

Product Data Sheet

Product Name: Fast Red Violet LB

Cat. No.: GC66319

Chemical Properties

Cas. No. 32348-81-5

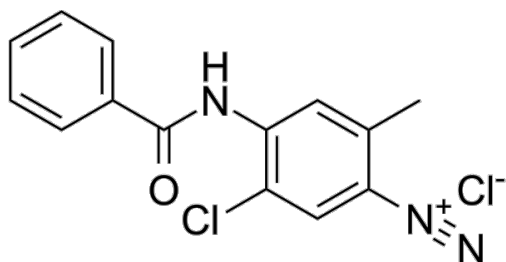
Formula $C_{14}H_{11}Cl_2N_3O \cdot 1/2ZnCl_2$ M.Wt 376.31

Solubility Storage Store at -20°C, protect from light

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

This plan only provides a guide, please modify it to meet your specific needs.

1. Solution preparation

(1) Working solution: Prepare Fast Red Violet LB staining solution with experimental buffer at a

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concentration of 0.6mg/mL.

Note: Please adjust the optimal working concentration according to the actual situation or refer to the literature to set the gradient concentration by yourself. The working solution must be prepared and used immediately.

2. Tartrate-resistant acid phosphatase (TRAP) staining with Fast Red Violet LB (from the literature, for reference only)

(1) Cell staining: Fix the cells with 4% paraformaldehyde in PBS, then wash with PBS, treat with a mixture of acetone and ethanol (1:1) for 1min, wash again with PBS, and incubate in TRAP buffer (pH 5.2) containing 0.2mg/mL naphthol AS-MX phosphate and 0.6mg/mL Fast Red Violet LB at 37°C for 30min. After washing with pure water, observe under a microscope^[1].

(2) Tissue staining: Slides (femur samples) were incubated in sodium acetate buffer (0.1M, pH 5.0) containing naphthol AS-MX phosphate, Fast Red Violet LB, and MnCl₂ in the presence of sodium tartrate at 37°C for 60min for TRAP staining^[2].

3. Alkaline phosphatase (ALP) staining with Fast Red Violet LB (from the literature, for reference only)

(1) Cell staining: After cell fixation, cells were stained with 0.1mg/mL naphthol AS-MX phosphate and 0.6mg/mL Fast Red Violet LB, and then photographed with a digital camera^[3].

(2) Cell 3D culture staining: Samples were fixed with cold 10% neutral formalin buffer for 15min. After rinsing with dH₂O, the samples were incubated with 0.1mg/mL naphthol AS-MX phosphate substrate (dissolved in 0.4% N,N-dimethylformamide and 0.1M HCl, pH 8.3, containing 0.6mg/mL Fast Red Violet LB) at room temperature for 45min to visualize the product. The staining solution was washed away with dH₂O, observed under a stereoscope, and ALP staining was quantified by measuring the percentage of red staining area to total area in each image using ImageJ software^[4].

References:

[1] Imai H, Yoshimura K, Miyamoto Y, et al. Roles of monocarboxylate transporter subtypes in promotion and suppression of osteoclast differentiation and survival on bone[J]. Scientific Reports, 2019, 9(1): 15608.

[2] Hamamura K, Hamajima K, Yo S, et al. Deletion of Gb3 synthase in mice resulted in the attenuation of bone formation via decrease in osteoblasts[J]. International journal of molecular sciences, 2019, 20(18): 4619.

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- [3] Yoo S H, Kim J G, Kim B S, et al. BST2 mediates osteoblast differentiation via the BMP2 signaling pathway in human alveolar-derived bone marrow stromal cells[J]. PloS one, 2016, 11(6): e0158481.
- [4] Ioannidis K, Danalatos R I, Champeris Tsaniras S, et al. A custom ultra-low-cost 3D bioprinter supports cell growth and differentiation[J]. Frontiers in bioengineering and biotechnology, 2020, 8: 580889.

Background

Fast Red Violet LB is an azo dye that can be used to detect tartrate-resistant acid phosphatase (TRAP) and alkaline phosphatase (ALP)^[1, 2]. Fast Red Violet LB, also known as carminic acid, is extracted from the scales of female cochineal insects^[3]. Fast Red Violet LB can be used to study the role of TNF- α in fracture healing^[4]. Fast Red Violet LB can stain naphthol AS-D chloroacetate esterase activity and can be used to detect granulocytes^[5].

References:

- [1] Tsuchiya T, Matsumoto Y, Kurihara S. The fluorescent simultaneous azo dye technique for demonstration of tartrate-resistant acid phosphatase (TRAP) activity in osteoclast-like multinucleate cells[J]. Journal of bone and mineral metabolism, 1995, 13: 71-76.
- [2] Conn's biological stains: a handbook of dyes, stains and fluorochromes for use in biology and medicine[M]. Taylor & Francis, 2020.
- [3] Baqri S S R. Dye-Yielding Insects[J]. Commercial Insects, 2023: 218-237.
- [4] Gerstenfeld L C, Cho T J, Kon T, et al. Impaired fracture healing in the absence of TNF- α signaling: The role of TNF- α in endochondral cartilage resorption[J]. Journal of Bone and Mineral Research, 2003, 18(9): 1584-1592.
- [5] Petrie-Hanson L, Ainsworth A J. Differential cytochemical staining characteristics of channel catfish leukocytes identify cell populations in lymphoid organs[J]. Veterinary Immunology and Immunopathology, 2000, 73(2): 129-144.

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