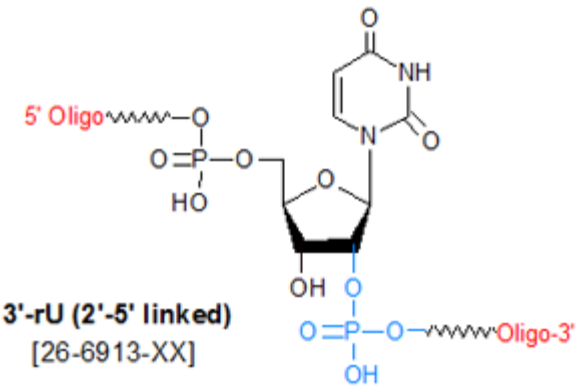
Oligo Modifications

3'-rU (2'-5' linked)

Category	Minor Bases
Modification Code	3rU2-5
Reference Catalog Number	26-6913
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	306.17



3'-rU (2'-5' linked)
[26-6913-XX]

3'-ribouridine (3'-rU)-(2'-5' linked), and the other three 3'-ribonucleotide (2',5'-linked) modifications are used to substitute 2'-5' phosphodiester linkages for the usual 3'-5' phosphodiester linkages at some or all positions of an oligonucleotide. Oligonucleotides containing all, or primarily, 2',5'-phosphodiester linkages selectively bind to complementary single-stranded 3',5'-RNA over comparable 3',5'-DNA (1). Presumably this selectively is a consequence of the 2',5'-linkages destabilizing duplexes formed with 3',5'-DNA more than those formed with 3',5'-RNA, leading to 2'5'-RNA:3',5'-DNA duplexes having much lower Tm than the corresponding 2'5'-RNA:3',5'-RNA duplexes. This property means that RNA oligos containing such linkages could be useful in anti-sense applications, as ssRNA-specific probes, or as ligands for affinity purification of cellular RNA.

A interesting application of the 3'-rA-(2',5'-linked) modification is as an activator for 2-5A dependent RNAse to direct it to cleave unique RNA sequences (2). In this approach, the 5'-phosphorylated, 2',5'-linked tetramer p5'A2'p5'A2'p5'A2'p5'A (abbreviated "2-5A" as covalently linked to anti-sense oligo, resulting in the chimera (2-5A:AS). The AS sequence of 2-5A:AS bound to a particular ssRNA target sequence, and he 2-5A activator sequence activated 2-5A-dependent RNA, causeing it to cleave the target after UpUp and UpA motifs. Selectively targeted destruction of ssRNA in vivo via this approach has potential applications for therapeutic control of gene expression in such diseases as cancer, viral infections, and certain genetic disorders. **References**

1. Giannaris, P.A.; Damha, M.J. Oligoribonucleotides containing 2',5'-phosphodiester linkages exhibit binding selectivity for 3',5'-RNA over 3',5'-ssDNA. *Nucleic Acids Res* (1993), **21**: 4742-4749.
2. Torrence, P.F.; Maitra, R.K.; Lesiak, K.; Khamnei, S.; Zhou, A.; Silverman, R.H. Targeting RNA for degradation with a (2'-5') oligoadenylate-antisense chimera. *Proc. Natl. Acad. Sci. USA* (1992), **90**: 1300-1304.