Revolutionizing Clinical Research

Agilent NGS

Next Generation Sequencing
Complete Solutions

Agilent Technologies

Your Partner in Every Step

NGS: Revolutionizing Genetic Analysis with Single-Molecule Resolution

Next generation sequencing has revolutionized variant analysis by providing single molecule sensitivity, enabling detection of rare alleles and those of low frequency even within highly heterogenous samples. This single molecule detection in a massively parallel manner allows you to overcome the inherent limitations of Sanger sequencing such as throughput, scalability, speed and resolution.

Sensitivity doesn't come without a cost and a more cost-effective solution to analyze specific targets by next generation sequencing is still a need. Target enrichment is a solution that provides exactly that—a way to focus reads on only those regions that matter.

The Leader in Target Enrichment

In 2009, Agilent introduced SureSelect, the first target enrichment solution for next generation sequencing. It enabled cost-effective analysis of thousands of targets, a paradigm shift in the elucidation of genes involved in disease pathogenesis. Since then, Agilent has become the leader in target enrichment solutions making major strides towards providing the complete solution from library prep, enrichment, sample QC, automation and data analysis.

Enabling Success, Advancing Clinical Research

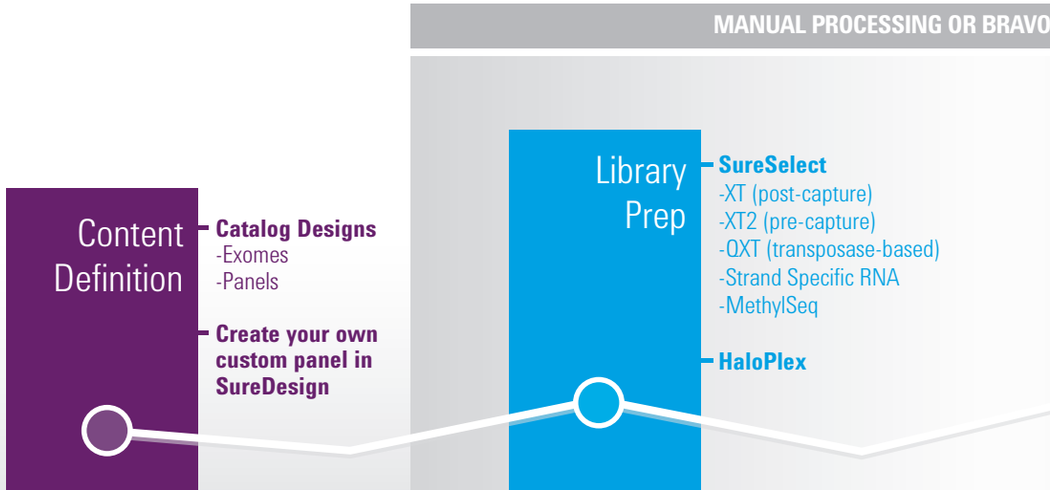
Agilent offers a full range of catalog and custom target enrichment solutions that enable a streamlined workflow tailored to meet specific needs for target coverage, throughput and turn-around time for comprehensive profiling of variants.

SureSelect is a proven hybridization-based technology that has been instrumental in advancing NGS. With workflows that provide the fastest hybridization times and different pooling strategies, highly sensitive and accurate variant calling performance is achieved with either large exome captures or highly targeted panels.

HaloPlex is a library prep-free next generation PCR technology that enables streamlined workflows for target enrichment. This technology leverages the high coverage and specificity of PCR while providing amplicon redundancy to ensure target coverage. This FFPE-compatible technology has been used in the discovery of variants involved in the biological mechanisms of cancer.

A Complete NGS Solution

For All Major NGS Platforms
Manual or Automated



–from Sample to Data

Two Technologies, Infinite Possibilities

SureSelect

The Gold Standard in Target Enrichment

Great for:

- Detection of mutations, LOH and copy number
- Large custom captures (500kb-24Mb)
- Highly sensitive and accurate variant calling
- DNA and RNA Target Enrichment

HaloPlex

Next Generation PCR for NGS

Great for:

- Small custom captures (1kb-500kb)
- High specificity
- High sensitivity
- Streamlined workflow

SureCall–Data Analysis Bottleneck Resolved!

SureCall addresses the critical needs of clinical researchers. The free-of-charge software incorporates the most widely accepted open source algorithm optimized for accurate variant detection, including finding low allele frequency variants in cancer samples, and copy number changes.

- Easy-to-use and faster time-to-results
- Streamlined workflow for analysis
- Reduce the need for complex bioinformatics
- Integrated data analysis of SNPs, LOH, and genome-wide CNVs

For more info:
www.agilent.com/genomics/surecall

-AUTOMATED

Enrichment

- **OneSeq**
- **ClearSeq** Disease-focused Research Panels
- **Clinical Research or Research Exomes**
- **Custom Designs (DNA/RNA)**

Library QC

- **2100 Bioanalyzer System**
- **2200 TapeStation System**

Data Analysis

- **Integrated copy number and mutation data analysis in SureCall**
- **RNA and Methylation workflows in GeneSpring**

Proven Technology

Pave the Way to Constitutional Research

In the last 5 years, SureSelect and HaloPlex have played major roles in the identification of disease-associated genes by providing flexible solutions that couple expert-optimized designs with quick and easy workflows. This has addressed the need for deep target coverage, comprehensive and accurate variant calling and faster sample to data.

More Mendelian Disease Genes uncovered by SureSelect

Efforts to provide streamlined solutions for constitutional research has led to the introduction of three highly optimized designs that enable compatibility with both high output and benchtop sequencers that pave the way to definitive identification of disease-associated variants: **SureSelect Clinical Research Exome**, **SureSelect Focused Exome**, and **SureSelect Inherited Disease**. Coupled with the accelerated workflow of **SureSelect^{QXT}**, sequencing-ready libraries are generated in a day enabling faster sample to answers. Increased interest in analyzing copy number variants from NGS has led to Agilent's latest innovation – **OneSeq**, a combined detection of CNVs, SNPs, and LOH, allowing clinical researchers to investigate the role of CNVs in addition to mutations in many genetic disorders.

			Product Name	Features
Baits	Target Enrichment for SNPs, LOH, and genome-wide CNV detection	NEW!	**OneSeq Constitutional Research Panel**	-Combined genome-wide CNV backbone, LOH, plus targets from SureSelect Focused Exome enabling mutation detection within disease-associated genes.
		NEW!	**OneSeq CNV Backbone + Custom**	-Create designs with OneSeq CNV Backbone plus custom mutation panels up to 12Mb using SureDesign.
	Capture baits for hybridization-based enrichment		**SureSelect Clinical Research Exome**	-Comprehensive analysis of whole exome, with deeper coverage of disease-associated regions, ideal for the study of rare disorders.
		NEW!	**SureSelect Human All Exon V6, SureSelect Human All Exon V6 + UTR**	-Most comprehensive exome capture design optimized for breadth and depth of coverage for highly sensitive and accurate variant calling as well as data uniformity for minimal sequencing.
			SureSelect Focused Exome	-Design targeted only on disease-associated regions, enabling compatibility with high-output or benchtop sequencers.
			SureSelect Inherited Disease	-Highly focused design that targets only the ~2,800 genes known to cause inherited diseases. -Ideal for deep sequencing or trio analysis on a benchtop sequencer.
			SureSelect Custom	-Create custom designs targeting regions of interest from 1kb-24Mb using SureDesign.
	NGS disease research panels		**ClearSeq Connective Tissue Disorders**	-Focus on 40 genes known to play an important role in inherited forms of connective tissue disorder, including Marfan syndrome, Ehlers-Danlos syndrome, Loeys-Dietz syndrome, thoracic aortic aneurysm and dissection (TAAD), Stickler syndrome and Osteogenesis imperfecta.
			ClearSeq Cardiomyopathy	-Designed specifically for inherited forms of cardiomyopathy, including hypertrophic cardiomyopathy, dilated cardiomyopathy and arrhythmogenic right ventricular cardiomyopathy.
			ClearSeq Arrhythmia	-Targets genomic regions in 20 genes known to be linked to four inherited arrhythmia-related heart disorders.
Library Prep	Next Gen PCR		**HaloPlex**	-Create custom designs targeting regions of interest from 1kb-5Mb using SureDesign.
	Library prep for hybridization-based target enrichment		**SureSelect^{QXT}**	-Accelerated 90-minute hyb coupled with transposase-based library prep for sample-to-sequencing in a single day.
			SureSelect^{XT}	-High complexity target-enriched libraries for rare variant detection.

You Can Trust

Unlocking the Cancer Genome

SureSelect and HaloPlex are key players in efforts to catalog mutations in cancer by enabling the identification of key low allele frequency mutations, indels, CNVs, gene fusions and translocations in many solid and hematological cancers. Optimized catalog and custom designs coupled with efficient SureSelect and HaloPlex workflows provide deep coverage for confident variant detection.

More Cancers Profiled using SureSelect & HaloPlex

To enable the accurate and comprehensive identification of somatic variants in solid tumors and hematological cancers, Agilent offers expert-defined focused panels. **ClearSeq Comprehensive Cancer**, **ClearSeq AML** and **ClearSeq Cancer** allows for deep coverage of disease-associated targets. For high sensitivity identification of low allele frequency variants in heterogenous cancer samples, **HaloPlex^{HS}** incorporates unique molecular barcodes into each DNA library fragment. Combined with low input FFPE-compatible workflows and **SureCall** data analysis software, Agilent provides a rapid and complete sample-to-data solution ideal for the cancer clinical researcher.

			Product Name	Features
Baits	Capture baits for hybridization-based enrichment	NEW!	**SureSelect Human All Exon V6 + COSMIC**	-Leverages the most comprehensive exome design with the addition of targets relevant to cancer research.
			SureSelect Human Methyl-Seq	-Comprehensive target enrichment for focusing on the regions where methylation is known to impact gene regulation.
			SureSelect Custom	-Create custom designs targeting regions of interest from 1kb-24Mb using SureDesign.
			SureSelect RNA Capture	-RNA target enrichment enabling deeper understanding of gene expression.
	NGS disease research panels	NEW!	**ClearSeq Comprehensive Cancer**	-Enables genetic analysis of 151 key genes associated with a wide range of cancers.
			ClearSeq AML	-Enables deep coverage of 20 genes frequently mutated in acute myeloid leukemia.
			ClearSeq Cancer	-Identify somatic variants in 47 genes targeting known COSMIC hotspots found to be associated with a broad range of cancer types as well as published drug targets.
			ClearSeq Kinome	-Enables analysis of the human kinome including untranslated regions (UTRs).
Library Prep	Library prep for hybridization-based target enrichment		**SureSelect^{XT}**	-Ligation-based library prep that enables generation of libraries of maximal complexity, ideal for analysis of highly heterogenous samples with variants of low frequency.
	Next Gen PCR	NEW!	**HaloPlex^{HS}**	-Unique molecular barcodes are incorporated into each DNA library fragment enabling de-duplication of reads and low allele frequency variant detection.
			HaloPlex	-Create custom designs targeting regions of interest from 1kb-5Mb using SureDesign.
	Library prep for whole transcriptome sequencing		**SureSelect Strand-Specific RNA**	-Discern overlapping transcripts and investigate antisense transcription.
	Input Sample QC	NEW!	**Agilent NGS FFPE QC Kit**	-qPCR-based assay for upfront sample prequalification and quantitation of amplifiable DNA prior to NGS library prep. Quality scores tie in to recommended modifications to the SureSelectXT Low Input Target Enrichment workflow to maximize target coverage and library complexity

Customize Your Genes for a Perfect Fit

Unparalleled Flexibility, Unmatched Performance

Agilent allows you to create any panel suitable to your specific field of interest by harnessing the flexibility of Agilent's proprietary SurePrint oligo manufacturing technology in the creation of custom NGS target enrichment libraries.

- Proven platform: More than 30,000 custom target enrichment designs created
- Flexibility to produce capture libraries from 1kb to 24Mb
- Easily leverage validated bait designs from catalog panels

Unrivaled Ease: SureDesign Custom Design Tool

SureDesign is a free web-based application allowing you to create custom NGS target enrichment libraries that are specific to your research needs within minutes.

- Intuitive design wizard allows you to create designs based on target genes, genomic coordinates or selection parameters
- Comprehensive design report and target files are generated for easy review
- Collaborative Custom Design Service available for any organism

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Welcome to the Agilent
NGS Resource Center!

Looking for information regarding Agilent's NGS portfolio, cancer and constitutional applications, related literature, webinars, technical support and more? We have a wide array of tools to answer your Next Generation Sequencing questions.

We have you covered

For more info:
www.agilent.com/genomics/NGSResource

To request more information or get a demo, call your Agilent Sales Representative.

CALL OR LEARN MORE AT:
1-800-227-9770 | www.agilent.com/genomics

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