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Technical Information about 8-Nitroguanosine

Potential indicator of nitric oxide-induced RNA damage

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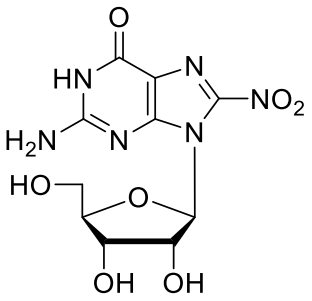

Abbreviation: **8-NO_2-Guo**

Formula	CAS No.	Molecular Weight	UV	BIOLOG Cat. No.
$C_{10}H_{12}N_6O_7$	[337536-53-5]	328.3	λ_{max} 390 nm / ε 4100 / pH 7	N 004

Name: 8- Nitroguanosine

Description: 8- Nitroguanosine is an analogue of the purine nucleoside guanosine where the hydrogen in position 8 is replaced by a nitro group.

Properties:

- **Potential indicator of nitric oxide-induced RNA damage**
- **Reference for analysis of nitric oxide stressed RNA fragments**

8-Nitroguanosine is one of the breakdown products from reaction of RNA with peroxynitrite. Therefore, its presence could be evidence for damages caused by this highly reactive and strong oxidant. Peroxynitrite is formed by reaction of nitric oxide with superoxide, e.g. in inflamed tissues.

Specification: Crystallized or lyophilized yellow to red solid. The corresponding nucleobase, 8-nitroguanine, is offered as well (Cat. No. N 003). For other structures related to 8-nitroguanosine, please inquire. Please keep in mind that equal concentrations of the compound may look different in volume. Micromolar quantities are determined by weight.

Purity: Typical analysis is better than 95% (HPLC / UV 390 nm). The product is not sterile and has not been tested for endotoxins.

Solubility: 8-Nitroguanosine has limited solubility in water. However, a solution of at least 4 mM can be obtained at room temperature. Please rinse tube walls carefully and preferably use ultrasonic or vortex to achieve total and uniform mixing. When opening the tube please make sure that no substance is lost within the cap.

Stability and Storage: 8-Nitroguanosine is relatively stable under conditions of biological systems and media, however, it can develop some 8-nitroguanine upon storage. The compound should be protected from light and stored frozen.

Toxicity and Safety: Since guanosine has multiple tasks in every organism, it is very likely that its analogues will interfere with many cell regulation processes *in vivo*. However, due to the rather small quantities to work with, no health hazards have been reported. Nevertheless please keep in mind, that the *in vivo* properties of this compound are not sufficiently characterized up to now. Avoid skin contact or ingestion and allow only trained personnel to handle the product.
Our products are designed, developed and sold for research purposes only! They are intended for *in vitro* and nonhuman *in vivo* laboratory applications. Any other use requires approval of health authorities.
Not for drug, household or related uses!

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Selected References for 8-Nitroguanosine:

Ahtesham, A.K.; Sawa, T.; Akaike, T., *Amino Acids*, **41**, 123 - 130 (2011): "Protein Cysteine S-guanylation and Electrophilic Signal Transduction by Endogenous Nitro-nucleotides"

Yoshitake, J.; Katsuaki, K.; Yoshioka D.; Sueishi, Y.; Sawa, T.; Akaike, T.; Yoshimura, T., *Nitric Oxide*, **18**, 223 - 228 (2008): “Suppression of NO Production and 8-nitroguanosine Formation by Phenol-containing Endocrine-disrupting Chemicals in LPS-stimulated Macrophages: Involvement of Estrogen Receptor-dependent or Independent Pathways”

Kaneko, K.; Akuta, T.; Sawa, T.; Kim, H.W.; Fujii, S.; Okamoto, T.; Nakayama, H.; Ohigashi, H.; Murakami, A.; Akaike, T., *Cancer Letters*, **262**, 239 - 247 (2008): “Mutagenicity of 8-nitroguanosine, a product of Nitrative Nucleoside Modification by Reactive Nitrogen Oxides, in Mammalian Cells”

Saito, Y.; Taguchi, H.; Fujii, S.; Sawa, T.; Kida, E.; Kabuto, C.; Akaike, T.; Arimoto, H., *Chem. Commun*., 5984 - 5986 (2008): "8-Nitroguanosines as Chemical Probes of the Protein S-guanylation"

Akuta, T.; Zaki, M.H.; Yoshitake, J.; Okamoto, T.; Akaike, T., *Nitric Oxide*, **14**, 101 - 108 (2006): "Nitrative Stress through Formation of 8-Nitroguanosine: Insights into Microbial Pathogenesis"

Yoshitake, J.; Akaike, T.; Akuta, T.; Tamura, F.; Ogura, T.; Esumi, H.; Maeda, H., *J. Virol.*, **78**, 8709 - 8719 (2004): "Nitric Oxide as an Endogenous Mutagen for Sendai Virus without Antiviral Activity"

Masuda, M.; Nishino, H.; Ohshima, H., *Chemico-Biological Interactions*, **139**, 187 - 197 (2002): "Formation of 8-Nitroguanosine in Cellular RNA as a Biomarker of Exposure to Reactive Nitrogen Species"

Tretyakova, N.Y.; Burney, S.; Pamir, B.; Wishnok, J.S.; Dedon, P.C.; Wogan, G.N.; Tannenbaum, S.R., *Mutat. Res.-Fundam. Mol. Mech. Mut.*, **447**, 287 - 303 (2000): "Peroxynitrite-induced DNA Damage in the supF Gene: Correlation with the Mutational Spectrum"

Yermilov, V.; Rubio, J.; Becchi, M.; Friesen, M.D.; Pignatelli, B.; Ohshima, H., *Carcinogenesis*, **16**, 2045 - 2050 (1995): "Formation of 8-Nitroguanine by the Reaction of Guanine with Peroxynitrite in vivo"

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