

**Classification of Connective Tissue Stains**

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Abstract

Connective tissue comprises a diverse group of cells within a tissue-specific extracellular matrix. Connective tissue stains are used for staining connective tissue components. The special stains commonly used for staining connective tissue components are Van gieson, Masson trichome, Mallory trichome, Martius scarlet blue, Phosphotungstic acid- haematoxylin stain, Periodic acid-Schiff, Aniline blue, Sirius red, Eosin etc. Connective tissue stains have been used extensively for diagnosis of tumors of various origins. Understanding these techniques not only aids us in performing of our staining procedures effectively but also can facilitate the innovation of new methods.

Introduction

Connective tissue comprises a diverse group of cells within a tissue-specific extracellular matrix. Connective tissue encompasses a variety of tissues with differing functional properties but with certain common characteristics that allow them to be grouped together. For convenience, they are classified in a manner that reflects this features.¹ The hematoxylin and eosin stain (H&E) is the most widely used histological stain. Essentially, the hematoxylin component stains the cell nuclei blueblack, showing good intranuclear detail, while the eosin stains cell cytoplasm and most connective tissue fibers in varying shades and intensities of pink, orange, and red.²

The term special stains traditionally referred to any staining other than an H&E. The term “special stains” has long been used to refer to a large number of alternative staining techniques that are used when the H&E does not provide all the information the pathologist or researcher needs. It covers a wide variety of methods that may be used to visualize particular tissue structures, elements, or even microorganisms not identified by H&E staining.³ The purpose of this article is to classify various types of stains used to stain the different types of connective tissue components. So an attempt has been made to gain more insight and knowledge of the stains of connective tissue.

Classification of Connective Tissue Stains**Demonstration of Collagen**

Massons trichrome stain

Mallory trichrome stain

Van Geisons stain

Demonstration of fibrin

Gram Weigert

Phosphotungstic acid hematoxylin

Demonstration of muscle striations

Haematoxylin and eosin and trichrome methods

[Heidenhain iron haematoxylin and Mallory’s phosphotungstic acid haematoxylin]

Demonstration of elastic tissue fibres

Verhoeff

Orcein

Miller's

Weigert's resorcin-Fuchsin

Aldehyde fuchsin

Demonstration of reticulin fibres

Dye Techniques:

1. Gordon and sweet's method

2. Gomori's method

Metal (silver) impregnation method

Demonstration of pigments

Perl's Prussian blue method for ferric iron

Lille's method for ferric and ferrous iron

Melanin: Reducing method

Masson Fontana Stain

Enzyme method

Immunohistochemistry

Demonstration of carbohydrate

Periodic Acid Schiff stain

Alcian Blue stain

Mucicarmine

Demonstration of Nucleic Acid stain

Feulgen reaction

Methyl Green pyronin stain

Demonstration of Fat

Sudan Black stain

Oil Red O stain

Demonstration of Amyloid

Congo Red

Sirus red

Demonstration of Microorganism

Grams's stain

Ziehl Neelsen stain

Warthin Starry method

Discussion

Histological stain for histological diagnosis must stain killed or other non-living tissue element by methods that may appear to be specific for a particular tissue element,

or group of element, but where the mechanism of staining is not understood. The term "special stains" has long been used to refer to a large number of alternative staining techniques that are used when the H&E does not provide all the information to the pathologist or the researcher. The special stains commonly used for staining connective tissue components are Van gieson, PAS, Masson trichome, Mallory trichome, Martius scarlet blue, Phosphotungstic acid- haematoxylin stain, Sirus red, Eosin, Verhoff- Van Gieson stain, Masson Fontana stain, Von kossa to name a few.⁴

Conclusion

Connective tissue comprises a diverse group of cells within a tissue-specific extracellular matrix. A variety of cells with different origins and functions are present in connective tissue.. The hematoxylin and eosin stain (H&E) is the most widely used histological stain. Special or advanced stains are only planned if additional information is needed to provide a more thorough analysis and it covers a wide variety of methods that can be used to visualize particular tissue structures, elements, or even microorganisms not identified by H&E staining. There are various special stains which are used to study the different connective tissue components. Connective tissue stains have been used extensively for diagnosis of tumors of various origins. Understanding these techniques not only aids us in performing of our staining procedures effectively but also can facilitate the innovation of new methods.

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