# Mallory PTAH Stain Solution

# (Spontaneous Oxidation Method)

# M1516033

**Storage:** Room Temperature. Store in the dark.
**Shipping:** Normal.

## Introduction:

Muscle fibers are a component of muscle tissue and are composed of muscle cells. According to their morphological and functional characteristics, muscle fibers can be classified into smooth muscle, skeletal muscle (also known as striated muscle), and cardiac muscle. There are many methods for staining muscle fibers, such as the Ponceau method, Aniline Blue method, and Phosphotungstic Acid Hematoxylin method. When the phosphotungstic acid hematoxylin staining solution was first developed, several versions existed within Mallory's PTAH method. Around 1900, Mallory combined aqueous phosphotungstic acid solution with hematoxylin staining solution and found it produced excellent staining of muscle fibers. The Mallory Phosphotungstic Acid Hematoxylin Staining Solution (PTAH, natural oxidation method) is now widely used. Hematoxylin can also be prepared by the PTAH chemical oxidation method, but it has a shorter shelf life and its staining ability tends to decline. Although natural oxidation takes longer, the resulting hematoxylin can be stored for more than 2 years with stable staining capacity, making it an ideal staining solution. It is suitable for central nervous system (CNS) tissues, general histological structures, and tissues fixed with all standard fixatives. Staining time varies according to the preparation method, fixative used, and histological structure to be demonstrated.

Mallory PTAH Stain Solution (Spontaneous Oxidation Method), also known as Mallory Phosphotungstic Acid Hematoxylin Staining Solution, this is a naturally ripened staining solution with strong staining capacity and long storage stability. It is mainly used to demonstrate cross-striations in striated muscle. Clinically, this method is applied in the diagnosis of rhabdomyosarcoma, which shows diverse histological morphology and is difficult to distinguish from undifferentiated mesenchymal tumors. After phosphotungstic acid hematoxylin staining, the identification of blue cross-striations in the cytoplasm of tumor cells confirms rhabdomyoblastic differentiation. This staining solution can also stain fibrin in inflammatory exudates, fibrin in capillaries in DIC, and structures in neuropathology. This reagent is for research use only. Not for clinical diagnosis or other purposes.

## Materials to be Prepared by the User:

1. 10% formalin fixative, acidified potassium permanganate solution, oxalic acid solution, distilled water, graded ethanol series.

2. Xylene or eco-friendly dewaxing and clearing agent, neutral balsam.
3. Light microscope.

## Operating Procedures (For Reference Only):

1. Fix tissue in 10% formalin fixative, followed by routine dehydration and embedding.
2. Prepare paraffin sections at 4 μm thickness. Dewax in xylene or dewaxing agent and hydrate to water using routine procedures.
3. Oxidize in acidified potassium permanganate for 5 minutes, then rinse briefly with water.
4. Bleach in oxalic acid solution for 1–2 minutes, wash in running tap water for 2 minutes, then rinse once with distilled water.
5. Stain in Mallory PTAH Staining Solution (Natural Oxidation Method) in a covered container for 24–48 hours.
6. Remove sections and quickly rinse excess stain with 95% ethanol.
7. Dehydrate routinely, clear in xylene or dewaxing agent, and mount with neutral balsam.

## Staining Results:

Cross-striations of striated muscle, fibrin, nuclei, red blood cells, neuroglial fibers: Dark blue.
Collagen fibers, cartilage matrix: Brownish red.
Coarse elastic fibers: Purple.

## Precautions:

1. If the blue staining of cross-striations is insufficient or the striations appear bright red, this indicates insufficient or excessive oxidation. Replace the staining solution or prepare a new batch.
2. Do not wash sections with water after Mallory PTAH staining. Rinsing in 95% ethanol must be rapid, as prolonged washing or ethanol treatment will remove the stain.
3. Mallory Phosphotungstic Acid Hematoxylin is a progressive stain; avoid overstaining. After 24 hours of staining, sections may be removed and examined microscopically to assess staining intensity.
4. For your safety and health, wear a lab coat and disposable gloves during operation.