

GenomeTrakr Meeting

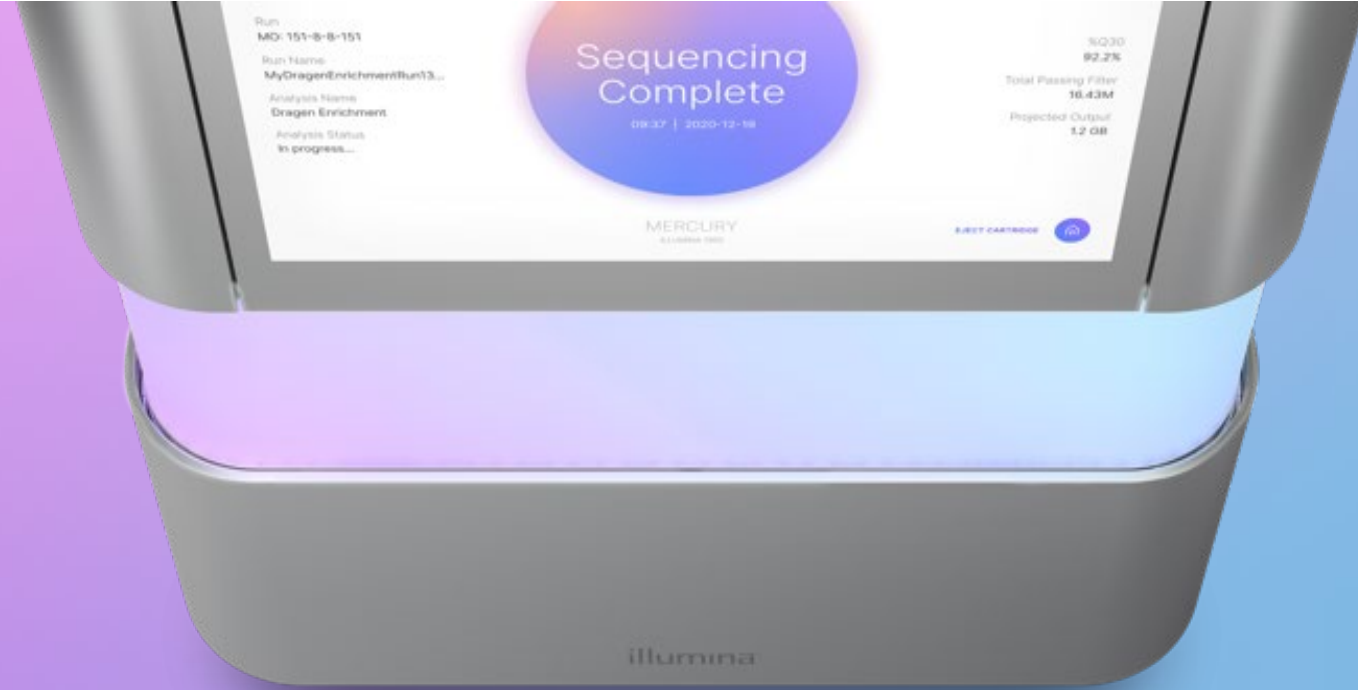
10/25/23

Jason Smith

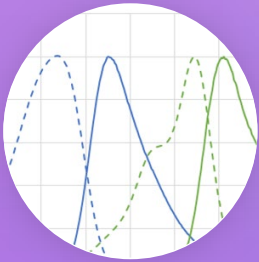
Infectious Disease and Microbiology Specialist

Innovative platform development for supporting customer applications

	2011	2012	2013	2014	2015	2016	2017	2018	2020	2022
High-throughput		 HiSeq 2500 Allowed Rapid Run Mode for higher throughput needs		 HiSeq X Ten Enabled the \$1K genome	 HiSeq 3000/4000 Broadened high throughput sequencing applications		 NovaSeq 6000 Significantly increased data output		 NovaSeq X Series Dramatically expands sequencing capabilities	 NovaSeq 6000Dx* First high throughput FDA-registered, CE-marked IVD system
Mid-throughput				 NextSeq™ 500 First benchtop powered by 2-channel SBS	 NextSeq 550 Combined microarray scanning with NGS		 NextSeq 550Dx* FDA-registered and CE-IVD marked for clinical research and IVD assays ²		 NextSeq 1000/2000 Super resolution optics and Blue/Green SBS	
Low-throughput	 MiSeq Benchtop sequencer, giving broader access to NGS		 MiSeq Dx* First NGS platform to be FDA cleared for IVD testing ¹			 MiniSeq™ Made rapid runs accessible for benchtop sequencing			 iSeq™ 100 Most compact system under \$20k	



> 75 Breakthrough Innovations



**Blue, 2
Channel SBS**



**Super Resolution
Optics**



**Ultra-high Density
Patterned Flow Cells**



**Integrated DRAGEN
Bio-IT Platform**



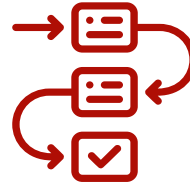
**Single Integrated
Cartridge**

User-centric design for operational simplicity



Streamlined run set-up

Easy push-button interface for on-instrument run set-up and monitoring



Minimized hands-on and TAT

Onboard cluster generation included in sequencing run times limiting additional equipment



Efficient digital workflow

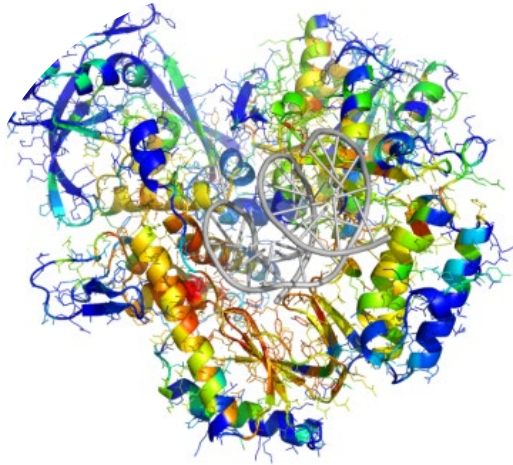
Automated FASTQ file compression for faster turn-around-times



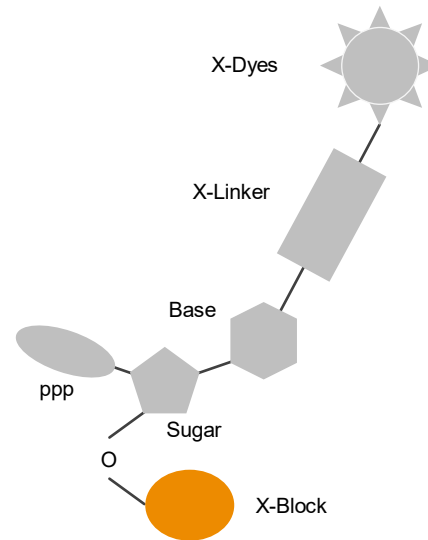
Thoughtful packaging

Compact simplified reagent design reducing storage footprint

XLEAP-SBS™ Chemistry



Novel Polymerase



X-Block, X-Linker, X-Dyes



Faster cycle times



Greater accuracy



Higher Throughput

NextSeq 1000/2000 with XLEAP-SBS™ Chemistry will unlock the next level of scale, cost efficiency and capabilities



*Available only on the NextSeq 2000. **Preliminary spec target only. 500Gb for P4 300c kit.

P4 powered by XLEAP-SBS Chemistry on NextSeq 2000

A variety of read lengths for application flexibility at scale

P4 available to order Q1 2024
~1.7B Clusters

50 cycles

~83 Gb

100 cycles

~167 Gb

200 cycles

~333 Gb

300 cycles

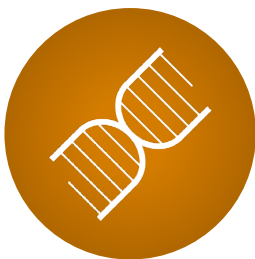
~500 Gb

≤48 hrs



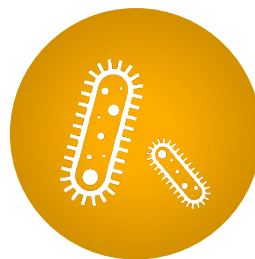
Illumina DNA Prep

Flexible sample input for small genomes



gDNA

User guide & kit
supported process



Microbial colony

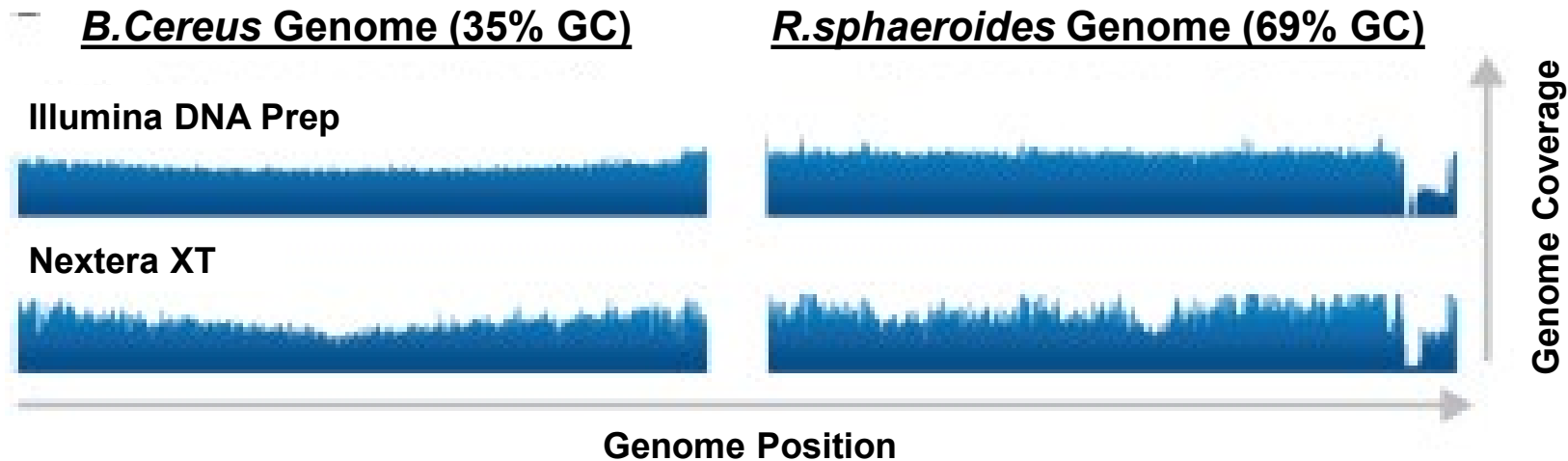
Demonstrated
protocols available
at [Illumina.com](https://www.illumina.com)



No extra DNA quantification step required post DNA extraction

Illumina DNA Prep vs Nextera XT

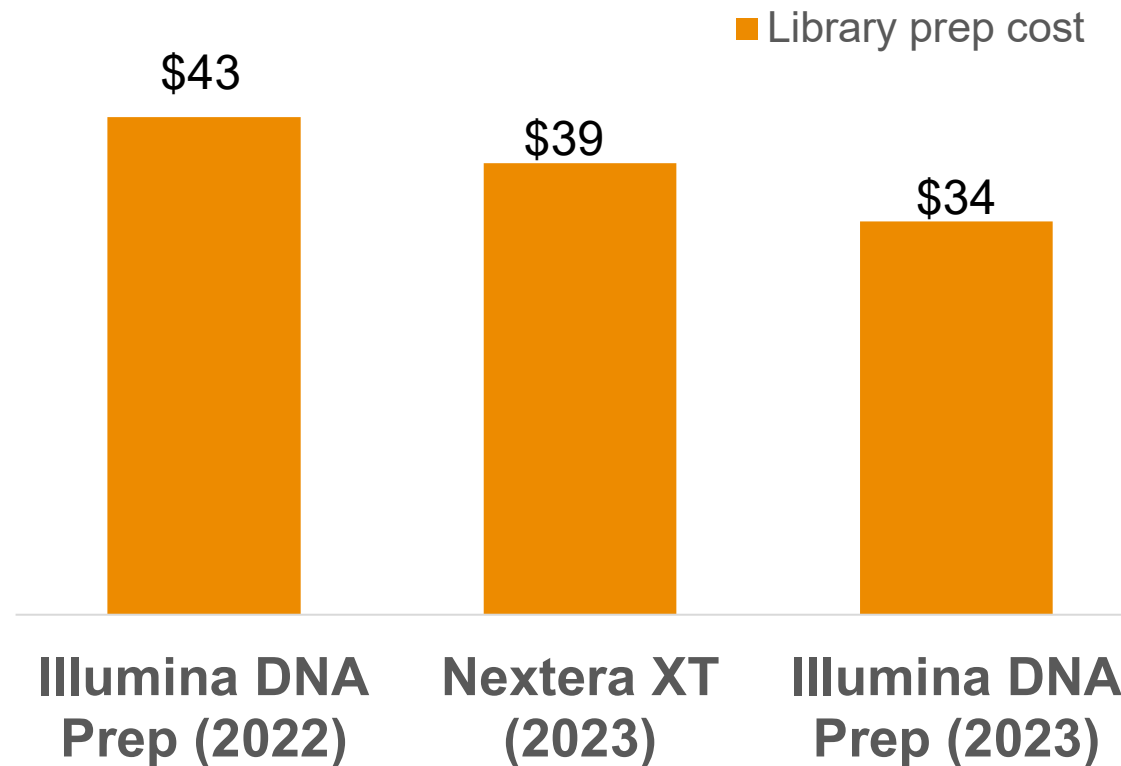
Comparative Integrative Genomics Viewer (IGV) coverage plots in bacteria*



- Illumina DNA Prep provides greater uniformity in both AT/GC rich microbial species.

Illumina DNA Prep Pricing Comparison

Price Reduction
Feb 15, 2023



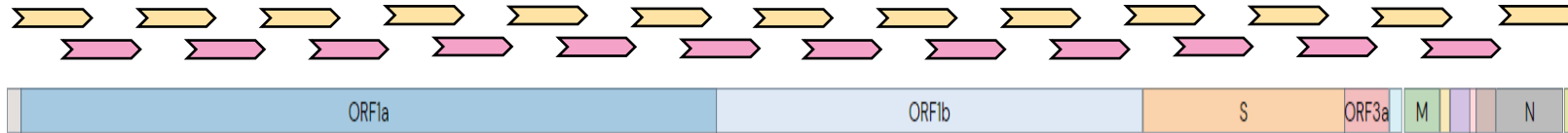
Illumina® COVIDSeq



98+ Viral
Amplicons
(full sequence)



384 to 3,072
Samples per run



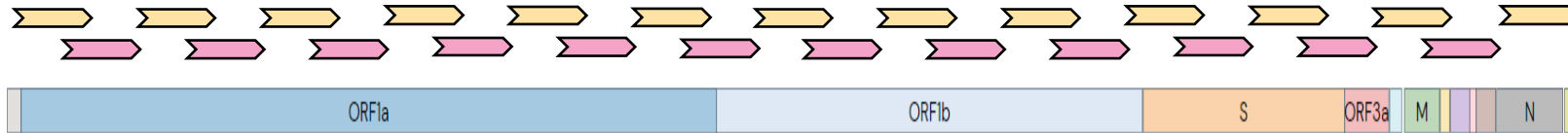
Illumina® IMAP : A Universal Approach



N
Amplicons



Example:
Flu, RSV, MPXV, ++



IMAP utilizes a standard Illumina NGS workflow



Sample extraction/QC

Tested with 3rd party solutions



Library preparation

**IMAP
or
IMAP-Flu**



Sequencing

**iSeq™ 100
MiniSeq™
MiSeq™
NextSeq™**



Analysis

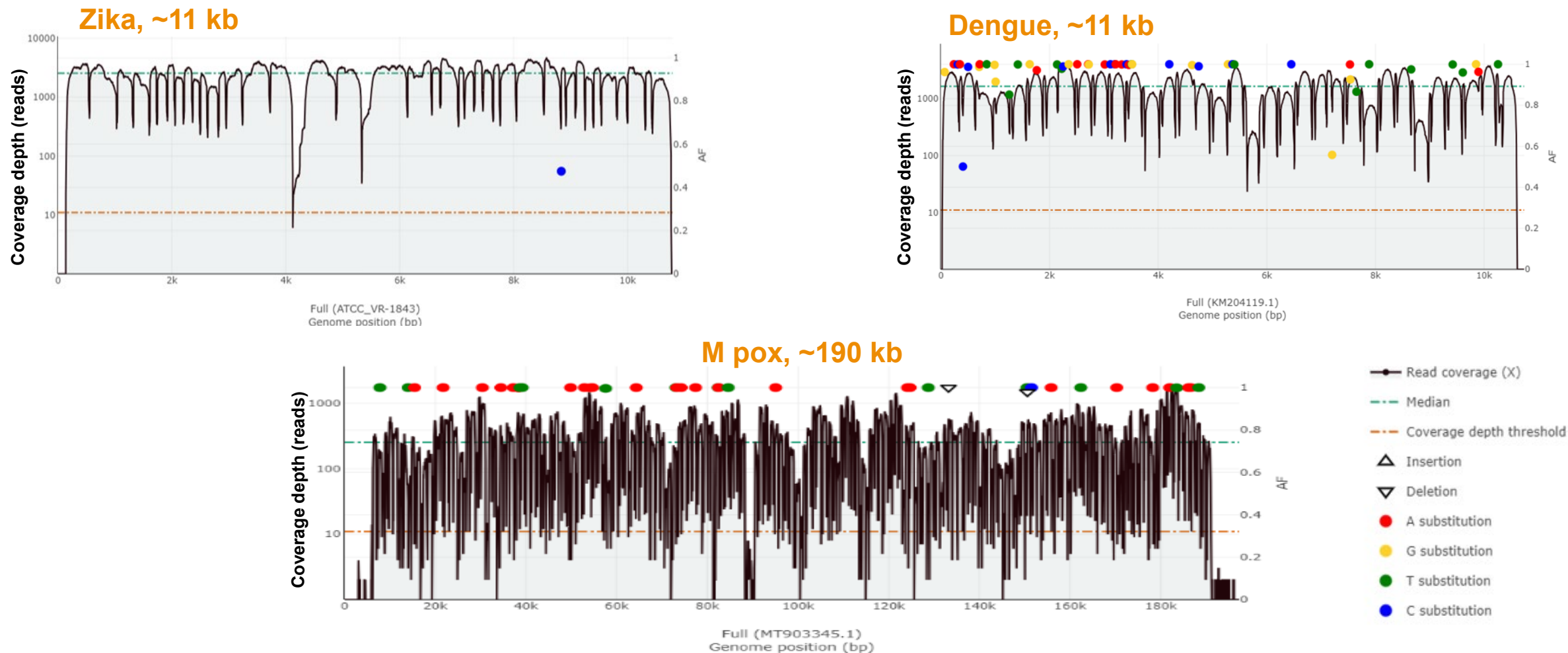
BaseSpace™



DRAGEN Targeted Microbial
BaseSpace Labs

IMAP : Illumina Microbial Amplicon Prep

Performance



IMAP : Published Protocols

Illumina Tested ¹	Customer Demonstrated
Chikungunya	Dengue I-IV ²
RSV	Lumpy skin disease ³
SARS-CoV-2: ARTIC v4	Mpox ⁴
Zika	RSV ⁵
Influenza	SARS-CoV-2: ARTIC v4.1 ⁶ & v5.3.2 ⁷

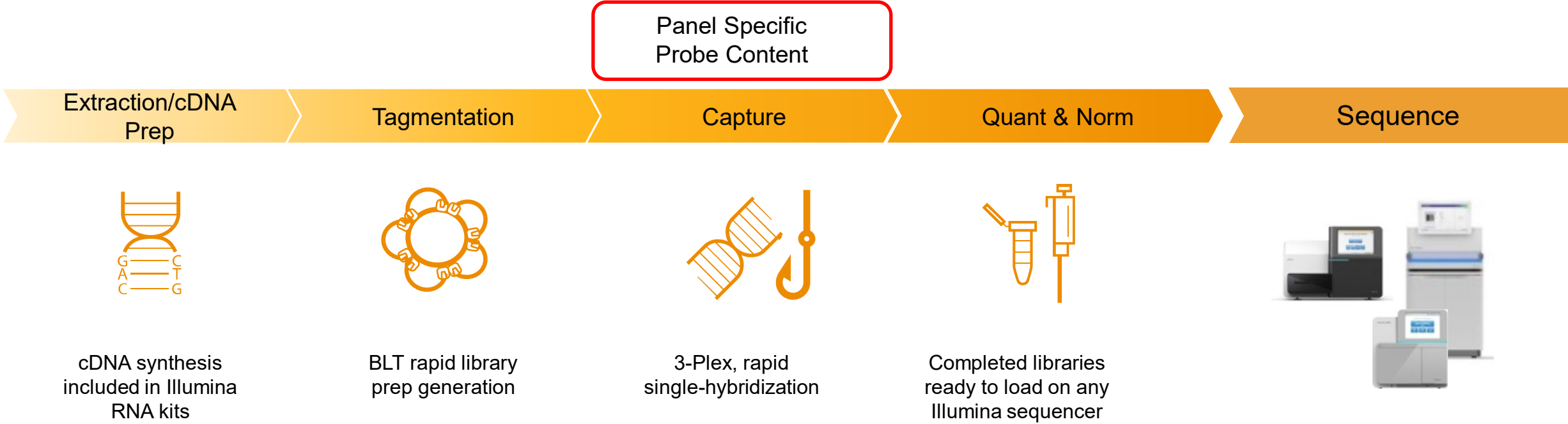
Additional online resources

- Protocols.io
- Biorxiv.org

1. Data on file
2. <https://dx.doi.org/10.17504/protocols.io.kqdg39xxeg25/v2>
3. <https://doi.org/10.1101/2022.09.15.508131>
4. <https://dx.doi.org/10.17504/protocols.io.5qpvob1nbl4o/v4>
5. <https://dx.doi.org/10.17504/protocols.io.eq2lyjzbrlx9/v2>
6. <https://community.artic.network/t/sars-cov-2-v4-1-update-for-omicron-variant/342>
7. <https://community.artic.network/t/sars-cov-2-version-5-3-2-scheme-release/462>

Precision Metagenomics

Workflow



Modular 3-plex configuration allows for cost-efficient scalability

Urinary Pathogen Identification Panel (UPIP)

Powered by Explify™ UPIP

174

Pathogens



14

fungi



35

viruses



4

parasites



121

bacteria

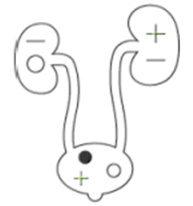
46

Antibiotics

3,728

Antimicrobial Resistance Markers

explify®

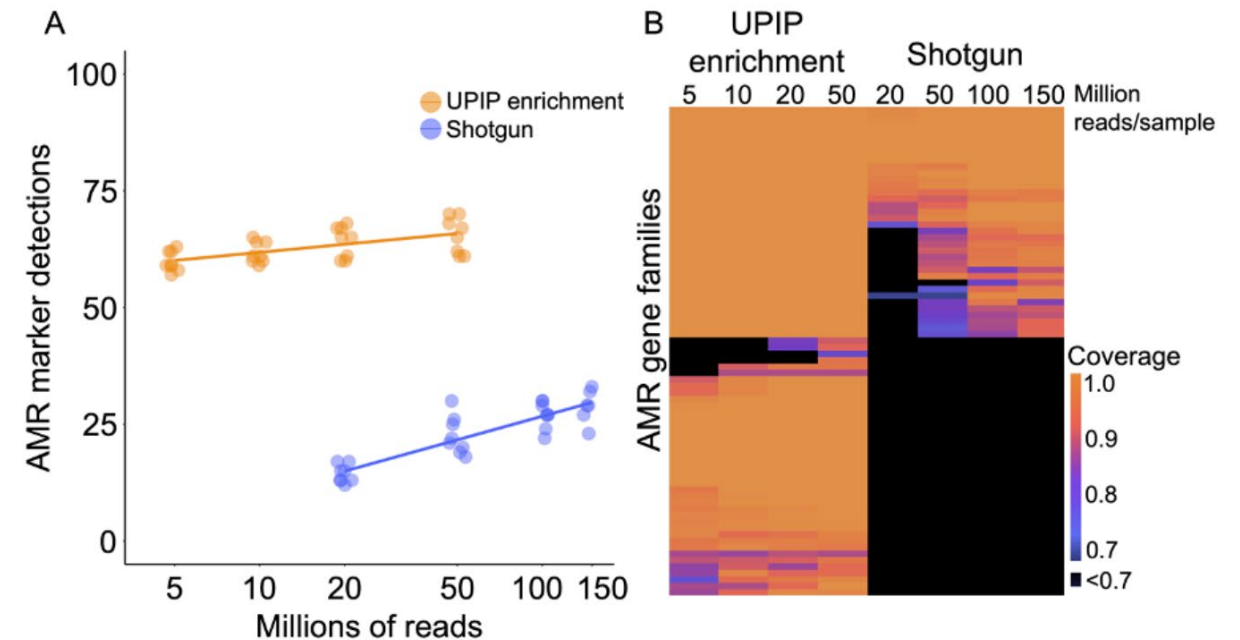


Wastewater AMR surveillance with a broad probe-capture precision metagenomics (PMG) panel

Jacob Bierstedt, Morgan Roos, Scott Kuersten, Courtney Gonzalez, Kate Broadbent

Increased AMR yield with UPIP

- > 2500X more reads
- > 3500X more read depth
- > 3X detections



<https://www.illumina.com/science/genomics-research/articles/UIPIP-wastewater-surveillance.html>

Metagenomics
Sequencing

Illumina
DNA Prep

Whole
Genome
Sequencing

COVIDSeq
Assay & Test

Illumina Microbial
Amplicon Prep

Illumina and GenoScreen
Deeplex Myc-TB Combo kit

Respiratory
Viral Enrichment Kit

Pan-
Corona
Virus Panel

Viral
Surveillance
Panel

Respiratory
Pathogen
ID/AMR Panel

Urinary Pathogen
ID/AMP Panel

Illumina ID&M Portfolio

From single organism
to discovery

DISCOVERY
SINGLE GENOME
MULTI-PATHOGEN

