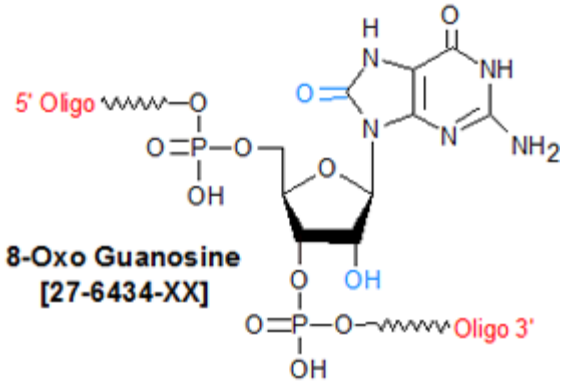
8-Oxo rG [8-Oxo-rG]

Category	Structural Studies
Modification Code	8-Oxo-rG
Reference Catalog Number	27-6434
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	361.21



8-Oxo-riboguanosine (8-Oxo-G) is classified as an oxidized ribonucleotide, and is primarily used in studies of oxidative RNA damage and associated RNA repair and RNA turnover mechanisms within the cell. In the cell, 8-Oxo-G RNA lesions are formed by reaction with reactive oxygen species (ROS) generated either via normal oxidative metabolic processes, UV ionizing radiation, or exposure to oxidative agents such as hydrogen peroxide, ethanol, ammonia and 2-nitropropane (an industrial solvent) (1,2). Oxidative RNA damage can lead to defects in protein synthesis, for example, decreased rates of protein synthesis and production of aggregated or truncated peptides (3,4), with important implications in aging and neurodegenerative disorders and artherosclerosis (5,6). Current understanding of cellular repair and turnover mechanisms for RNA 8-Oxo-G lesions is reviewed in reference 1. **References**

1. Wurtmann, E.J., Wolin, S.L. RNA under attack: Cellular handling of RNA damage. *Crit. Rev. Biochem. Mol. Biol.* (2009), **44**: 34-49.
2. Cadet J., Douki, T., Badouard, C., Favier, A., Ravanat-J.L. Oxidatively generated damage to cellular DNA: mechanistic aspects. *In: Oxidative Damage to Nucleic Acids (Evans, M.F., Cooke, M.S., ed.),* Landes Bioscience; Austin, TX (2007), pp.1-13.
3. Shan, X., Chang, Y., Lin, C.G. Messenger RNA oxidation is an early event preceding cell death and causes reduced protein expression.*FASEB J.* (2007), **21**: 2753-2764.
4. Tanaka, M., Chock, P.B., Stadtman, E.R. Oxidized messenger RNA induces translation errors. *Proc. Natl. Acad. Sci. USA* (2007), **104**: 66-71.
5. Nunomura, A., Honda, K., Takeda, A., Hirai, K., Zhu, X., Smith, M.A., Perry, G. Oxidative Damage to RNA in neurodegenerative diseases.*J. Biomed. Biotechnol.* (2006), **2006**: 1-6.
6. Martinet, W., de Meyer, G.R.Y., Herman, A.G., Kockx, M.M. Reactive oxygen species induce RNA damage in human atherosclerosis. *Eur. J. Clin. Invest.* (2004), **34**: 323-327.