

PRODUCT INFORMATION



TNP-GTP (sodium salt)

Item No. 38570

Formal Name: 2',3'-O-(2,4,6-trinitro-2,4-cyclohexadien-1-ylidene)-guanosine 5'-(tetrahydrogen triphosphate), tetrasodium salt

Synonym: TNP-Guanosine 5'-triphosphate

MF: $C_{16}H_{13}N_8O_{20}P_3 \cdot 4Na$

FW: 822.2

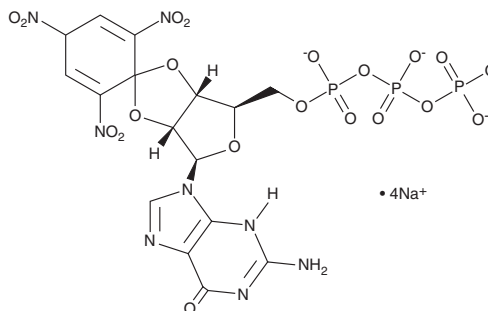
Purity: $\geq 95\%$

Ex./Em. Max: 470/552 nm

Supplied as: A solution in water

Storage: $-80^\circ C$

Stability: ≥ 4 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Description

TNP-GTP is a fluorescent derivative of the energy substrate for protein synthesis and gluconeogenesis, guanosine 5'-triphosphate (GTP; Item No. 16060).¹ It displays an emission maximum of 552 nm upon excitation at 410 nm in water, with fluorescence increasing in intensity and shifting to 544 and 532 nm in 40 and 80% N,N-dimethylformamide, respectively, which is less polar than water.¹ TNP-GTP is an inhibitor of glutamate dehydrogenase ($K_i = 2.7 \mu M$). When bound to glutamate dehydrogenase, the fluorescence intensity of TNP-GTP is increased and the emission shifts from 552 to 545 nm, an effect that can be blocked by addition of GTP. TNP-GTP is an antagonist of the purinergic $P2X_2$ and $P2X_{2/3}$ receptors ($IC_{50}s = 0.4$ and $1.2 nM$, respectively).² It also selectively inhibits rat soluble guanylyl cyclase (sGC; $K_i = 11 nM$) over bovine liver glutamate dehydrogenase (GDH; $K_i = 2.7 \mu M$) and the calmodulin-dependent *B. pertussis* adenylyl cyclase (AC) toxin ($K_is = 20$ and $320 \mu M$ in the presence of manganese or magnesium, respectively).^{1,3,4}

References

1. Hiratsuka, T. A chromophoric and fluorescent analog of GTP, 2',3'-O-(2,4,6-trinitrocyclohexadienylidene)-GTP, as a spectroscopic probe for the GTP inhibitory site of liver glutamate dehydrogenase. *J. Biol. Chem.* **260**(8), 4784-4790 (1985).
2. Virginio, C., Robertson, G., Surprenant, A., et al. Trinitrophenyl-substituted nucleotides are potent antagonists selective for $P2X_1$, $P2X_3$, and heteromeric $P2X_{2/3}$ receptors. *Mol. Pharmacol.* **53**(6), 969-973 (1998).
3. Dove, S., Danker, K.Y., Stasch, J.-P., et al. Structure/activity relationships of (M)ANT- and TNP-nucleotides for inhibition of rat soluble guanylyl cyclase $\alpha_1\beta_1$. *Mol. Pharmacol.* **85**(4), 598-607 (2014).
4. Göttle, M., Dove, S., Steindel, P., et al. Molecular analysis of the interaction of *Bordetella pertussis* adenylyl cyclase with fluorescent nucleotides. *Mol. Pharmacol.* **72**(3), 526-535 (2007).

WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

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