

Product Information

SIGMAFAST™ Phosphatase Inhibitor Tablets

For General Use, A Broad-Spectrum Inhibitor Cocktail

S8840

Product Description

Phosphorylation is a post-translational modification which regulates enzyme activity and triggers cellular signaling.^{1,2} Additionally, cells contain multiple phosphatases which can dephosphorylate the target proteins.¹⁻³ To study this key biological process, a broad-spectrum inhibitor cocktail is added to cell extracts to preserve the integrity of phosphorylated proteins.^{3,4}

The SIGMAFAST™ Phosphatase Inhibitor Tablet (S8840), is an optimized mixture of water-soluble inhibitors targeting a broad range of phosphatases, including Serine, Tyrosine, Threonine, Acid and Alkaline Phosphatases.

Note: Endogenous proteases are also present during cell lysis which could lead to proteolytic degradation of proteins. Supplementing the lysis buffer with protease inhibitors prevents any proteins of interest from being degraded in this fashion. The Protease Inhibitor Cocktail (S8830) can be used for this purpose.

Components

Each SIGMAFAST™ Phosphatase Inhibitor Tablet can be used to prepare 20 mL of 1X solution, which contains the following inhibitors:

- Bromolevamisole oxalate: potent alkaline phosphatase inhibitor.⁵
- Cantharidin: potent and selective protein phosphatase 2 (PP2A) inhibitor.⁶
- Sodium fluoride: irreversible inhibitor of serine, threonine, and acid phosphatases.^{7,8}
- Sodium orthovanadate: irreversible inhibitor of tyrosine and alkaline phosphatases.^{9,10}

Precautions and Disclaimer

This product is for R&D use only. Not for drug, household, or other uses. Please consult the Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

- The tablets are stable as supplied for approximately 4 years at 2-8 °C.
- Reconstituted SIGMAFAST™ Phosphatase Inhibitor solution (1X or 10X) is stable for approximately 2 weeks at 2-8 °C.
- It is not recommended to freeze reconstituted solutions (1X or 10X), as some materials may precipitate.

Preparation Instructions

One tablet generates 20 mL of 1X phosphatase inhibitor solution. Each tablet can be reconstituted in either water or cell lysis buffer. Alternatively, each tablet can be reconstituted in a 2 mL volume to generate a 10X stock solution, then diluted as needed.

Concentrations greater than 1X may appear hazy. This will not affect the performance of the inhibitors. These solutions should be mixed until uniformly suspended.

References

1. Bilbrough T et al., Dissecting the role of protein phosphorylation: a chemical biology toolbox. *Chem Soc Rev.* 2022; 51(13):5691-5730.
2. Singh V et al., Phosphorylation: Implications in Cancer. *Protein J.* 2017; 36(1):1-6.
3. Chen J et al., Positive selection-driven fixation of a hominin-specific amino acid mutation related to dephosphorylation in IRF9. *BMC Ecol Evol.* 2022; 22(1):132.
4. Rietz A et al., The relationship between the MMP system, adrenoceptors and phosphoprotein phosphatases. *Br J Pharmacol.* 2012; 166(4):1225-43.
5. Heft Neal ME et al., Advancement of PI3 Kinase Inhibitor Combination Therapies for PI3K-Aberrant Chordoma. *J Neurol Surg B Skull Base.* 2020; 83(1):87-98.
6. Valdiglesias V et al., Okadaic acid: more than a diarrheic toxin. *Mar Drugs.* 2013; 11(11):4328-49.
7. Sineshchekov V et al., The phosphatase/kinase balance affects phytochrome A and its native pools, phyA' and phyA'', in etiolated maize roots: evidence from the induction of phyA' destruction by a protein phosphatase inhibitor sodium fluoride. *Photochem Photobiol Sci.* 2021; 20(11):1429-1437.
8. Somerville LL et al., Sarcomere matrix of striated muscle: in vivo phosphorylation of titin and nebulin in mouse diaphragm muscle. *Arch Biochem Biophys.* 1988; 262(1):118-29.
9. Rana D, Kumar A. Is there a Role for Sodium Orthovanadate in the Treatment of Diabetes? *Curr Diabetes Rev.* 2019; 15(4):284-287.
10. Li L et al., Protein tyrosine phosphorylation in signaling pathways leading to the activation of gelatinase A: activation of gelatinase A by treatment with the protein tyrosine phosphatase inhibitor sodium orthovanadate. *Biochim Biophys Acta.* 1998; 1405(1-3):110-20.

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