Product Specifications

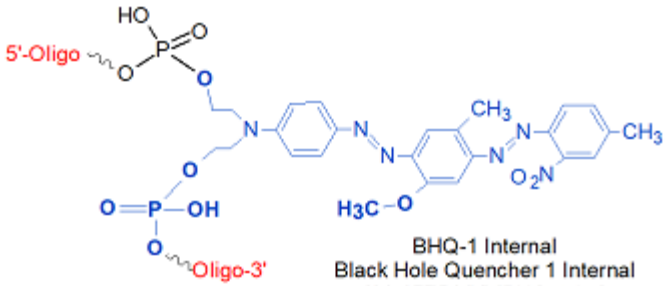
Custom Oligo Synthesis, antisense oligos, RNA oligos, chimeric oligos, Fluorescent dyes, Affinity Ligands, Spacers & Linkers, Duplex Stabilizers, Minor bases, labeled oligos, Molecular Beacons, siRNA, phosphonates Locked Nucleic Acids (LNA); 2′-5′ linked Oligos

Oligo Modifications

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

BHQ-1 Internal

Category	Quenchers
Modification Code	BHQ-1-Int
Reference Catalog Number	26-6775
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	538.47



BHQ-1 Internal
Black Hole Quencher 1 Internal
[26-6775-XX] [BHQ-1-Int]

Black Hole Quencher-1 (BHQ-1) is classified as a dark quencher (a non-fluorescent chromophore), and is extensively used as the 3'-quencher moiety in a variety of Fluorescence Resonance Energy Transfer (FRET) DNA detection probes. Such probes are primarily used in nucleic acid assays, but also find a place in nucleic acid structural studies (1). Examples include TaqMan probes (2), Scorpion primers (3), and Molecular Beacons (4).

BHQ-1 has an absorbance maximum of 534 nm, and an effective absorbance range of 480-580 nm. It is the preferred quencher for pairing with fluorescent dyes that emit in theyellow-green to yellow part of the visible range (519-556 nm). The emission spectra of this set of dyes sufficiently overlaps the absorbance spectrum of BHQ-1 to allow the latter to quench the fluorescence of the former with a high degree of efficiency.

The advantages of using a dark quencher in a FRET probe are (a) low background fluorescence (and thus better signal-to-noise ratio), (b) higher dynamic range, (c) amenability to multiplex assays (due to a dark quencher having no secondary fluorescence), and (d) ease of synthesis of FRET probes with a dark quencher (due to dark quenchers being resistant to degradation during the oligo deprotection step) (5).

Click here for list of quenchers.

Click here for a list of fluorophores.
Quencher Spectral Data

Quencher

Absorption Max, nm

Quenching Range, nm Dabcyl 453 380-530 BHQ-0 495 430-520 BHQ1 534 480-580 BHQ2 579 550-650 BHQ3 672 620-730 BBQ-650 650 550-750

genelink.com/oligo_modifications_reference/OMR_mod_category_intro.asp?mod_sp_cat_id=15">Click here for complete list of quenchers and details **Black Hole Quencher License Agreement

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References

1. Didenko, V.V. DNA Probes Using Fluorescence Resonance Energy Transfer (FRET): Designs and Applications. *Biotechniques* (2001), **31**: 1106-1121.
2. Livak, K.J., Flood, S.J.A., Marmaro, J., Giusti, W., Deetz, K. Oligonucleotides with fluorescent dyes at opposite ends provide a quenched probe system useful for detecting PCR product and nucleic acid hybridization.*PCR Methods Appl.* (1995), **4**: 1-6.
3. Thelwell, N., Millington, S., Solinas, A., Booth, J., Brown, T. Mode of action and application of Scorpion primers to mutation detection. *Nucleic Acids Res.* (2000), **28**: 3752-3761.
4. Tyagi, S., Kramer, F.R. Molecular beacons: probes that fluoresce upon hybridization. *Nat. Biotechnol.* (1996), **14**: 303-308.
5. Yeung, A.T., Holloway, B.P., Adams, P.S., Shipley, G.L. Evaluation of dual-labeled fluorescent DNA probe purity versus performance in real-time PCR. *Biotechniques.* (2004), **36**: 266-270, 272, 274-275.