Cy7.5 NHS

Category	Fluorescent Dyes
Modification Code	Cy7.5-N
Reference Catalog Number	26-6498
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	664.91

Cy7.5 modification is a post synthesis conjugation to a primary amino group thus an additional modification with an amino group is required. A C6 or C12 amino group can be placed at the 5' or for the 3' end a C3 or C7 amino and for internal positions an amino modified base is used, e.g Amino dT C6. **YIELD** NHS based modifications are post synthesis conjugation performed using a primary amino group. The yield is lower as compared to direct automated coupling of modifications that are available as amidites. Approximate yield for various scales are given below.
~2 nmol final yield for 50 nmol scale synthesis.
~5 nmol final yield for 200 nmol scale synthesis.
~16 nmol final yield for 1 umol scale synthesis
~160 nmol final yield for 10 umol scale synthesis
~240 nmol final yield for 15 umol scale synthesis

Cyanine 7.5 (Cy7.5) NHS ester is a fluorescent dye that belongs to the Cyanine family of synthetic polymethine dyes. Cy7.5 is reactive, water-soluble, and has an absorbance maximum of 788 nm and an emission maximum of 808 nm, which is in the near IR. It is available as an NHS ester, and is used to fluorescently label oligonucleotides at either the 5' or 3' end, or internally. As a near IR dye, Cy7.5 has very little background fluorescence associated with it (1). It is thus an excellent choice for labeling oligo probes slated for in vivo applications, because the minimal scattering and absorption of near-IR photons by cellular tissue ensures higher S/N ratio, and better sensitivity. For example, Fluorescent Resonance Energy Transfer (FRET) oligonucleotide duplexes using Cy5.5 as the donor on one strand and Cy7.5 as the acceptor on the complementary strand have been used to detect and characterize transcription factor NF-kappaB p50 protein binding to DNA (2)

Caution: Cy7.5 is intensely colored and very reactive. Care should be exercised when handling the vial containing the C7.5-labeled oligo to avoid staining clothing, skin, and other items. Also, because Cy7.5 is in the form of an NHS ester, the oligo first must be synthesized with an Amino C6 Linker (for the ends) or the Amino C6 version of the base phosphoramidite (for internal labeling). The Cy7.5-NHS ester is then manually attached to the oligo through the amino group in a separate reaction post-synthesis.

Near Infrared Fluorophore Spectral Data & Quencher Selection Guide

Fluorophore Name

Excitation Max, nm +/-10

Emission Max, nm +/-10

Extinction Coefficient*

Color**

Quencher

genelink.com/newsite/products/mod_detail.asp?modid=27">Cy5 650 665 250,000

IRDye 650 NHS 650 665 230,000

AZ647 NHS 655 680 191,800

Cy5.5 684 710 198,000

IRDye 700 NHS 684 710 288,000

Cy7 NHS 740 773 199,000

IRDye 750 NHS 756 776 260,000

cy7.5 NHS 788 808 223,000

IRDye 800 NHS 795 819 240,000

*** Extinction coefficient at λ (max) in cm-1M-1. ** Typical emission color seen through the eyepiece of a conventional fluorescence microscope with appropriate filters. Near-IR region. Human vision is insensitive to light beyond ~650 nm; it is not possible to view near-IR fluorescent dyes.**

Click here for a list of fluorophores.

Click here for list of quenchers.

References

1. Benson, R.C., Kues, H.A. Absorption and Fluorescence Properties of Cyanine Dyes.*J. Chem. Eng. Data* (1977), 22: 379-383.

2. Zhang, S., Metelev, V., Tabatadze, D., Zamecnik, P.C., Bogdanov, A. Fluorescence resonance energy transfer in near-infrared fluorescent oligonucleotide probes for detecting protein-DNA interactions. *Proc. Nat. Acad. Sci. USA.* (2008), 105: 4156-4161.