



Providing Complete Solutions for Genomics

AGILENT HELPS SCIENTISTS GAIN INSIGHTS INTO DISEASE STATES AND THERAPEUTIC TARGETS

In genomics, the progression from basic to translational research used to take ten or fifteen years. Now takes five. Along this continuum, customer needs vary:

In the earliest stages, customers want new tools and techniques they can tinker with, tools they can customize to address purely scientific questions and increase their understanding of fundamental principles.

Once customers in applied research see what a new tool can do, they want a stable, standardized version they can use to address practical problems.

Finally, customers in translational research want a user-friendly version of the tool with proven protocols they can easily repeat in clinical studies, employing the lessons of basic and applied research to advance human health.

Agilent is working with leading customers in each of these segments.

Key technologies

Agilent's key differentiator is a novel approach to synthesizing oligonucleotides, which are strands of DNA or RNA that regulate gene expression. The company's [SurePrint](#) manufacturing process is basically inkjet printing. Instead of ink on paper, however, Agilent prints oligos onto glass microscope slides. The company uses this patented technology to generate longer, more accurate oligos than any of its competitors—and it offers customers a choice of standard, off-the-shelf slides or custom, made-to-order slices of the genome.

Agilent leads the market in [target enrichment](#), a key component of next-generation sequencing (reading strands of DNA to determine the precise order of the base nucleotides.) The company's [SureSelect and HaloPlex](#) platforms enable researchers to choose specific segments of a genome for deeper analysis—avoiding the time and expense involved in sequencing the whole thing.

Agilent is also a leader in [array-comparative genomic hybridization](#), a high-resolution technique for detecting genomic variations. Array CGH is typically used to compare the DNA of a particular individual against a reference sample. Agilent offers a complete [array CGH solution](#) for mapping structural variations associated with developmental abnormalities, cancer and its progression, susceptibility to disease, and differing responses to treatment.

Mutagenesis, a way of modifying DNA to engineer desired mutations, is another area where Agilent leads the (still emerging) market. Mutagenesis allows researchers to modulate protein activity and characterize structure/function relationships, which enriches the understanding of basic cellular processes and disease mechanisms. Better understanding, in turn, promotes the discovery of new therapies for complex diseases such as cancer. Agilent's [mutagenesis products](#) make it easy for scientists to achieve accurate, reliable results in the shortest possible time.

Agilent also provides solutions in the following areas:

Gene-expression microarrays tell researchers which genes in a cell are turned on or off. This enables them to compare the expression patterns of healthy cells to those of cancer cells, for example. Researchers study gene expression to identify early warning signs of diseases, devise new therapeutics, and even investigate which drugs could work best for certain patients. [Agilent's gene-expression microarrays](#), prized for high performance and reliability, provide scientists with a flexible, affordable platform for their gene-expression studies.

QPCR (quantitative polymerase chain reaction) is a technique used to amplify and quantify a specified molecule of DNA for either basic research or diagnostic purposes. Agilent's prep-to-analysis solutions include fully integrated reagent kits, instruments, and software. Used together, they give researchers the best sensitivity, specificity, and speed.

Fluorescent in situ hybridization, or FISH, is a technique used in biomedical research to show the presence or absence of specific DNA sequences—sequences that may, for example, indicate cancer. Agilent's [SureFISH](#) assays provide higher resolution and faster hybridization than competing technologies.

For more information, please visit Agilent's [genomics](#) website.