



## 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.

#### DNP TEG (2, 4-dinitrophenyl)

Category Affinity Ligands

Modification Code DNP-TEG

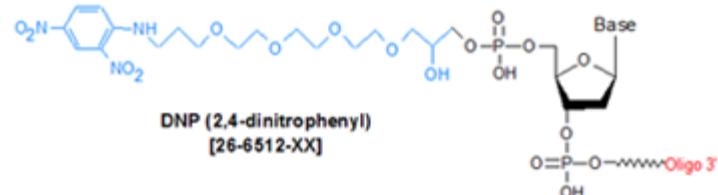
Reference Catalog Number 26-6512

5 Prime Y

3 Prime Y

Internal Y

Molecular Weight(mw) 509.41



DNP (2,4-dinitrophenyl) is classified as a hapten for molecular biology purposes, that is, a small molecule having high immunogenicity. Because antibodies raised against haptens have considerably higher affinities for them than other antibodies do for their targets makes haptens particularly desirable as affinity tags for oligonucleotides (1).

DNP attached to a triethylene glycol (TEG) spacer arm is commonly used to label oligonucleotides probes for use in hybridization applications, for example, in situ hybridization, Northern and Southern blotting (2). After hybridization to their targets, these DNP-labeled probes are detected with anti-DNP antibodies that are labeled with dyes (for primary detection) or enzymes (for secondary detection using a fluorogenic, chemiluminogenic, or colorimetric (3) substrate specific for the enzyme). To maximize signal obtained with such probes, Gene Link recommends modifying the oligonucleotide probe with three DNP molecules, either grouped at the 5'-end or spaced about 10 bases apart (2).

In addition to the above straightforward anti-DNP antibody-based detection systems, oligo probes labeled with both a fluorescent dye and DNP also been used for highly-sensitive direct detection of antigens (at femtoMolar levels) in a rolling circle amplification (RCA)-based assay system (4). **References**

1. Shreder, K. Synthetic Haptens as Probes of Antibody Response and Immunorecognition. *Methods (Academic Press)* (2000), **20**: 372-379.
2. Grzybowski, J., Will, D.W., Randall, R.E., Smith, C.A., Brown, T.. Synthesis and antibody-mediated detection of oligonucleotides containing multiple 2,4-dinitrophenyl reporter groups. *Nucleic Acids Res.* (1993), **21**: 1705-1712.
3. Lehtovaara, P., Uusi-Oukari, M., Buchert, P., Laaksonen, M., Bengtstrom, M. Ranki, M. Quantitative PCR for Hepatitis B Virus with Colorimetric Detection. *Genome Res.* (1993), **3**: 169-175.
4. Schweitzer, B., Wiltshire, S., Lambert, J., O'Malley, S., et al. Immunoassays with rolling circle DNA amplification: A versatile platform for ultrasensitive antigen detection. *Proc. Natl. Acad. Sci. (USA)* (2000), **97**: 10113-10119.