out more

[Lab Tests Online](#) provides information about the Gram stain and many other laboratory investigations.

The [University of Pennsylvania](#) has some excellent images of different Gram-positive and negative organisms.