**Product Specifications**

Custom Oligo Synthesis, antisense oligos, RNA oligos, chimeric oligos, Fluorescent dyes, Affinity Ligands, Spacers & Linkers, Duplex Stabilizers, Minor bases, labeled oligos, Molecular Beacons, siRNA, phosphonates

Locked Nucleic Acids (LNA); 2′-5′ linked Oligos

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**Oligo Modifications**

For research use only. Not for use in diagnostic procedures for clinical purposes.

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### Methyl Phosphonate

<table>
<thead>
<tr>
<th>Category</th>
<th>Nuclease Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modification Code</td>
<td>mp-dN</td>
</tr>
<tr>
<td>Reference Catalog Number</td>
<td>26-6510</td>
</tr>
<tr>
<td>5 Prime</td>
<td>Y</td>
</tr>
<tr>
<td>3 Prime</td>
<td>Y</td>
</tr>
<tr>
<td>Internal</td>
<td>Y</td>
</tr>
<tr>
<td>Molecular Weight (mw)</td>
<td>306</td>
</tr>
</tbody>
</table>

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Methyl Phosphonate modification has a setup charge of $250.00 per order for special synthesis reagents.

**Methyl phosphonate (mp) modification makes the phosphodiester linkage neutral charged. The solubility of the oligo in aqueous solutions slowly decreases with increasing mp linkages; consider incorporating as many standard phosphodiester linkages as well in the oligo. Increasing percentage of DMSO from 0.5 to 10% may be used to solubilize the oligo.**

Methyl phosphonamidites are deoxynucleoside amidites modified such that, when incorporated into an oligonucleotide, that base position will have a (electrically neutral) methyl phosphate backbone linkage instead of the standard (negatively charged) phosphodiester linkage. Oligos containing one or more methyl phosphate linkages will be resistant to nuclease degradation at those positions, and the lack of charge improves intracellular transport. Because of these properties, methyl phosphonolated oligos have been explored as anti-sense reagents (1). However, since methyl phosphate linkages lower the oligo’s cellular uptake (2) as well as the Tm of the duplex formed with its RNA target (3), and, most importantly, also interfere with activation of RNase H activity (4), considerable care must taken in choosing which, and how many, methyl phosphate linkages to incorporate into a putative anti-sense oligo. In that regard, we note that 2′-O-Methyl RNA oligos containing a single 3′-end methyl phosphate “cap” (to eliminate 3′-exonuclease degradation) have been successfully used as anti-sense reagents (5). In addition, DNA extension primers containing such a “cap” have been used to characterize the nuclease activity of the yeast telomerase complex (6). Methylphosphonolated anti-sense oligos have also been used successfully to “mask” sites in U1 and U2 snRNPs required for spliceosome formation, and thus interfere with mRNA splicing (7). Many of the unique properties of methylphosphonolated oligos are due to the introduction of chirality into the phosphodiester backbone by the methyl group (8). **References**

2. Blake, K.


