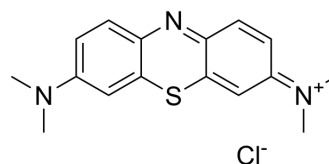


Methylene Blue

Cat. No.:	HY-14536
CAS No.:	61-73-4
Molecular Formula:	C ₁₆ H ₁₈ ClN ₃ S
Molecular Weight:	320
Target:	Guanylate Cyclase; Monoamine Oxidase; NO Synthase; Microtubule/Tubulin
Pathway:	GPCR/G Protein; Neuronal Signaling; Immunology/Inflammation; Cell Cycle/DNA Damage; Cytoskeleton
Storage:	4°C, sealed storage, away from moisture and light * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture and light)



SOLVENT & SOLUBILITY

In Vitro	H ₂ O : 50 mg/mL (156.25 mM; Need ultrasonic)					
		Solvent Concentration	Mass			
	Preparing Stock Solutions			1 mg	5 mg	10 mg
		1 mM		3.1250 mL	15.6250 mL	31.2500 mL
		5 mM		0.6250 mL	3.1250 mL	6.2500 mL
	10 mM		0.3125 mL	1.5625 mL	3.1250 mL	
Please refer to the solubility information to select the appropriate solvent.						

BIOLOGICAL ACTIVITY

Description	Methylene blue (Basic Blue 9) is a guanylyl cyclase (sGC), monoamine oxidase A (MAO-A) and NO synthase (NOS) inhibitor. Methylene blue is a vasopressor and is often used as a dye in several medical procedures. Methylene blue through the nitric oxide synthase/guanylate cyclase signalling pathway to reduce prepulse inhibition. Methylene blue is a REDOX cycling compound and able to cross the blood-brain barrier. Methylene blue is a Tau aggregation inhibitor. Methylene blue reduces cerebral edema, attenuated microglial activation and reduced neuroinflammation ^{[1][2][3]} .
IC₅₀ & Target	Guanylyl cyclase (sGC) ^[1] . Monoamine oxidase A (MAO-A) ^[1] . NO synthase (NOS) ^[1]
In Vitro	Methylene blue (Basic Blue 9) (4.5 μM; BV2 microglia) alters the immune profile of LPS-activated BV2 microglia and decreases the level of CD14, IL-1β, TNF-α, and CCL2 mRNA ^[3] . MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Methylene blue (Basic Blue 9) (50 and 100 mg/kg; i.p.; once, for 25 min; male NMRI mice) reduces absent prepulse inhibition

[1].

?Methylene blue (Basic Blue 9) (20 and 40 mg/kg; p.o.; daily, for 6 months; CaMKII α -tTA transactivator mice) preserves cognition in mice expressing full-length pro-aggregant human Tau^[2].

?Methylene blue (Basic Blue 9) (2 mg/kg; i.v.; once, for 1 d; TBI-treated male BALB/c mice) reduces TBI-induced edema and neuroinflammation and reduces acute depression-like behavior^[3].

?Methylene blue (Basic Blue 9) (2 mg/kg; i.v.; once, for 1 d; TBI-treated male BALB/c mice) reduces the percentage of inflammatory factor^[3].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Male NMRI mice ^[1]
Dosage:	50 and 100 mg/kg
Administration:	Intraperitoneal injection; once, for 25 minutes
Result:	Reduced the prepulse inhibition and reduced the increase in locomotor activity caused by phencyclidine (PCP).

Animal Model:	CaMKII α -tTA transactivator mice ^[2]
Dosage:	20 and 40 mg/kg
Administration:	Oral administration; daily, for 6 months
Result:	Inhibited Tau aggregation in CaMKII α -tTA transactivator mice.

Animal Model:	TBI-treated male BALB/c mice ^[3]
Dosage:	2 mg/kg
Administration:	Intravenous injection; once, for 1 day
Result:	Decreased the level of CD14, IL-1 β , TNF- α , and CCL2 mRNA.

Animal Model:	TBI-treated male BALB/c mice ^[3]
Dosage:	2 mg/kg
Administration:	Intravenous injection; once, for 1 day
Result:	Reduced the percentage of myeloid (CD11b+/GR1+) cells, reduced IL-1 β and enhanced IL-10 expression in microglia.

CUSTOMER VALIDATION

- Biomaterials. 2022: 121988.
- Theranostics. 2021 Oct 17;11(20):9884-9903.
- Redox Biol. 2020 Sep;36:101601.
- Cell Rep. 2024 Feb 13;43(2):113779.
- Phytother Res. 2023 Feb 14.

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REFERENCES

- [1]. Klamer D, et, al. Phencyclidine-induced behaviour in mice prevented by methylene blue. *Basic Clin Pharmacol Toxicol*. 2004 Feb;94(2):65-72.
- [2]. Hochgräfe K, et, al. Preventive methylene blue treatment preserves cognition in mice expressing full-length pro-aggregant human Tau. *Acta Neuropathol Commun*. 2015 May 10;3:25.
- [3]. Fenn AM, et, al. Methylene blue attenuates traumatic brain injury-associated neuroinflammation and acute depressive-like behavior in mice. *J Neurotrauma*. 2015 Jan 15;32(2):127-38.
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Caution: Product has not been fully validated for medical applications. For research use only.

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