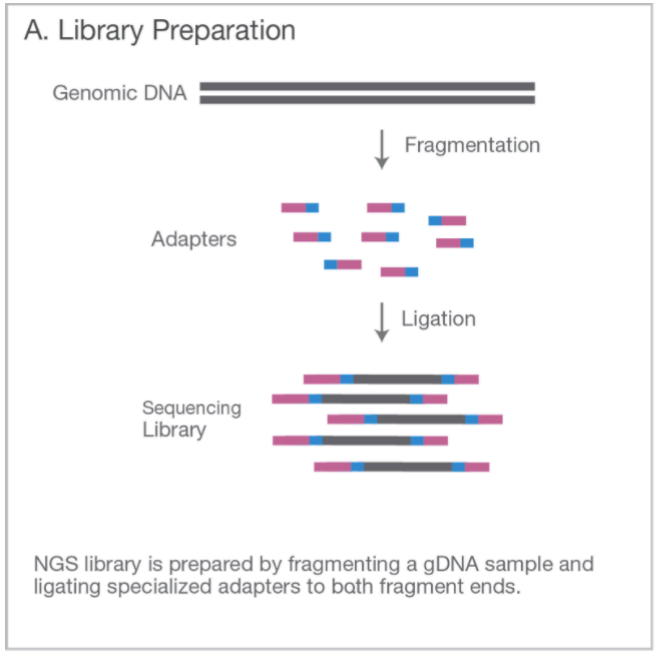
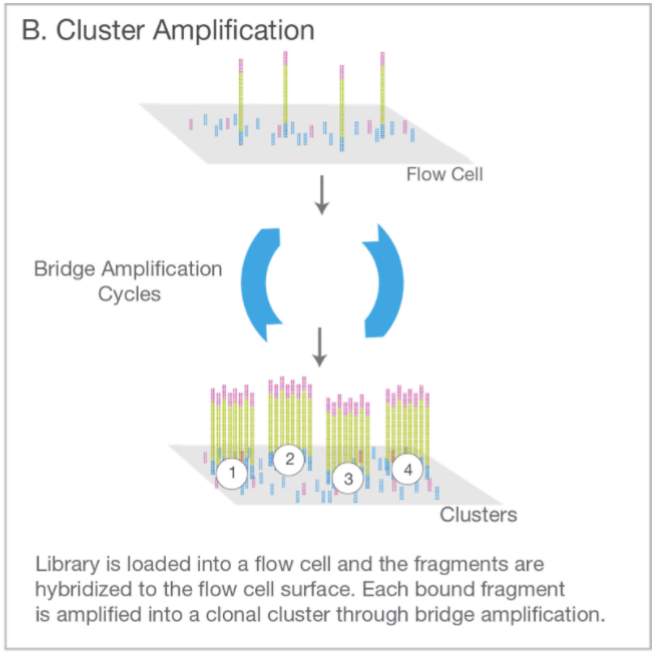
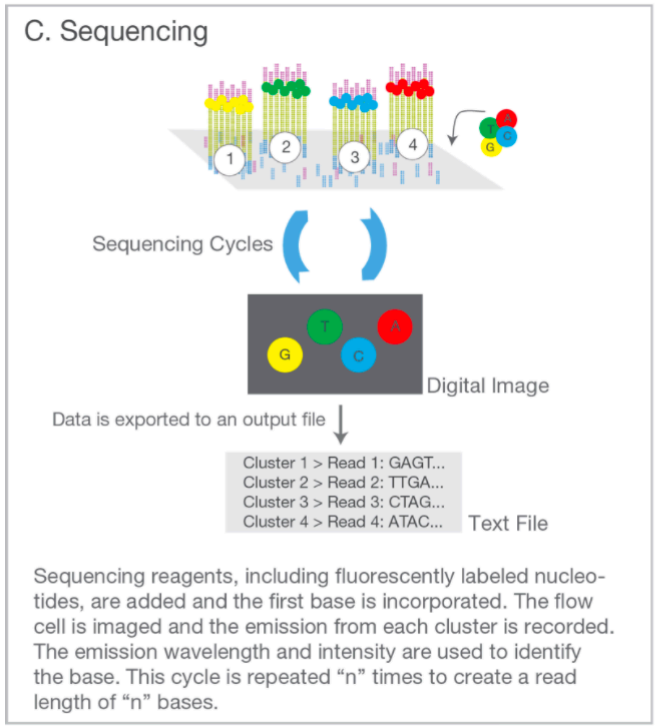
ILLUMINA WORKFLOW

- Illumina uses a technology called Sequencing by Synthesis
- DNA polymerase catalyzes the incorporation of fluorescently labeled deoxyribonucleotide triphosphates (dNTPs) into a DNA template strand during sequential cycles of DNA synthesis.
- During each cycle, at the point of incorporation, the nucleotides are identified by fluorophore excitation.







What can you do with the Illumina platform?

- Small Whole-Genome Sequencing (microbe, virus) (all models).
- Large Whole-Genome Sequencing (human, plant, animal) (NextSeq models and beyond).
- Exome Sequencing (NextSeq models and beyond).
- Targeted Gene Sequencing (amplicon, gene panel) (all models).
- Whole-Transcriptome Sequencing (NextSeq models and beyond).
- Gene Expression Profiling with mRNA-Seq (NextSeq models and beyond).
- Methylation Sequencing (NextSeq models).
- Metagenomics.
- 16S Metagenomic Sequencing (MiSeq System & NextSeq models).

SELECTING THE BEST SYSTEM FOR THE TASK

- Small Whole-Genome Sequencing & Targeted Sequencing

	 MiniSeq	 MiSeq*	 MiSeqDx†	 NextSeq*	 NextSeq 550Dx†
Output Range	1.8-7.5 Gb	0.3-15 Gb	0.3-1.5 Gb	20-120 Gb	≥90 Gb
Run Time	4-24 hr	5-55 hr	4-55 hr	11-29 hr	<35 hr
Reads per Run	8-25 million	1-25 million	1-25 million	130-400 million	≥300 million
Maximum Read Length	2 × 150 bp	2 × 300 bp	2 × 300 bp	2 × 150 bp	2 × 150 bp
Samples per Run§	1-384	1-384	N/A	96	8-96 samples/run depending on assay
Relative Price per Sample§	Higher Cost	Mid Cost	Mid Cost	Lower Cost	Lower Cost
Relative Instrument Price§	Lower Cost	Mid Cost	Mid Cost	Higher Cost	Higher Cost

SELECTING THE BEST SYSTEM FOR THE TASK

- Large Whole-Genome Sequencing & RNA-Seq

	NextSeq*	NextSeq 550Dx†	HiSeq 4000*	NovaSeq 6000*††
Output Range	20-120 Gb	≥90 Gb	125-1500 Gb	134-6000 Gb
Run Time	11-29 hr	<35 hr	<1-3.5 days	13-44 hr
Reads per Run	130-400 million	≥300 million	2.5-5 billion	Up to 20 billion
Maximum Read Length	2 × 150 bp	2 × 150 bp	2 × 150 bp	2 × 150 bp
Samples per Run‡	1	8-96 samples/run depending on assay	6-12	4-48
Relative Price per Sample‡	Higher Cost	Higher Cost	Mid Cost	Lower Cost
Relative Instrument Price‡	Lower Cost	Lower Cost	Mid Cost	Higher Cost

Sequencing systems for every lab

The iSeq came out recently and costs ca. $20k

iSeq | MiniSeq | MiSeq | NextSeq | HiSeq | HiSeq X | NovaSeq

KEY APPLICATIONS

Targeted Gene Sequencing	Small Whole-Genome Sequencing	Long-Range Amplicon Sequencing
WITH GENE PANEL OR AMPLICON METHODS	FOR MICROBIAL/VIRAL GENOMES	FOR CONTIGUOUS DNA REGIONS ≤ 20 KB

The most affordable Illumina system, designed for everyday sequencing.