Academic Research

Innovative solutions for transforming raw biological samples into valuable molecular insights accelerate scientific breakthroughs in the world's leading laboratories.

Life science research encompasses many disciplines focusing on organisms ranging from humans and animals to plants and bacteria. Much of the research in biochemistry, biomedicine and genetic engineering is done on a molecular level – and QIAGEN's technologies are staples in the workflow of most life science laboratories. As scientists improve our understanding of basic processes in cells and organisms, groundbreaking discoveries are paving the way for development of new treatments for disease and other innovative applications.

Rapid advances in genomic knowledge and sequencing technologies are enabling scientists to probe new frontiers in the understanding and treatment of diseases, as well as other biological processes. Yet budget pressures and increased competition among scientific institutions have made it harder to publish new findings and to secure financial support, so the life sciences and related academic research fields are increasingly susceptible to time and cost pressures.

QIAGEN works closely with leading academic institutions around the world to bring cutting-edge technologies to the Life Sciences, while providing solutions to the laboratories' need for standardized, efficient methods of carrying out research in today's research environment.

QIAGEN sets standards in academic research

QIAGEN revolutionized academic life science research in 1986 with the introduction of the first kit for high-quality purification of plasmids – small ring-shaped DNA molecules in bacteria.

Compared to traditional “home brew” methods, this technology cut the preparation time for plasmids from two or three days down to two hours.

Today, QIAGEN continues to set the pace in molecular testing technologies. Close cooperation with academic researchers keeps QIAGEN at the forefront of meeting the needs of scientists and lab managers. Innovations that arise in academic research frequently flow into other customer groups served by QIAGEN, namely Molecular Diagnostics, Academia/Applied Testing, and Pharma.

QIAGEN in academic research

With groundbreaking sample and assay technologies, automation platforms and bioinformatics solutions, QIAGEN makes it possible for scientists to arrive at precise results in the shortest amount of time. Today, the company markets hundreds of different products for academic research laboratories, and is a market leader in several categories such as commercial sample preparation technologies and bioinformatics.

Examples of QIAGEN’s contributions to cutting-edge research:

- Liquid biopsies: In biomedical research based on molecular testing, tissue samples collected through surgical biopsies are often a scarce and expensive resource. QIAGEN has pioneered the use of liquid biopsies to transform more plentiful and easily obtainable samples of blood or other body fluids in valuable molecular insight. QIAGEN is the only company providing the essential tools for all three liquid biopsy approaches being used in research: free-circulating nucleic acids, circulating tumor cells and exosomes (tiny enclosures that are a key part of the body’s complex communication system). Most liquid biopsy experiments start with a QIAGEN product because of the company’s comprehensive liquid biopsy portfolio, which includes workflows from sample prep to bioinformatics. Liquid biopsies not only are enabling clinical research, the technology also holds great promise for the development of minimally invasive diagnostic tests to change the treatment of diseases such as cancer.
- Next-generation sequencing and bioinformatics: New sequencing technologies for nucleic acids allow scientists to generate vast amounts of highly complex biological data, advancing the understanding of molecular causes for diseases and enabling the development of new treatments. QIAGEN supports this work with innovative Sample to Insight workflows as well as industry-leading bioinformatics solutions for analysis and interpretation of NGS data that is integrated in the workflow. QIAGEN recently launched a comprehensive portfolio of novel and universal QIAseq NGS panels based on a new and proprietary “Digital NGS” technology allowing unbiased, accurate quantification of DNA, RNA and miRNA with next-generation sequencing (NGS). The QIAseq panels are incorporated into highly integrated Sample to Insight workflows, which include cloud-based bioinformatics for advanced data analysis and interpretation.
- Biomarkers: QIAGEN offers scientists a broad panel of products for the identification and validation of novel biomarkers, which provide clues about specific physical conditions and enable the development of new applications in Personalized Medicine, which is fostering dramatic changes in the selection and monitoring of cancer treatments. QIAGEN’s offering in this field encompasses special test panels for analysis of entire disease and cell signaling pathways as well as various tests for a detailed analysis of all 30,000 human genes. These

panels include solutions optimized for human biomarker studies, including PCR arrays, miRNA, siRNA, mutation analysis, pathway reporter, chromatin IP, DNA methylation and protein expression products.

- microRNA (miRNA): QIAGEN introduced the first solution that permits hundreds of different miRNAs as well as other RNAs to be sensitively, specifically and simultaneously detected and quantified. Today, QIAGEN offers a variety of miRNA solutions, including those in human, mouse, rat gene expression. miRNA is a class of RNA molecules that is believed to play a key role in RNA interference, a biological process regulating the expression of genes.
- Microbiome: Our bodies are filled with microorganisms that have a critical influence on our health and the environment. As a result, scientists around the world are focusing attention on communities of microbes, known as microbiomes, and on interactions among microorganisms, humans, and the environment. QIAGEN's research is focused on microbiomes with potential applications in clinical, pharmaceutical, and applied technology fields. The long-term strategy is to commercialize clinical diagnostics. QIAGEN's industry-leading portfolio of Sample to Insight solutions for microbial research through include DNeasy, RNeasy and QIAamp sample preparation workflows, unique sample extraction technologies, as well as NGS library preparation workflows such as QIAseq FastSelect DNA kits.
- Bioinformatics: QIAGEN has designed simple yet robust software and cloud-based reference tools for microbiome research. The CLC Microbial Genomics Module enables scientists to study the taxonomic composition and functional elements of microbial communities, find statistically significant correlations with information such as patient data, and identify actionable insights.
- CRISPR-Cas9: is a molecular tool that enables scientists to edit genomic material simply and precisely. QIAGEN has developed a workflow for researchers that brings together all that is needed, starting at experiment design and ending with gene editing. QIAGEN's technology already has been used for exciting peer-reviewed research in the field.
- QIAcuity: Among the leading new product launches in development is QIAGEN's differentiated entry into digital PCR, a fast-growing market in genomic research. QIAcuity is a series of differentiated new platforms designed to make this technology more accessible and attractive to Life Sciences laboratories worldwide. QIAGEN has a growing pipeline of over 1,500 customer leads, and has increased production capacity in light of higher-than-expected demand.

QIAGEN values its heritage as an early innovator in the biotechnology revolution – and is committed to maintaining deep relationships with life science researchers and laboratories. A unique advantage of QIAGEN is its ability to move technologies forward across the continuum from Academia, Pharma and R&D to Molecular Diagnostics and Applied Technologies.