Custom LNA Oligonucleotides

For experiments requiring custom-designed, LNA-enhanced oligonucleotides

- Customize your own LNA oligonucleotides
- Use your own design or let QIAGEN's LNA experts design them for you
- Select from a wide range of labels and modifications
- Benefit from the easy-to-use online design tool

Custom LNA Oligonucleotides are ideal for studies involving short or very similar sequences. The high affinity of an LNA-enhanced oligonucleotide to its complementary sequence results in dramatically improved specificity and sensitivity, when compared with traditional DNA or RNA oligos. In many cases, LNA-enhanced oligonucleotides can be used to distinguish between sequences differing by only a single nucleotide, a feature that can be critical for the success of many experiments.

Need a quote for your research project or would you like to discuss your project with our specialist team? **Just contact us!**

For Custom LNA Oligonucleotide Large Scale and Custom LNA Oligonucleotide Manual Design, please contact us for ordering and for further information, or email our Support Team directly.

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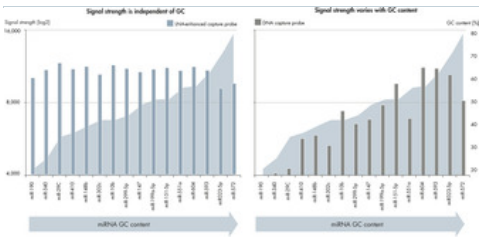

The power of T_m normalization.

Signal intensity from microarray experiments using LNA-enhanced or DNA-based capture probes. miRNA targets with varying GC content were added at 100 amol each. The signal from DNA-based capture probes varies with GC content and results in poor detection of many miRNAs, whereas LNA probes offer robust detection of all miRNAs.

Performance

LNA oligonucleotides exhibit unprecedented thermal stability when hybridized to a complementary DNA or RNA strand. For each incorporated LNA monomer, the melting temperature (T_m) of the duplex increases by 2–8°C (see figure **Replace DNA with LNA for higher melting temperature**). In addition, LNA oligonucleotides can be made shorter than traditional DNA or RNA oligonucleotides and still retain a high T_m. This is important when the oligonucleotide is used to detect small or highly similar targets.

Since LNA oligonucleotides typically consist of a mixture of LNA and DNA or RNA, it is possible to optimize the sensitivity and specificity by varying the LNA content of the oligonucleotide. Incorporation of LNA into oligonucleotides has been shown to improve sensitivity and specificity for many hybridization-based technologies including PCR, microarrays and in situ hybridization (ISH).

T_m normalization enables robust detection, regardless of GC content. The T_m of a nucleotide duplex can be controlled by varying the LNA content. This feature can be used to normalize the T_m across a population of short sequences with varying GC content. For AT-rich nucleotides, which give low melting temperatures, more LNA is incorporated into the LNA oligonucleotide to raise the T_m of the duplex. This enables the design of LNA oligonucleotides with a narrow T_m range, which is beneficial in many research applications such as microarrays, PCR and other applications in which sensitive and specific binding to many different targets must occur under the same conditions simultaneously. The power of T_m normalization is

Principle

Use the guidelines below when designing your own Custom LNA Oligonucleotides:

- LNA will bind very tightly to other LNA residues. Avoid self-complementarity and cross-hybridization to other LNA-containing oligonucleotides
- Keep the GC content between 30–60%
- Avoid stretches of more than 4 LNA bases, except when very short (9–10 nucleotides) oligonucleotides are designed
- Avoid stretches of 3 or more Gs or Cs
- For novel applications, design guidelines may have to be established empirically

Applications

LNA oligonucleotides can be successfully used in a wide range of applications, including:

- miRNA research
- Small RNA research
- SNP genotyping
- mRNA antisense oligonucleotides
- Allele-specific PCR
- RNAi
- DNAzymes
- Fluorescence polarization probes
- Molecular beacons
- Microarray gene expression profiling
- Gene repair/exon skipping
- Splice variant detection
- Comparative genome hybridization (CGH)