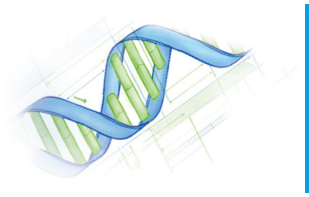
SurePrint Oligonucleotide Libraries

Advantages

- Industry leading fidelity - Consistently low error rates improve your functional results and reduce screening time
- Consistent, high-quality synthesis for libraries of up to 244,000 unique custom sequences
- High complexity, parallel synthesis without sacrificing fidelity
- Rapid customization at ultra-high quality means you can design your library around your workflow

Solutions offered by Agilent

Agilent's oligo library synthesis platform offers the world's most advanced and reliable manufacturing scale array-based DNA synthesis. We have harnessed the SurePrint platform to refine the DNA printing process for oligo libraries, giving us the ability to generate libraries far superior to those that have previously been available. Every library we synthesize is custom, so you can design your own library from the ground up, making the start of your experiments more accessible than ever.



Create custom user-defined oligo library design

SurePrint oligo printing:
Chemically synthesize oligos on array

Release oligos from surface

Mixture of pooled oligos

At Agilent we utilize our advanced DNA synthesis platform to offer fully custom oligo libraries compatible with any application or experimental approach.

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Agilent SurePrint platform

Agilent Oligonucleotide libraries are manufactured using a proprietary, non-contact industrial inkjet printing process in which oligo monomers are deposited uniformly onto specially-prepared glass slides. This *in situ* synthesis process prints oligonucleotide probes, base-by-base, from digital sequence files. The precise inkjet process enables the delivery of extremely small, accurate volumes of the chemicals to be spotted. In contrast to traditional synthesis, Agilent libraries are directly synthesized as highly complex pools enabling a high level of customization.

Long oligo synthesis

Agilent has been a technological leader in the synthesis of longer oligos for the past decade. Conventional synthesis begins to accumulate a large number of deletions once the length exceeds around 50 nucleotides. At this point, the yields become too low to efficiently synthesize and purify the oligos. Our process allows synthesis of long oligos exceeding 220 nucleotides in length.

QC process

Agilent's oligo libraries have been utilized for a vast range of precision applications. Each pool of Agilent oligos is synthesized alongside a control batch, allowing a full assessment of the printing process prior to shipping the oligonucleotide library.

Discover the Agilent library manufacturing advantage

Generating high quality oligonucleotide libraries starts with synthesizing high-complexity pools of custom oligonucleotides. Agilent uses an array-based synthesis, based on ink-jet technology to deposit individual bases into defined positions on a slide. Oligonucleotides are built up one base at a time until the desired length is reached. The constructs are then cleaved from the slide, pooled, dried, and shipped to the customer in a single tube. Oligo libraries can then be resuspended, amplified, and used in any downstream application.

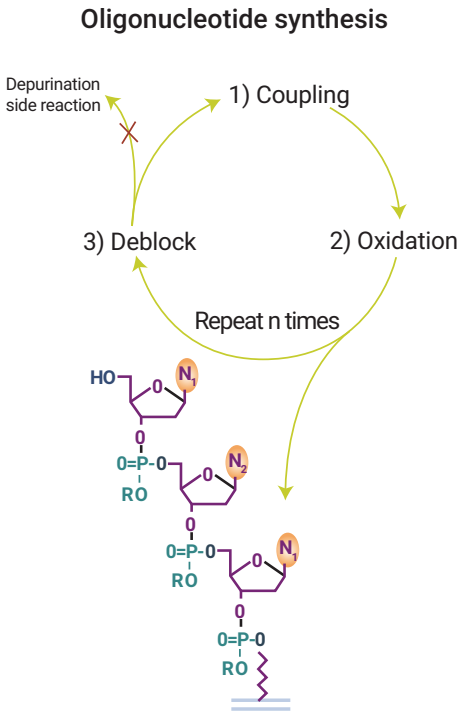

Figure 1. The general cycle of oligo synthesis via phosphoramidite chemistry. Agilent's real time quality control inspection system verifies chemical deposition at each step in the process to minimize oligo drop-out and premature truncation.

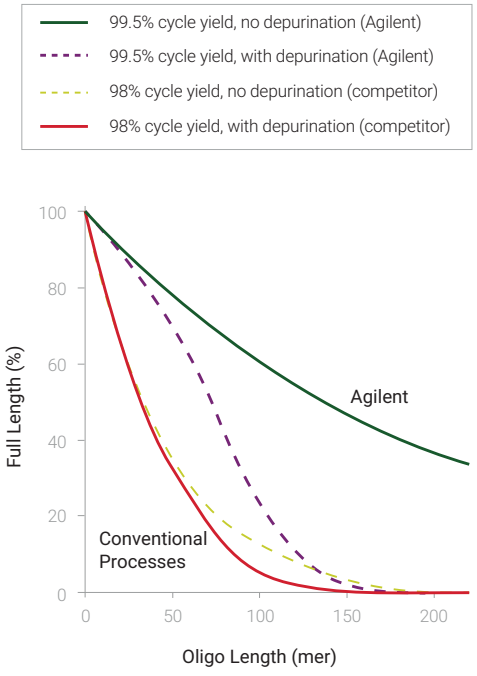

Figure 2. Calculated yield of full-length oligonucleotides as a function of length, at two different cycle yields, with and without depurination. Conventional processes used by competitors see a large fall-off in fidelity compared to Agilent's platform.

Superior fidelity and representation in Agilent oligonucleotide libraries

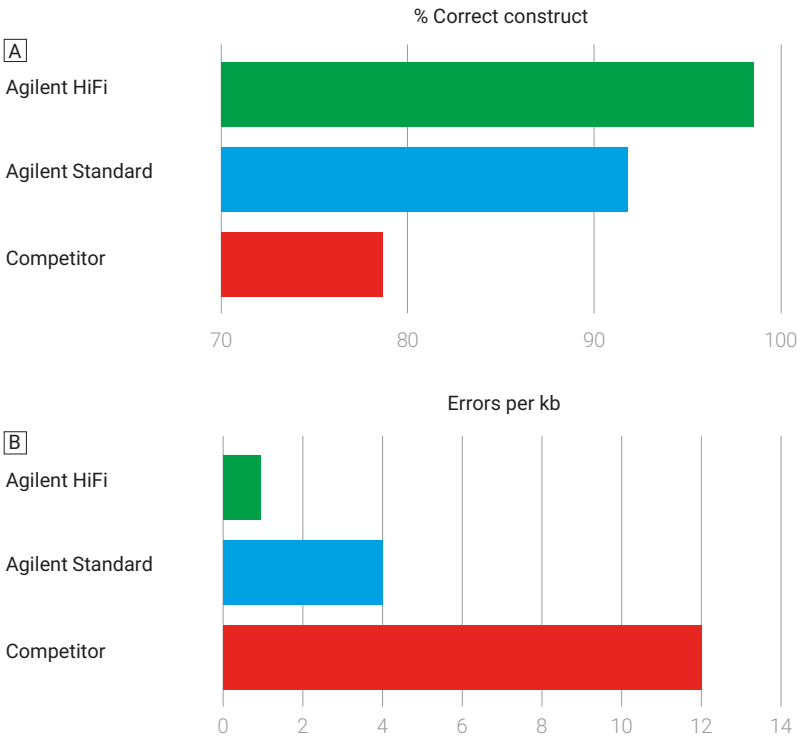

Figure 3. A) A comparison of the percent of sequence perfect constructs in an Agilent SurePrint High Fidelity (HiFi) library (green, 98%), an Agilent SurePrint Standard library (blue, 92%), and the same library from a competitor (red, 78%). **B)** A comparison of the number of errors/kb in the same library for Agilent HiFi (green, 1), Agilent Standard (blue, 4), and a competitor (red, 12). Agilent SurePrint libraries contain less than half the number of errors as competitors leading to clearer results and reduced screening times. Note: For information on accessing HiFi libraries, please contact us.

Oligonucleotide library representation

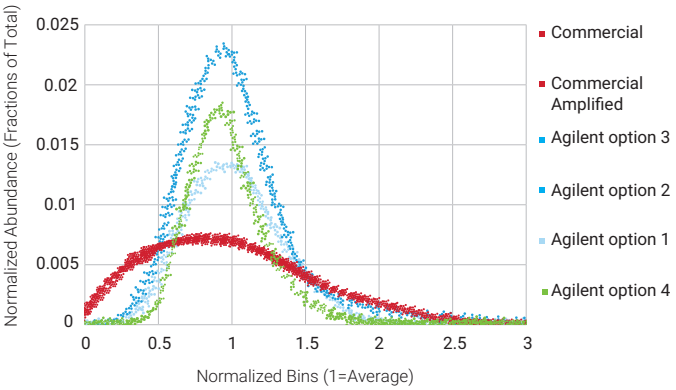

Figure 4. Distribution of sequenced oligos in a pool. Blue and green curves represent the normalized abundance of reads in four Agilent libraries. A value of .5 indicates oligos for which the number of reads are ½ as abundant as the average. The red curves are the same data for a commercially available competing library.

Library quality

There are multiple parameters that one needs to consider in both choosing an oligo library and designing an experiment. The first is library fidelity, which refers to the error rate (errors per kilobase) in a sequenced library. Agilent's libraries are all synthesized on its technologically advanced SurePrint platform with error rates well below the industry average. While fidelity is important to generating a high quality library the second parameter, representation, is even more critical. Representation refers to the relative abundance of each oligo sequence in the pool and can be measured by comparing the number of under-represented oligos to the number of over-represented oligos. If too many over-represented oligos are present, they will dominate the results and increase the number that needs to be screened to get full coverage of the members in the pool. Similarly, if too many oligos are under-represented then the amount of screening that needs to be done rapidly becomes prohibitive.

Agilent's DNA synthesis technology allows rational design of parallel synthesis that permits tailoring of library representation to achieve the most uniform distribution of oligos across even the most complex libraries.

Advanced nucleic acid technology for better libraries

Agilent Technologies has a long history of building nucleic acids. Originating through Agilent's spin-off from Hewlett-Packard Company, our DNA oligonucleotide synthesis technology is based on the concepts that enable ink-jet printing. This platform empowers the printing of up to a million oligo features on a single chip, creating highly complex oligo pools with each oligo present in precise ratios. The advanced chemistries developed at Agilent also enables the printing of longer oligos than are typically available from commercial suppliers. If you are looking for the highest quality custom oligo libraries, Agilent has a solution for your needs.

Ordering information

Product	Complexity	Oligo Length	Quantity	Catalog #
Oligonucleotide Library 7.5K - Academic	Up to 7,500 unique oligo sequences	30-230 nt	10 pmol total DNA	G7220A
Oligonucleotide Library 15K - Academic	Up to 15,000 unique oligo sequences	30-230 nt	10 pmol total DNA	G7221A
Oligonucleotide Library 60K - Academic	Up to 60,000 unique oligo sequences	30-230 nt	10 pmol total DNA	G7238A
Oligonucleotide Library 100K - Academic	Up to 100,000 unique oligo sequences	30-230 nt	10 pmol total DNA	G7222A
Oligonucleotide Library 244K - Academic	Up to 244,000 unique oligo sequences	30-230 nt	10 pmol total DNA	G7223A
Oligonucleotide Library 7.5K	Up to 7,500 unique oligo sequences	30-230 nt	10 pmol total DNA	G7224A
Oligonucleotide Library 15K	Up to 15,000 unique oligo sequences	30-230 nt	10 pmol total DNA	G7225A
Oligonucleotide Library 60K	Up to 60,000 unique oligo sequences	30-230 nt	10 pmol total DNA	G7239A
Oligonucleotide Library 100K	Up to 100,000 unique oligo sequences	30-230 nt	10 pmol total DNA	G7226A
Oligonucleotide Library 244K	Up to 244,000 unique oligo sequences	30-230 nt	10 pmol total DNA	G7227A

www.agilent.com/genomics/OLS

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