



## Product Specifications

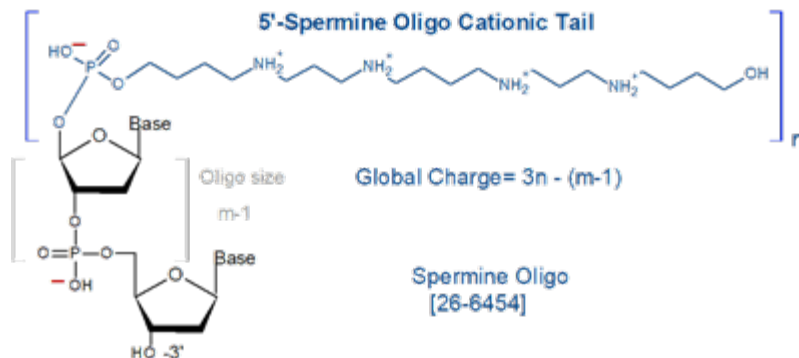
Custom Oligo Synthesis, antisense oligos, RNA oligos, chimeric oligos, Fluorescent dyes, Affinity Ligands, Spacers & Linkers, Duplex Stabilizers, Minor bases, labeled oligos, Molecular Beacons, siRNA, phosphonates Locked Nucleic Acids (LNA); 2'-5' linked Oligos

## Oligo Modifications

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

### Spermine Oligo

|                          |                  |
|--------------------------|------------------|
| Category                 | Duplex Stability |
| Modification Code        | Spm              |
| Reference Catalog Number | 26-6454          |
| 5 Prime                  | Y                |
| 3 Prime                  | Y                |
| Internal                 | Y                |
| Molecular Weight(mw)     | 408.52           |



Spermine phosphoramidite is used to produce oligospermine-oligonucleotide conjugates - Zip Nucleic Acids (ZNA®) Oligos. The name reflects the presumed mode of action. The conjugates are believed to use the oligospermine to seek out and move along (scan) oligonucleotide strands until the probe complementary sequence is located. The oligospermine then performs the function of stabilizing the formed duplex by reducing electrostatic repulsion, thereby leading to significantly increased binding affinities. ZNA® Oligos have found use in the following applications: Multiplex PCR; PCR of AT-rich Regions; RT qPCR; Detection of MicroRNA; Improved SNP Discrimination; and Antisense and Antigenic Effects. Spermine phosphoramidite is simple to use in oligonucleotide synthesis and can be added multiple times at the 3' or 5' terminus. Deprotection and isolation are also straightforward. HPLC analysis of the conjugates requires high pH to suppress the ionization of the spermine residues.

By selecting the number of cationic units, the global charge of the ZNA molecules can be modulated which defines their field of applications. When negatively charged, ZNA are potent tools for molecular biology and diagnostic applications. Their design is essentially based on the expected and predictable  $T_m$  of the oligonucleotide which depends on the number of conjugated cationic units. When positively charged, the cationic conjugates become self-delivering oligonucleotides into cells and resistant to nucleases which make them very attractive molecules for antisense or RNA interference applications. With an increase in spermine content, the solubility of ZNA® oligonucleotides may be noticeably less than unmodified DNA or RNA counterparts. This is typically observed when re-dissolving dried-down purified ZNA® in water. In this case, dropwise addition of 50 mM ammonium hydroxide brings ZNA® molecules into solution. Alternatively, dissolving ZNA® oligos in concentrated phosphate buffered saline (2.5x PBS, pH 7.4) has also been found to resolve solubility issues.

#### Recommended Further Reading

Glen Reports GR24-11. Spermine Phosphoramidite: A potent modification with many applications.

Glen Reports GR24-11. Zip Nucleic Acids (ZNA®) are powerful cationic oligonucleotides for molecular biology, diagnostic and therapeutic applications.

#### INTELLECTUAL PROPERTY

"Spermine phosphoramidite" synthon is the subject matter of U.S. Patent Application No. 12/086.599, European Patent Application No. EP20060847298 and foreign equivalents for which Polyplus-transfection is the co-owner. Product is sold for research purposes only. Product shall not be used to manufacture oligonucleotide-oligospermine conjugates for use in diagnostics, clinical or commercial applications including use in humans. There is no implied license to manufacture oligospermine-oligonucleotide conjugates for diagnostic, clinical or commercial applications, including but not limited to contract research. Please contact Polyplus-transfection at [licensing@polyplus-transfection.com](mailto:licensing@polyplus-transfection.com) to obtain a license for such use.