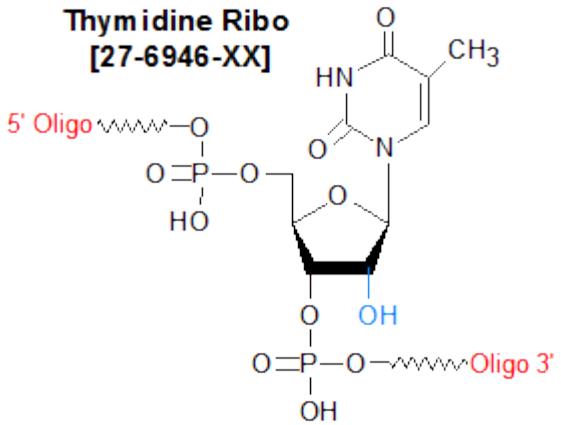
Thymidine Ribo

Category	Minor Bases
Modification Code	rT
Reference Catalog Number	27-6946
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	321.07



Thymidine Ribo (ribothymidine (rT), 5-methyl-rU) is the ribonucleotide version of thymidine, and is used to modify structural RNA, especially tRNA, for use in enzyme-RNA structural and kinetics studies. Ribothymidine is the most common methylated ribonucleoside found in prokaryotic tRNA, typically at the 23rd position from the 3'-end in the nucleotide sequence G-T-PseudoU-C-Purine (1). By contrast, in eukaryotic 'class D' tRNAs, unmodified uridine is always found at that position; the presence of rT there reduces protein synthesis efficiency in vitro (2). Roe and Tsen found that, for 'class C' mammalian tRNAs, that is, tRNAs having varying amounts of rT and U at position 23, the rate and extent of protein synthesis are proportional to the rT content of the tRNA, with an increase in rT leading to a proportional increase in the Vmax of the synthesis reaction (3). A recent review of work involving rT-modified RNA substrates is found in (4). **References**

1. Kim, S.H., Sussman, J.L., Suddath, F.L., Quigley, G.S., McPherson, A., Wang, A.M.J., Seeman, M.C., Rich, A. The general structure of transfer RNA molecules. *Proc. Natl. Acad. Sci. USA* (1974), **71**: 4970-4974.
2. Marcu, K.B., Dudock, B.S. Effect of ribothymidine in specific eukaryotic tRNAs on their efficiency in in vitro protein synthesis.*Nture* (1976), **261**: 159-162.
3. Roe, B.A., Tsen, H.Y. Role of ribothymidine in mammalian tRNAPhe *Proc. Natl. Acad. Sci. USA* (1977), **74**:3696-3700.
4. Hur, S., Stroud, R.M., Finer-Moor, J. Substrate Recognition by RNA 5-Methyluridine Methyltransferases and Pseudouridine Synthases: A Structural Perspective. *J. Biol. Chem.* (2005), **281**:38969-38973.