





# Ion AmpliSeq panels for infectious disease research

The use of next-generation sequencing technologies has transformed our ability to identify and understand the evolution of infectious disease agents. Through the use of targeted sequencing of specific genes, researchers are now able to efficiently identify the microbes within a mixed population, perform research on retrospective outbreak samples, study potential virulence factors and transmission patterns, and discover mutations that may be associated with drug resistance in the future.

## Fastest targeted sequencing workflow

Targeted sequencing becomes simpler than ever when performed with Ion AmpliSeq™ technology for target selection and library construction. Based on ultrahigh-multiplex PCR, Ion AmpliSeq technology requires as little as 1 ng of input nucleic acid to target sets of genes, making sequencing of limited-quantity or degraded samples routine on Ion Torrent™ sequencing systems (Figure 1).

Construct library	Prepare template	Run sequence	Analyze data
Total time: 5.5 hours	Total time: 11 hours	Total time: 2.5 hours	Total time: 2.5–5 hours
			
Ion AmpliSeq panels for infectious disease research	Ion Chef System	Ion S5 System	Torrent Suite Software

**Figure 1. Ion AmpliSeq workflow.** Ion AmpliSeq libraries are prepared manually or with the Ion Chef System. Libraries are then placed in the Ion Chef System for emulsion PCR, enrichment, and loading onto Ion S5™ Chips.

- **Fastest targeted sequencing workflow**—sample to data in less than 24 hours
- **Content for all**—targeted sequencing of viruses, bacteria, or fungi from biological materials without culturing
- **Scalability**—panels of varying sizes with different chip capacities to scale to your research needs

“We needed a workflow that is robust and is relatively straightforward, so the Ion AmpliSeq Ebola Research Panel was perfect for what we wanted to do.”

**Professor Ian Goodfellow**  
University of Cambridge

## Content for all

Ion AmpliSeq technology provides a simple enrichment method for targeted sequencing of archived biological materials that have not been cultured. It is highly effective in identifying variants without the time and cost associated with more comprehensive approaches such as whole genome sequencing or multilocus sequence typing (MLST), which require pure samples. Choose from predesigned community panels (Table 1), or customize your own panel to your own private reference genome using the Ion AmpliSeq™ Designer. Made-to-order panels are typically delivered in 2–4 weeks.

## Scalability for your dynamic research needs

The combined power of Ion AmpliSeq technology and Ion Torrent sequencing provides a scalable targeted sequencing system to fit your research needs. Multiple Ion chips offer different sequencing capacities, so that

experiments can be run cost-effectively without the need to batch samples. Additionally, with the Ion S5™ Systems, you can sequence gene panels as well as viral and bacterial genomes on a single benchtop instrument rapidly and efficiently (Table 2).

**Table 1. Ion AmpliSeq panels for infectious disease research.**

Organism	<i>Mycobacterium tuberculosis</i> (TB)	Ebola virus (EBOV)
<b>No. of amplicons</b>	109	145
<b>No. of pools</b>	2	2
<b>Genes targeted</b>	<i>embB</i> , <i>eis</i> , <i>gyrA</i> , <i>inhA</i> , <i>katG</i> , <i>pncA</i> , <i>rpoB</i> , <i>rpsL</i>	99.49% of the EBOV genome
<b>Input required</b>	10–100 ng DNA	10 ng RNA
<b>Recommended no. of samples for multiplexing</b>	36 per Ion 520 Chip (1,000x coverage)	13 per Ion 520 Chip (2,000x coverage)

**Table 2. Ion S5 Chip throughput.**

		Ion 520™ Chip	Ion 530™ Chip	Ion 540™ Chip
<b>Output</b>	200 bp	0.6–1 Gb	3–4 Gb	10–15 Gb
	400 bp	1.2–2 Gb	6–8 Gb	–
<b>Reads</b>		3–5 million	15–20 million	60–80 million

## Ordering information

Name	Description	Size	Cat. No.
<b>Panels</b>			
<b>Ion AmpliSeq TB Research Panel</b>	Targeting genes associated with antimicrobial resistance in <i>M. tuberculosis</i> (TB). The panels amplify 109 amplicons (two pools) from 8 genes related to antimicrobial resistance ( <i>embB</i> , <i>eis</i> , <i>gyrA</i> , <i>inhA</i> , <i>katG</i> , <i>pncA</i> , <i>rpoB</i> , <i>rpsL</i> ). The panel enables assessment of sputum culture extractions.	Custom order	Order at <a href="http://ampliseq.com">ampliseq.com</a>
<b>Ion AmpliSeq Ebola Research Panel</b>	Targets genes of the Ebola virus. The panel enables assessment of 145 amplicons across the Ebola virus genome.	Custom order	Order at <a href="http://ampliseq.com">ampliseq.com</a>
<b>Manual Ion AmpliSeq library preparation</b>			
<b>Ion AmpliSeq Library Kit 2.0</b>	Manual Ion AmpliSeq library preparation	8 reactions	4475345
		96 reactions	4480441
		384 reactions	4480442
<b>Ion Xpress™ Barcode Adapters 1-96 Kit</b>	96 unique barcode adapters	1 kit	4474517
<b>Ion Library Equalizer™ Kit</b>	Bead-based solution replacing the need for library quantification and library dilutions for library normalization	96 reactions	4482298
<b>Automated library preparation</b>			
<b>Ion AmpliSeq Kit for Ion Chef DL8</b>	Automated Ion AmpliSeq library preparation supplied with IonCode™ barcodes	4 x 8 reactions	A29024

Find out more at [thermofisher.com/ioninfectiousdisease](http://thermofisher.com/ioninfectiousdisease)

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