

iontorrent



## Ion Chef System

Walk-away convenience  
with automated workflows

**ThermoFisher**  
SCIENTIFIC



# Streamline your next-generation sequencing workflow

Help save time at the bench, improve your laboratory's productivity, and standardize your results.

The Ion Chef™ System does the repetitive lab work without the need for complex robotics and confusing scripts. Paired with Ion Torrent™ next-generation sequencing platforms (Ion PGM™, Ion PGM™ Dx system—assay development mode, Ion Proton™, and Ion S5™ Systems), the Ion Chef System automates Ion AmpliSeq™ library preparation, template generation, and chip loading with push-button simplicity—enabling DNA to data in as little as 45 minutes of hands-on time.

Suitable for any user in the lab interested in microbial metagenomics, gene expression analysis, exome sequencing, or targeted sequencing, the automated workflows of the Ion Chef System help save time at the bench, increase lab productivity, and help standardize results. Unleash the power of your Ion Torrent™ next-generation sequencing platform with Ion Chef System automation.

“We’re very pleased with the run quality, and the time savings are impressive.”

—Brad Hancock, Indiana University



# Simplest workflow for targeted sequencing

Combine the Ion Chef System with an Ion S5 System for the pinnacle in next-generation sequencing simplicity. With as few as 5 pipetting steps, go from DNA to data with just 45 minutes of hands-on-time. Next-generation sequencing has never been simpler.

Now you can shift your attention from wet-laboratory work to data interpretation and next actions.

## Sequencing workflow



**Ion Chef System**



**Ion Torrent sequencing systems**



**Torrent Suite and Ion Reporter Software**

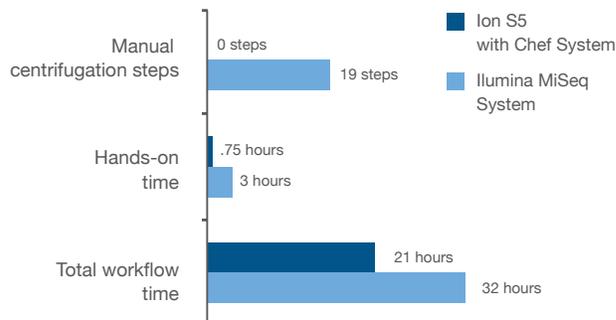
<b>3 pipetting steps</b> <b>15 minutes setup time</b>	<b>2 pipetting steps</b> <b>15 minutes setup time</b>	<b>0 pipetting steps</b> <b>15 minutes setup time</b>	<b>No setup required</b>
7 hours run time	11 hours run time (overnight)	2.5 hours run time	Analysis time varies
Supports Ion Ampliseq 1- or 2-pool panel designs	Supports all Ion Torrent libraries and sequencers	Supports chips for Ion Torrent Sequencing Systems	Supports all Ion Torrent sequencing data and a broad variety of applications

Learn more about the Ion Chef System at [thermofisher.com/ionchef](http://thermofisher.com/ionchef)

### More time to get research done

Free yourself from the repetitive work of preparing samples.

- **15 minutes setup time per run**—when combined with the Ion S5 System, go from DNA to data with just 45 minutes of total hands-on time (Figure 1)
- **Prepare up to 8 Ion AmpliSeq libraries or 2 sequence-ready Ion chips per run**—process multiple samples and chips in parallel; helps save time and cost



**Figure 1. Comparison of the Ion Chef/Ion S5 system combination with the Illumina MiSeq System.** The combination of Ion Chef and Ion S5 Systems delivers data 30% faster with 75% less hands-on time. (Workflow metrics compiled from respective product User Guides.)

### Suitable for researchers of any experience level

From reagents to runs, you can simplify your library and template preparation for the Ion Torrent next-generation sequencing workflow.

- **Single-use reagent cartridges**—prepackaged and ready-to-go reagent cartridges minimize pipetting errors and fit in a single correct deck location
- **Intuitive graphic user interface**—simply select the run parameters on the touch-screen interface and hit “go” (Figure 2)

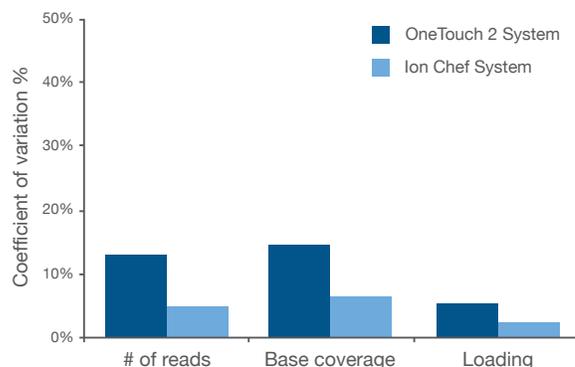


**Figure 2. The simple graphical user interface makes it intuitive and quick to set up a run on the Ion Chef System.**

### Confidence in sequencing results

Now you can reduce day-to-day variation in manual lab workflows, to help provide consistent results, peace of mind, and confidence in your data.

- **On-board reagent tracking**—2D barcodes associated with all reagents and consumables minimize the potential for user error and help ensure every run is set up correctly (Figure 3)
- **Reproducible results**—minimal user pipetting helps reduce user-introduced experimental variability



**Figure 3. Comparison of reproducibility across several next-generation sequencing metrics for Ion libraries processed (templating and chip loading) using the Ion Chef and Ion OneTouch™ 2 Systems.** While both systems exhibit excellent reproducibility, the Ion Chef System demonstrates lower coefficients of variation across all metrics.

# Pair with the power of Ion AmpliSeq technology

## Ion AmpliSeq technology

Ion AmpliSeq™ technology applies the simplicity of PCR to targeted sequencing. PCR primer design and chemistry enable tens to thousands of genomic regions of interest to be amplified simultaneously in a single PCR tube. So whether you want to target a few exons, a few genes, or a whole exome, Ion AmpliSeq technology scales with the same robust performance as simple PCR. Covering a spectrum of applications, Ion AmpliSeq technology is being applied to the fields of oncology, inherited diseases, human identification, infectious diseases, and pharmacogenomics. You can count on this highly referenced technology—cited by hundreds of publications in just 3 years—for consistent and robust library preparation.

## Choose from our extensive menu or customize

Whether you select from our extensive menu of predesigned gene panels or create your own custom panel from scratch, your panel will enable high coverage and performance. Our online Ion AmpliSeq™ Designer tool puts you in the driver's seat, enabling customized designs for DNA, RNA, and gene fusion targets. Modify a preexisting gene panel or start from scratch by choosing from one of twelve reference genomes or upload a reference sequence of your own for design. Optimized for coverage across selected genomic regions and amplicon sizes, our Ion AmpliSeq Designer tool uses the same powerful design engine employed to create our predesigned panels to help deliver superior performance and results.

Go to [thermofisher.com/ampliseq](https://thermofisher.com/ampliseq) for more details.



**10 ng of DNA  
or RNA**

For low-quality,  
low-input samples

“We ran both cell-free and FFPE-derived DNA and both look excellent—we observed 100% concordance between the manual and automated workflows.”

—José Luis Costa,  
IPATIMUP



## Ion AmpliSeq panels compatible with automated library preparation workflow

Regardless of the library preparation method used, all Ion Torrent™ sequencing libraries are compatible with the template preparation and chip loading workflow.

Research area	Ion AmpliSeq panel (DNA)	Genes covered	Chip for 8-sample multiplexing
Inherited disease	Inherited Disease Panel	325	Ion 540 chip
	Cardiovascular Research Panel	404	Ion 540 chip
	Hematology Research Panel	394	Ion 540 chip
	Neurological Research Panel	757	Ion 540 chip
	Ophthalmic Research Panel	330	Ion 540 chip
	Deafness Research Panel	124	Ion 530 chip
	Dermatology Research Panel	214	Ion 530 chip
	Dysmorphia-Dysplasia Research Panel	389	Ion 540 chip
	Endocrinal Panel	310	Ion 530 chip
	Gastrointestinal Research Panel	189	Ion 530 chip
	Inborn Errors of Metabolism Research Panel	570	Ion 540 chip
	Primary Immune Deficiency Research Panel	266	Ion 530 chip
	Pulmonary Research Panel	130	Ion 530 chip
	Renal Research Panel	96	Ion 318/Ion 520 chip
	Hearing Loss Research Panel v1	63	Ion 318/Ion 520 chip
	Dementia Research Gene Panel	17	Ion 314 chip
	Noonan Research Panel	14	Ion 314 chip
	<i>TP53</i> Research Panel	1	Ion 314 chip
	<i>CFTR</i> Research Panel	1	Ion 314 chip
	PGx	Pharmacogenomics Research Panel	40
Oncology	Cancer Hotspot Panel v2	50	Ion 530 chip
	Colon and Lung Cancer Panel v2	22	Ion 316 chip
Infectious disease	TB Research Panel	8	Ion 314 chip
HID	Ancestry Panel*	165**	Ion 316 chip
	Identity Panel*	124**	Ion 314 chip
Research area	Ion AmpliSeq panel (RNA)	Genes covered	Chip for 8-sample multiplexing
Gene expression	Transcriptome Human Gene Expression Research Panel	20,802	Ion 540 chip
Oncology	RNA Apoptosis Panel	267	Ion 540 chip
	RNA Cancer Panel	50	Ion 318/Ion 520 chip
	RNA Lung Fusion Panel	85	Ion 318/Ion 520 chip
Infectious disease	Ebola Research Panel	150	Ion 314 chip

\* Compatible for automated templating and chip loading. Automated library preparation coming soon.

\*\* Number refers to markers and not genes.

As our menu of predesigned panels grows, view the most current panel content and detail information at [ampliseq.com](http://ampliseq.com)

# Service and support at every step

## Select a service plan to fit your needs

Whether you are sequencing for a client or your own internal study, instrument downtime can have serious implications on meeting your commitments. Choose from our range of service options to find a suitable solution for your budget to help you achieve your productivity goals and, if required, help meet regulatory requirements. During the warranty period, all repairs as well as engineer time and travel costs are covered. Our on-site service plans include guaranteed response times

(depending on region) and scheduled planned maintenance services so that you can maximize instrument uptime, making them ideal for labs that have time-sensitive work.

## Manage your instrument maintenance online

Register your new instrument with our online Instrument Management Tool to easily receive instrument software, patches, and updates, plus visibility to key instrument and service information.

# Professional services to help accelerate your goals

## Compliance and validation services

If your laboratory needs to comply with regulatory requirements, we can perform a risk assessment and hardware/software qualification to full system validation to help you establish your processes and mitigate regulatory risks.

## Training courses

Our application and instrument training programs are led by scientists who aim to enhance the standards of your sequencing output through experimental design best

practices, workflow training, and instrument troubleshooting. You can sign up for hands-on classes at our Thermo Fisher Scientific training centers, or we can come to you and train your entire laboratory. For more information, go to [thermofisher.com/training](http://thermofisher.com/training)

## Safely manage data with data storage solutions

Our IT and bioinformatics support teams are here to meet your needs and develop a cost effective and secure DataSafe™ Storage Solution for your laboratory or institute. For more information, go to [thermofisher.com/datasafe](http://thermofisher.com/datasafe)

Access more service and support details at  
[thermofisher.com/instrumentservices](http://thermofisher.com/instrumentservices)