

Giemsa Stain Encyclopedia Article

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Giemsa Stain

The Giemsa stain, named after G. Giemsa (1867-1948), is a mixture of two dyes, methylene blue and eosin. Prior to 1960, when Moorehead and Nowell described their use of Giemsa in their **chromosome** preparations, acetoorcein, acetocarmine, gentian violet, hemotoxylin, Leishman's, Wright's and Feulgen stains were used to stain chromosomes.

The Giemsa stain is one of the larger group of Romanowsky stains. The group, which includes the Leishmann, Wright and May-Grünwald stains, give characteristic staining patterns. Specifically, the Giemsa stain produces light and dark bands in chromosomes. Each homologous chromosome pair has a unique pattern of Giemsa-banding, enabling recognition of particular chromosomes. It is the most popular stain for distinguishing different types of white blood cells and for detecting parasitic microorganisms in blood smears. The typical organisms detected include *Plasmodium* (the causative agent of malaria) and *Babesia* (a protozoan that causes a malaria-like illness and hemolytic anemia). In recent years, the staining technique has also been adapted for use with the gastrointestinal bacterium *Helicobacter pylori* and crop plants such as barley.

Typically the stain is applied to dry smears of sample that have been applied to a microscope slide. Staining of thin sections of samples embedded in plastic has also been successful. Detection of the chromosome banding patterns relies upon light microscopy.