Next-generation sequencing

Rapid, automated NGS solutions for infectious disease and microbiology research

Next-generation sequencing (NGS) is increasingly used in microbial research to identify and understand the evolution of infectious disease agents.

Approaches such as targeted NGS enable efficient identification of microbes within a mixed population. This helps improve research on outbreak samples, potential virulence factors and transmission patterns, and discovery of mutations that may be associated with drug resistance.

For a more comprehensive view, metagenomic sequencing is used to provide insights into the diversity and functions of microbial communities in different environments. It also aids in the discovery of new organisms, mutations, and pathogens, which is important for applications such as infection control surveillance, and research on wastewater and other environmental samples.

Custom Ion AmpliSeq™ solutions deliver NGS test results in as little as 24 hours

Ion AmpliSeq custom panels enable rapid detection and identification of microbes, utilizing a simple and automated NGS workflow. Ion AmpliSeq technology requires as little as 0.1 ng of input nucleic acid, making sequencing of limited-quantity or degraded samples routine on Ion Torrent™ sequencing systems.

Advantages of custom Ion AmpliSeq™ panels

Simple and versatile NGS panels
Targeted sequencing of viruses, bacteria, mycobacteria, and fungi from biological materials without culturing

Rapid NGS workflow with walkaway automation
Get NGS test results in as little as 24 hours with just 10 minutes of hands-on time

Scalable throughput
Different chip capacities for varying throughput needs without the need to batch samples

Flexibility to customize
Add or remove targets in any panel, or design your own made-to-order panel

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Versatile NGS panels for fast and easy surveillance, drug resistance testing, and microbial identification

Target sets of genes or entire microbial genomes with Ion AmpliSeq custom NGS panels. Choose from predesigned fixed panels, add and/or remove targets from an existing panel, or generate a completely custom panel design.

Custom Ion AmpliSeq panels for infectious disease and microbiology research

Epidemiology and surveillance research How is the microbe evolving and spreading?		Drug resistance research Does the microbe have mutations that affect drug resistance?	Identification and discovery research What microbe is causing infection?	
SARS-CoV-2[*,**] Epidemiology	**Mpox**[**] Epidemiology	***M. tuberculosis***[**] Drug resistance research	**Pan-bacterial**[**] HAI research	**Pan-respiratory**[**] Clinical research
Ebola[**] Epidemiology	**Mumps**[**] Epidemiology	**Antimicrobial resistance**[**] Drug resistance research	**Microbiome health**[*,**] Clinical research	**16S rRNA**[*,**] Clinical research
Zika[**] Epidemiology	**HCV**[**] Population epidemiology	**HIV**[**] Drug resistance research	**CMV**[**] Detection	**Rapid microbial ID**[*,**] Clinical research
			Cryptosporidium[**] Waterborne illness research	**Measles**[**] Clinical research
			18S rRNA[*,**] Fungal detection	

Off-the-shelf, predesigned fixed panels

Custom panel designs that can be shared upon request

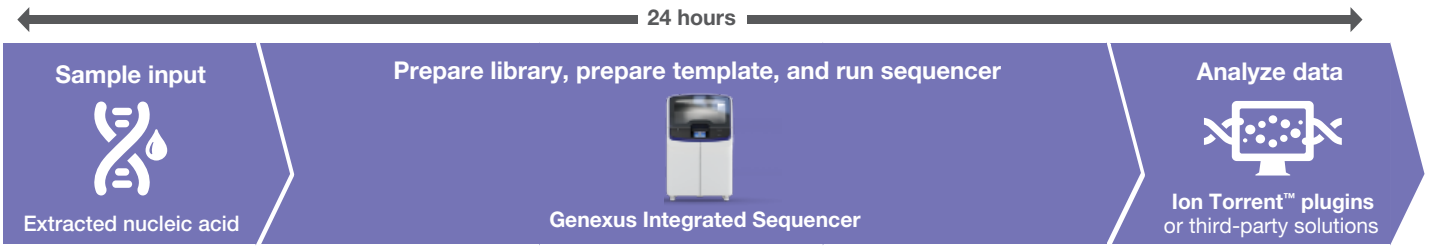
Stand-alone custom panel designs by other customers

* Compatible with Ion GeneStudio™ S5 systems.

** Compatible with the Ion Torrent™ Genexus™ Integrated Sequencer.

Rapid NGS workflow with walkaway automation

Developed to facilitate the democratization of NGS in laboratories worldwide, the Genexus Integrated Sequencer enables a simple workflow with NGS test results in as little as 24 hours. With just 10 minutes of hands-on time, experience walkaway automation for library preparation through sequencing.



Scalable throughput for fast and simple NGS

For laboratories requiring higher throughput, flexibility, and a broad application menu, Ion GeneStudio S5 systems enable scalability for multiple levels of throughput without the need to batch samples. The Ion Chef™ system, together with the Ion GeneStudio S5 sequencer, offers an automated workflow with 45 minutes of hands-on time and results in as little as 3 days.

Ion AmpliSeq targeted NGS predesigned panels

Select from available predesigned custom panels or modify as needed to suit your NGS testing needs. Ion AmpliSeq predesigned panels are designed by expert scientists on our R&D team, or in collaboration with world-leading disease researchers.

	Tuberculosis research panel	Ebola research panel	Antimicrobial resistance research panel	Pan-bacterial research panel	Pan-respiratory virus panel	SARS-CoV-2 Insight Research Assay
Type of panel	Drug resistance	Surveillance	Drug resistance and surveillance	Identification and drug resistance	Detection, identification, and surveillance	Surveillance
Description	Rapidly identifies mutations related to drug susceptibility of *M. tuberculosis*	Detects Ebola virus with >99% genome coverage	Sensitive, user-friendly method to assess antimicrobial resistance (AMR) diversity	Rapidly identifies bacteria and mutations related to antibacterial resistance	Detects the presence or absence of pathogens and identifies respiratory RNA viruses and strains	Detects SARS-CoV-2 with >99% genome coverage
Number of amplicons	109	145	815	1,009	183 primers	247
Number of pools	2	2	2	2	Single pool	2
Genes covered	8 genes related to antimicrobial resistance (*embB, eis, gyrA, inhA, katG, pncA, rpoB, rpsL*)	>99% of the Ebola virus genome	478 genes, representing antibiotic resistance markers in multiple bacterial species for 27 antibiotic classes	Pool 1: 21 species-specific genes + 364 AMR genes Pool 2: 16S profiling	26 respiratory viruses and strains including influenza H5N1 virus, enterovirus, rhinovirus, and SARS-CoV-2 and seasonal coronaviruses	Complete SARS-CoV-2 viral genome
Input required	10–100 ng DNA	10 ng RNA	5–10 ng DNA	5–10 ng DNA or cDNA	10 ng RNA	1–10 ng RNA

Ion AmpliSeq targeted metagenomic NGS predesigned panels

Select from available predesigned assays or modify as needed for your unique application. Ion AmpliSeq targeted metagenomic NGS panels are designed by experienced scientists on our R&D team.

	Rapid Microbial ID Panel	Microbiome Health Research Assay
Type of panel	Detection and identification	Detection and identification
Description	Metagenomic and targeted species-specific analysis of bacteria, mycobacteria, and fungi	Metagenomic and targeted species-specific analysis of bacteria
Number of amplicons	809	242
Number of pools	2	2
Genes covered	• Species-specific amplicons to identify 88 microbial species • 16S rRNA (8 out of 9 variable regions) • CLSI reference primers for fungal ITS and D1/D2 regions of the fungal 28S large ribosomal subunit • *rpoB* for bacterial and mycobacterial detection	• Detects and quantifies all species in sample through 16S gene sequencing (8 of 9 HV regions) • Detects and quantifies 73 key species implicated in immuno-oncology response, gut health, and auto-immunity
Input required	0.1 ng/µL (25 µL total)	0.11 ng/µL (25 µL total)

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Flexibility to customize panels to meet your needs

Don't see what you're looking for? No problem. Design a custom DNA or RNA made-to-order panel suitable for your laboratory's specific requirements. Our experienced team of professionals will support you with everything from panel design to bioinformatics and analytical validation.*

* Consulting services offered for the guidance in enabling the analytical validation in support of research efforts only.

Contact your sales representative to learn more, or contact us at **thermofisher.com/ampliseq-quote** to request pricing details.

Learn more about Ion AmpliSeq solutions at **thermofisher.com/ampliseq**

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