

Chemically Synthesized CRISPR Guide RNA

Introduction

Agilent's Chemically Synthesized Guide RNAs are the industry standard for quality nucleic acids. Using a patented, proprietary chemistry¹ makes the synthesis of long RNA oligonucleotides extremely robust and efficient. This chemistry is used to synthesize and deliver high quality CRISPR guides, and our processing provides guides with fewer contaminants, for quick and easy editing with the highest indel frequency and reproducibility. Agilent researchers have also developed patented chemical modifications which improve the efficiency, stability and specificity of guide RNAs in a variety of cell types^{2,3}.

Key features

- Custom sequences up to 160nt
- High-quality research grade guides in quantities from 100 µg to 100 mg (3 - 3000 nmol)
- Dedicated facility for clinical grade and GMP material
- Chemical modifications at no extra charge (M or MS at 5' and 3' ends)
- Additional modifications and longer lengths available upon request

Background

Stability and activity are greatly enhanced by Agilent developed chemical modifications

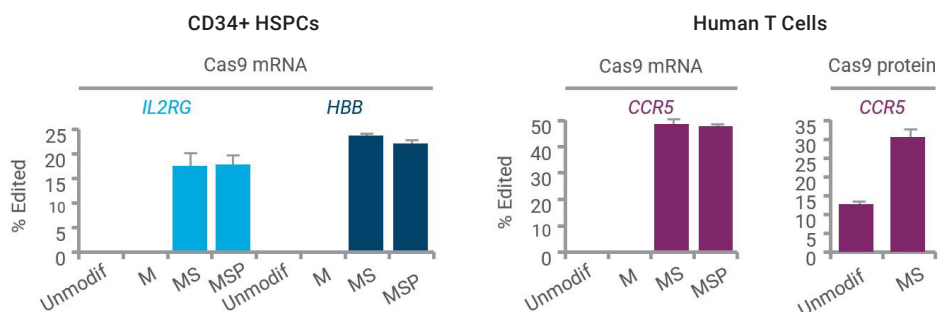


Figure 1. Chemically modified sgRNAs facilitate high frequencies of indels and homologous recombination in cells.² 2'-O-methyl 3'-phosphorothioate (MS), 2'-O-methyl (M)

Agilent sgRNA meets the most stringent quality standards

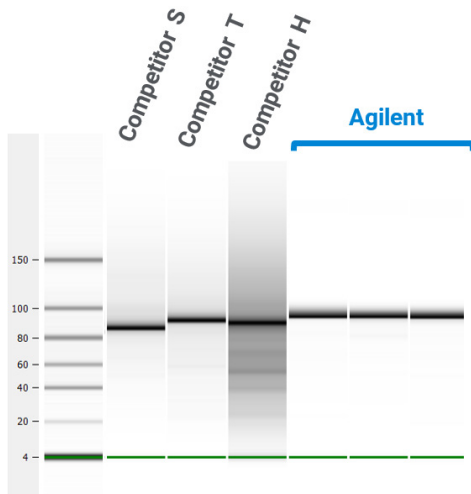


Figure 2. sgRNA samples of varying lengths analyzed on Agilent Bioanalyzer using a Small RNA Assay kit, following the kit protocol.

Agilent chemistry enables long RNA oligos for diverse applications

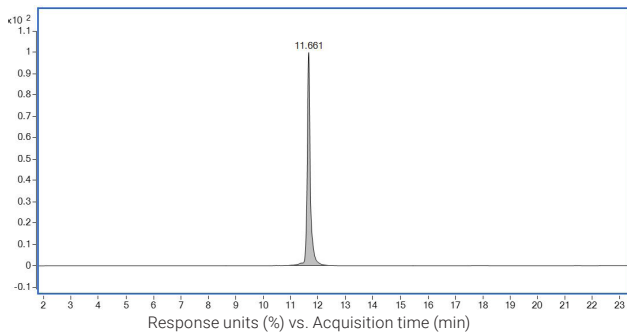


Figure 3A. HPLC chromatogram (diode array detector, 260 nm) of purified stability-modified 100mer sgRNA on Agilent 1290 Infinity II chromatography system. Similar results have been obtained with oligos up to 144 nucleotides. Custom sequences up to 162mer are available by request.

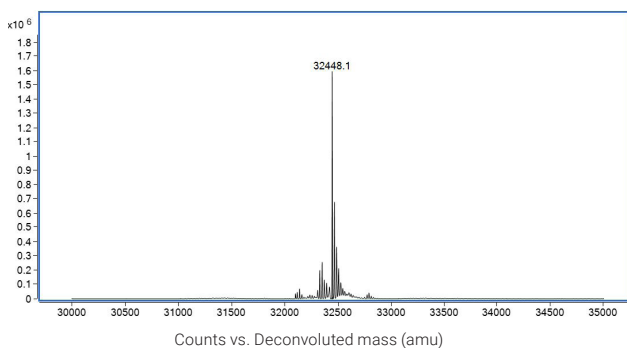


Figure 3B. Deconvoluted mass spectrum of purified stability-modified 100mer sgRNA on Agilent 6545 QTOF mass spectrometer. Expected mass, 32446.9 amu; observed mass, 32248.1 amu. Similar results have been obtained with oligos up to 144nt. Custom sequences up to 162mer are available by request.

Delivering research to GMP solutions

Partner with Agilent and benefit from our industry leading nucleic acid solutions to efficiently advance from research to lead oligo candidates for clinic and market. One of the many advantages of working with Agilent is our ability to provide a seamless experience from research grade to GMP material.

Extensive knowledge and experience enable Agilent's nucleic acid experts to provide high purity R&D grade material for your preliminary research assays and development phase pilots, and then accelerate the scale-up to large quantity GMP material when you are ready. Agilent supports you through all phases of growth and will assist in the transition from early stage research to clinical development to commercialization.

References

Publications

1. Dellinger, D.J., *et al.* Streamlined Process for the Chemical Synthesis of RNA Using 2'-O-Thionocarbamate-Protected Nucleoside Phosphoramidites in the Solid Phase, *J. Am. Chem. Soc.* 133, 11540–11556 (2011); DOI: [10.1021/ja201561z](https://doi.org/10.1021/ja201561z)
2. Hendel, A., *et al.* Chemically modified guide RNAs enhance CRISPR-Cas genome editing in human primary cells. *Nature Biotechnology*, Vol. 33 No. 9 (2015); DOI: [10.1038/nbt.3290](https://doi.org/10.1038/nbt.3290)
3. Ryan, D.E., *et al.* Improving CRISPR-Cas specificity with chemical modifications in single-guide RNAs. *Nucleic Acids Research*, Vol. 46, No. 2 (2018); DOI: [10.1093/nar/gkx1199](https://doi.org/10.1093/nar/gkx1199)

Agilent Patent information (United States)

- US20160289675, US20180051281 - Guide RNA with chemical modifications, Ryan, *et al.*
- US20170355985 (Patent pending) - High specificity genome editing using chemically modified guide RNAs, Dellinger, *et al.*

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Ordering information

Order Information	Product Name
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