Product Specifications

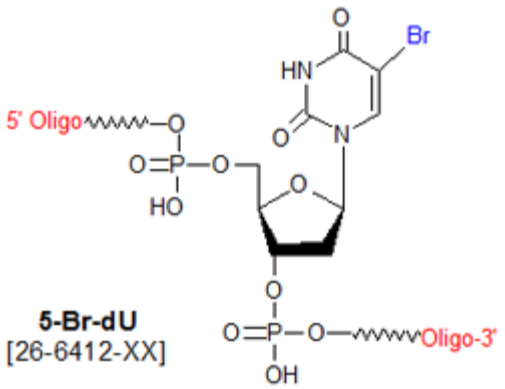
Custom Oligo Synthesis, antisense oligos, RNA oligos, chimeric oligos, Fluorescent dyes, Affinity Ligands, Spacers & Linkers, Duplex Stabilizers, Minor bases, labeled oligos, Molecular Beacons, siRNA, phosphonates Locked Nucleic Acids (LNA); 2′-5′ linked Oligos

Oligo Modifications

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

5-Br dU

Category	Minor Bases
Modification Code	5-Br-dU
Reference Catalog Number	26-6412
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	369.07



5-Br-dU
[26-6412-XX]

5-Bromo deoxyuridine (5-Br-dU) is classified as a halogenated nucleotide, and is primarily used to facilitate the determination of DNA structure by X-ray crystallography (1). When incorporated into a DNA molecule, the multi-wavelength anomalous dispersion (MAD) technique can be applied to obtain the phase information necessary to correctly calculate the electron density for the unit cell of the molecule under study. Because the MAD technique allows for the measurement of all the diffraction data with the same sample, is a much simpler to use than the traditional multiple isomorphous replacement (MIR) method for phase determination, which requires the synthesis of, and collection of diffraction data from, multiple heavy-atom isomorphic derivatives of the original molecule (2).

Halogenated nucleotides are also photo-labile, and can be used in UV-crosslinking experiments to investigate the structure of protein-DNA complexes. For example, substitution of 5-Br-dU for thymine into a 25-bp DNA duplex containing the EcoK1 restriction site AAC(N6) enabled UV-crosslinking of the duplex to the Specifity (S) sub-unit of the EcoK1 enzyme. The observation of crosslinking only between the 5-Br-dU complementary to the first adenine in the restriction site demonstrated close contact between the major groove at this sequence and the S subunit (3). In another structural study, single-stranded oligonucleotides in which 5-Br-dU was substituted for thymine at several positions was used to characterize the binding of Nuclear Factor BA1 with DNA (4).

5-Br-dU can also be used in conjugation with the photo-SELEX technique to generate photo-aptamers capable of cross-linking to their target (5). For example, photo-aptamers selected from a candidate nucleic acid mixture containing 5-Br-dU instead of thymine could subsequently be optimized by retaining only those 5-Br-dU capable of being photo-crosslinked to the target, replacing the rest with thymine. **References**

1. Hendrickson, W.; Ogata, C. Phase determination from multiwavelength anomalous diffraction measurements. *Meth. Enzymol.*. (1997), **276**: 494-523.
2. Walsh M.A.; Evans G.; Sanishvili R.; Dementieva I.; Joachimiak, A. MAD data collection - current trends. *Acta Cryst.* (1999), **D55**: 1726-1732.
3. Chen, A.; Powell, L.M.; Dryden, D.T.F.; Murray, N.E.; Brown, T. Tyrosine 27 of the specificity polypeptide of EcoK1 can be UV crosslinked to a bromodeoxyuridine-substituted DNA target sequence.

Nucleic Acids Res. (1995), **23**: 1177-1183.
4. Kardassis, D.; Zannis, V.I.; Cladaras, C. Purification and Characterization of the Nuclear Factor BA1. *J. Biol. Chem..* (1990), **265**: 21733-21740.
5. Gold, L.; Zichi, D.; Wilcox, S.K.; Schneider, D.J.; Nieuwlandt, D.; Carter, J. SELEX and PHOTOSELEX. (2009), (US2009/0098549).