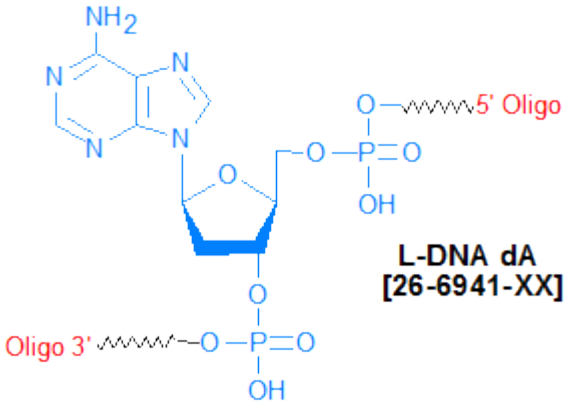
L-DNA dA

Category	Others
Modification Code	L-dA
Reference Catalog Number	26-6941
5 Prime	Y
3 Prime	Y
Internal	Y
Molecular Weight(mw)	313.2



L-DNA (beta stereoisomer deoxyribose that is same as in D-DNA)is the left-turning and mirror image version of natural DNA, as opposed to the naturally occurring right-turning version called D-DNA. L-DNA is more stable than D-DNA to enzymatic degradation by certain nucleases (1). Since the two enantiomers are identical in structure other than their chiral differences, their intrinsic physical properties are generally equal to each other. This includes duplex stability, solubility, and selectivity as D-DNA but form a left-helical double-helix. Because of its chiral difference, L-DNA does not bind to its naturally occurring D-DNA counterpart.

One important aspect of L-DNA is that it is poor at hybridizing to D-DNA (2). This confers multiple uses, one being that the incorporation of L-DNA into the stem of a molecular beacon as it allows stem invasion to be avoided (3). Other areas that it can play an important role in would be zip-code microarrays (2) and as molecular tags for PCR (4). When used in nanocarriers, L-DNA has greater cellular uptake as well as greater serum stability. It is good for also reducing interaction between aptamers and nanocarrier skeletons (5).

Gene Link synthesizes L-DNA oligos with any combination of D-DNA bases including fluorescent dyes and all other available modifications.

L-DNA Applications References

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2) Utilising the left-helical conformation of L-DNA for analysing different marker types on a single universal microarray platform Nicole C. Hauser, Rafael Martinez, Anette Jacob, Steffen Rupp, J”rg D. Hoheisel, Stefan Matysiak Nucleic Acids Res. 2006 October; 34(18): 5101-5111. Published online 2006 September 20. doi:ÿ10.1093/nar/gkl671
3) Superior structure stability and selectivity of hairpin nucleic acid probes with an L-DNA stem. Youngmi Kim, Chaoyong James Yang, Weihong Tan Nucleic Acids Res. 2007 December; 35(21): 7279?7287. Published online 2007 October 24. doi:ÿ10.1093/nar/gkm771
4) Hayashi G., Hagihara M., Nakatani K. Application of L-DNA as a molecular tag. Nucleic Acids Symp. Ser. 2005;49:261?262
5) Utilizing the bioorthogonal base-pairing system of L-DNA to design ideal DNA nanocarriers for enhanced delivery of nucleic acid cargos Kyoung-Ran Kim, Taemin Lee, Byeong-Su Kim and Dae-Ro Ahn.

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