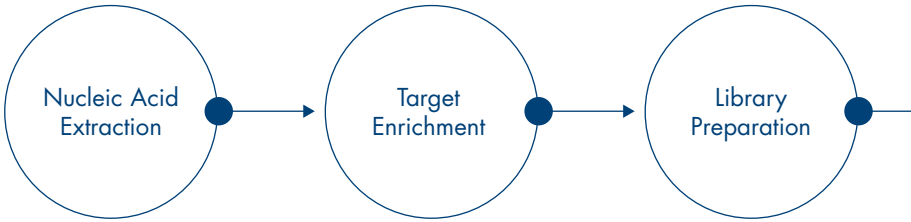
Sample to Insight

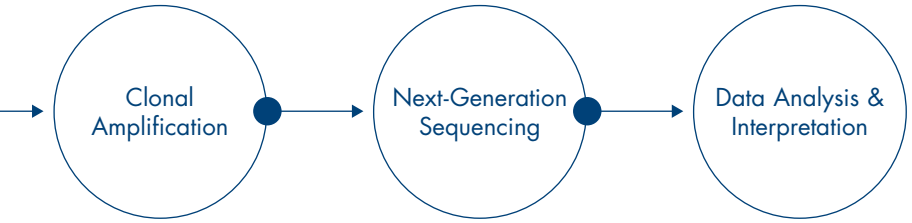
QIAGEN

Next-Generation Sequencing (NGS)



More actionable data and insights in one go. More confidence at one glance. A small step for you, a giant leap for your results.

The application of Next-Generation Sequencing (NGS) technologies to clinical research is having a major impact on the identification of genetic variants that impact human health. NGS enables the study of multiple disease markers from a single sample in a single analysis, making it both faster and cheaper than traditional single gene analyses. Recent technological developments in instrumentation, consumables and bioinformatics have brought NGS to the benchtop and are enabling the clinical research community to find answers to many of the most challenging questions. NGS is helping to refine our understanding of disease and provide the potential to create better research tools.

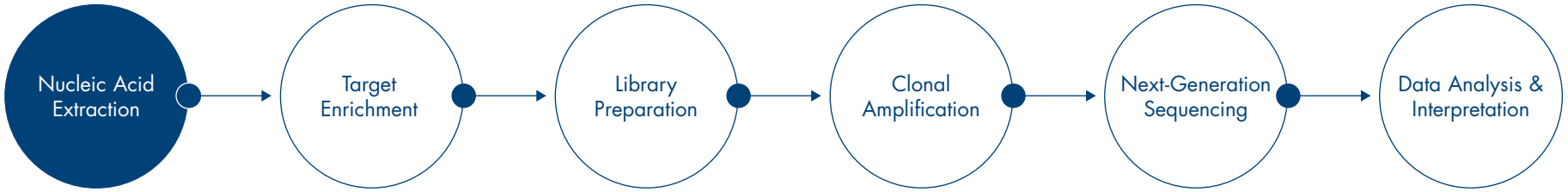


GeneReader NGS System

The GeneReader NGS System is the first complete Sample to Insight NGS solution designed for any research lab to deliver actionable results.

NGS has the potential to help labs create valuable insights, but many barriers still exist, such as high cost, fragmented workflow and ensuring actionable data. From Sample to Insight, QIAGEN's GeneReader NGS System standardizes your workflow to quickly and accurately identify the genetic markers associated with approved therapies, leading professional guidelines and active clinical trials. With the GeneReader NGS System, every lab can benefit from the experience of QIAGEN, the diversified global leader in molecular science. Whether you're entering NGS or expanding your existing environment, GeneReader offers the efficiency of a completely connected NGS workflow focused on actionable reports.

- **The world's first truly complete NGS workflow:** Rely on one partner to provide a seamlessly integrated workflow offering ease of use and efficiency from Sample to Insight.
- **Actionable insights:** Create relevant reports using QIAGEN's proven gene panels and bioinformatics.
- **Flexibility to fit your needs:** Scalable batch sizes and continuous loading of multiple flow cells enable you to adapt and scale the GeneReader NGS System to match your needs and grow.
- **Guaranteed results with predictable costs:** Innovative commercial models such as price-per-insight options offer better cost management and low initial investment hurdles.
- **Proven expertise and service for our customers:** Our teams at QIAGEN are ready to support you in efficiently implementing, validating and operating GeneReader in your lab.

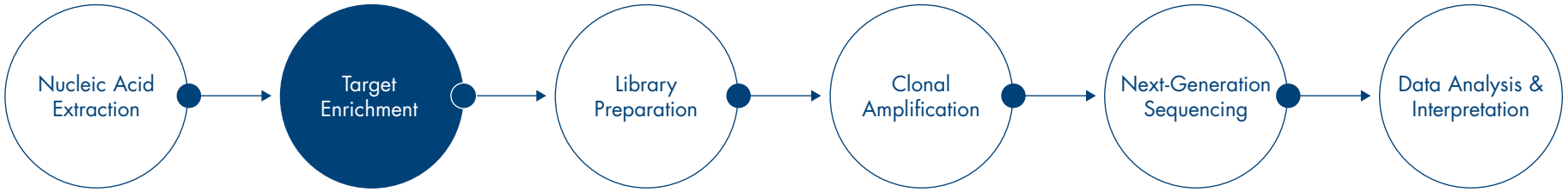


Trust the critical first step of NGS to the global leader

High-quality nucleic acids are a prerequisite for accurate and reliable NGS results from complex samples. QIAGEN's leading expertise in sample preparation technologies means we can offer the best solution for automated extraction of DNA and RNA.

Our sample preparation solutions allow you to extract nucleic acids in an unbiased manner without the loss of valuable genetic information.

The QIAcube® instrument and sample preparation kits for extraction of DNA and RNA offer maximum confidence for processing precious samples for sequencing. Automated processing of samples saves time and achieves standardization. Simultaneously, the sample preparation kits require minimal starting material, facilitate reduction of artifacts and increase the confidence and accuracy of your sequence data.

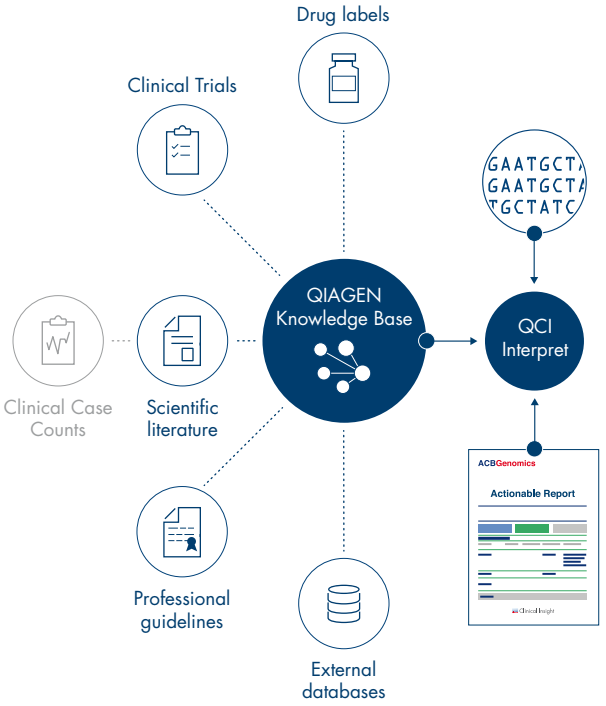


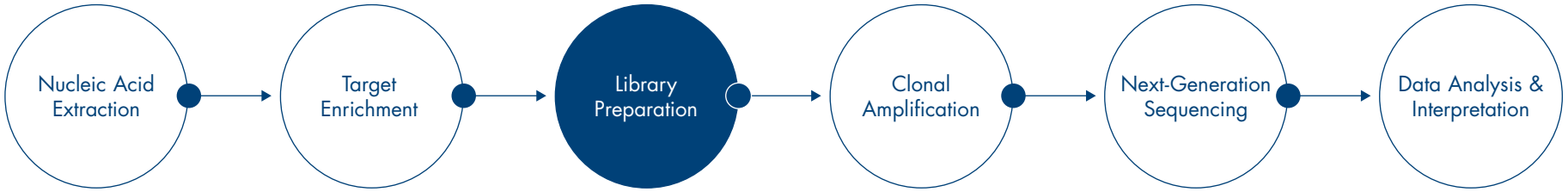
Actionable insights – Create relevant reports using QIAGEN's proven gene panels and bioinformatics tools

One of the biggest challenges of NGS is content selection. With ever-expanding genomic information and increasingly complex medical knowledge, how can you ensure your tests target all of the right genes and variants, and can provide you with the answers you need for your clinical research?

QIAGEN NGS Target Enrichment panels are purpose-built for clinical research labs, designed to identify critical and meaningful variants in actionable genes. Our panel content is carefully selected and purposefully designed, targeting only genes and variants that are important to specific diseases.

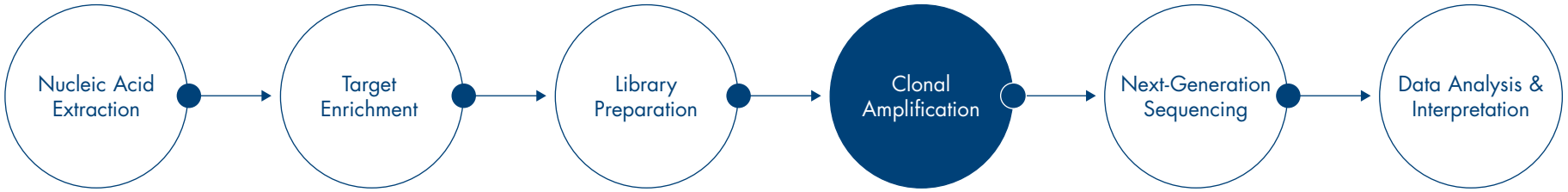
The QIAGEN Knowledge Base is a comprehensive biomedical information resource, built to help labs interpret variants in their clinical research context. Here is it also used to direct panel design by focusing only on actionable genes and variants. The QIAGEN Knowledge Base includes clinically relevant findings from approved drug labels, professional association practice guidelines, active clinical trials, primary literature and curated clinical cases. Our database contains over 10 million findings, 2 million ontology classes and 50 thousand disease-to-phenotype links. The QIAGEN Clinical Insight platform allows you to access the regularly updated content in the QIAGEN Knowledge Base and links variant interpretation and reporting to original panel design.





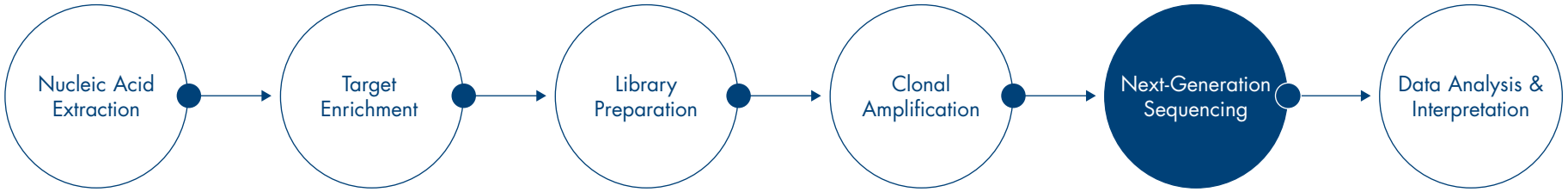
Automated and streamlined to save time

Automating and minimizing sample handling is critical to ensure the best outcome during library preparation. We have developed a unique process to produce high-quality libraries for NGS based on a single-tube protocol. This fast, innovative protocol incorporates a convenient spin-column-based procedure for size selection of fragments to offer time savings of up to 50%, along with a 75% reduction in hands-on time compared to other library preparation solutions. This process also ensures minimal amplification bias, reduces potential risks arising from sample loss or mix-up and offers high-yield libraries from as little as 4 ng of input material.



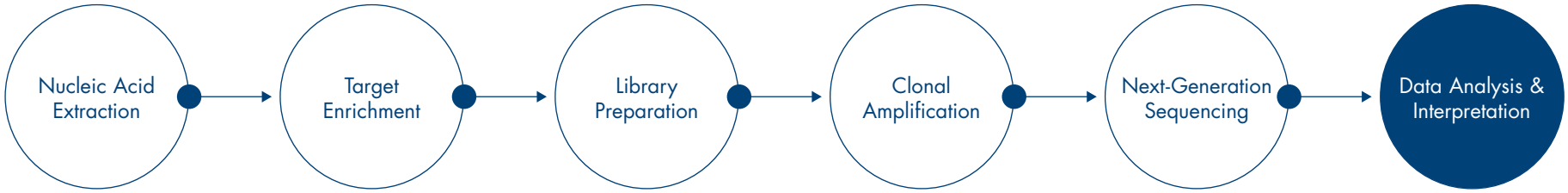
Automating template preparation to ensure a reproducible outcome

Clonal library amplification generates multiple copies of your target areas of interest. Automation of clonal amplification using the newly developed GeneRead™ QIAcube provides you with the advantage of being able to simultaneously prepare sequencing templates of multiple libraries and reduce your sample preparation time. You can also navigate through the processing steps using the highly intuitive user friendly interface and touch screen guides. Amplified libraries obtained through this process are ready for sequencing.



High scalability and flexible throughput

Plan sequencing runs according to your lab's schedule. The GeneReader is always available for you and will grow with your sequencing demands. The GeneReader´s novel turntable design means it is possible to process multiple independent flow cells, making this the first sequencing platform to offer staggered access and paralleled loading of multiple flow cells. This innovative design facilitates sample scalability for targeted sequencing. The GeneReader uses the highly efficient and trusted Sequencing-By-Synthesis (SBS) technology, which involves a 3 step process: extend, measure and cleave. Obtain the best outcome from your sequencing run with peace of mind.



A complete solution for all of your NGS bioinformatics needs

Analysis and interpretation of NGS data can be time consuming and require specialist knowledge. The QIAGEN Clinical Insight (QCI™) platform offers all the tools you need to guide your NGS data analysis and interpretation. QCI consists of two components: QCI Analyze and QCI Interpret, which together help you to extract the greatest value from your NGS assays.

QCI Analyze fully complements the GeneReader, from the setup of sequencing reactions to the automated analysis of sequencing results. This QCI module includes optimized read alignment, variant calling, filtering and integrated visualization so your lab can confirm the analytic validity of your results. QCI Analyze is automated for reliability and ease of use, and is flexible for lab-specific requirements. After reviewing your QC reports and variant data in QCI Analyze, you can continue your analysis in QCI Interpret.

QCI Interpret is a tertiary analysis framework to guide variant interpretation. QCI Interpret takes your analytically valid variants and leverages the content in the QIAGEN Knowledge Base to guide scoring of your NGS variants. This is supported by our clinical content, including a comprehensive bibliography, clinical case counts, professional guidelines, drug labels and active clinical trials. The content is presented in a simplified user interface to promote fast and intuitive access to information relevant to your research, and enables editable classification of variant impact using the ACMG assessment guidelines. Our database contains over 10 million findings, 2 million ontology classes and 50 thousand disease-to-phenotype links.

GeneRead Assistant and GeneRead Link: Guiding you through the entire NGS workflow

GeneRead Assistant is your personal step-by-step guide to the complete GeneReader NGS System workflow, from nucleic acid extraction to data analysis and interpretation. This interactive iPad app consolidates all relevant information from handbooks and user manuals to provide you with a comprehensive overview of all steps of the workflow.

GeneRead Link is middleware that provides a complete chain of custody of your samples in the QIAGEN NGS workflow, from sample preparation to sequencing results. Pre-configured instrument interfaces guide you through work and loading instructions, while at the same time reducing manual interaction with respect to data handling. GeneRead Link works with standard operating protocols, tracks samples, archives results and reports from connected instruments, and then connects the NGS results to a Laboratory Information Management System (LIMS).

Quality management of samples designed for your convenience along the NGS workflow

You can be assured the sample being processed through the entire workflow is of the highest quality and the appropriate concentration, using our trusted and proven quality control tools. QIAGEN offers the QIAxpert® and QuantiMIZE Kits, with hardware and software for precise quantification of your sample, providing you with the capability to save and export experimental data.

Using the QIAxcel® alongside the QIAxcel High Resolution DNA Kit to check fragment sizing and concentration after target enrichment and library preparation, guarantees the accuracy of your results.

Guaranteed results and unparalleled service at predictable costs

Benefit from single vendor service for your complete NGS workflow with a single contract from your NGS partner, QIAGEN. We offer a complete package for installation, training and post-installation services with the GeneReader NGS System and ancillary equipment. This will enable you to focus on your results with peace of mind. Choose from the Basic, Full or Premium service options. Depending on your needs, we also offer in-depth training in NGS.

QIAGEN is the only company with a complete product suite across molecular science, and offers a comprehensive range of Sample to Insight solutions for molecular diagnostics. Therefore we are able to offer innovative business models that help you to predict and control your annual expenses. Our pricing for the GeneReader NGS System addresses fixed-cost constraints with price-per-insight pricing.

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at **www.qiagen.com** or can be requested from QIAGEN Technical Services or your local distributor.

The QIAGEN GeneReader® is for research use only. Not for use in diagnostic procedures.

Get the latest insight at **www.GeneReaderNGS.com**

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