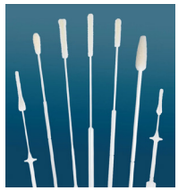
Next Gen Sequencing Workflow Guide

Thomas Scientific

1 - Sample Collection

Biological samples are drawn from subjects via nasopharyngeal swab, blood, saliva, or another medium. The type of sample required depends on the research application and instrumentation used.

Transport Media
(i.e. NEST)



Swabs
(i.e. Copan)

2 - DNA Extraction

The purpose here is to isolate DNA from captured samples. Common methods include magnetic bead, spin column, and resin. Purification is also performed here.

Extraction Kits
(i.e. Agilent Genomics)

Magnetic Beads
(i.e. MP Bio)

3 - Shearing

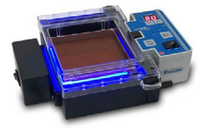
DNA is cleaved to the appropriate fragment range in order to ensure sensitive and accurate sequencing. Purification is also performed here.

Sonicators
(i.e. Advantech)

Spin Columns
(i.e. MilliporeSigma)

4 - Size Selection

Ensuring sheared DNA is within the optimum range for a given instrument (typically 200-500 bp for Illumina systems). Methods include enzymatic, gel-based, and magnetic bead.



Gel Electrophoresis
(i.e. Benchmark Scientific)

NGS Beads
(i.e. Omega Bio-tek)

5 - Library Prep

Adapters are also added to both ends of the DNA, allowing it DNA to bind to flow cells. PCR amplification is then performed, as is purification.

Library Prep Kits
(i.e. Agilent Genomics)

Automation Plates and Tips
(i.e. labForce)

6 - DNA Sequencing

Prepared DNA libraries are then placed into the Illumina sequencer (NextSeq, MiSeq, Ion Torrent, etc.). Nucleotides bind to the template strand in a process called sequencing by synthesis.

7 - Results & Analysis

Finally, large amounts of data are generated by comparing the new sequence to a reference genome. Contact your local Thomas rep for more on Results & Analysis solutions!

NGS utilizes parallelized platforms to achieve ultra-high throughput (up to 43 billion short reads per instrument run), allowing labs to tackle increasingly complex research with great efficiency.

The commonly utilized Illumina workflow is displayed to the left. Click product images to view on ThomasSci.com.

CLICK HERE for a free NGS workflow consultation from a Thomas Clinical Diagnostics expert!

Key NGS Manufacturers Offered

Sample Collection

COPAN

Nest Scientific USA Inc.

CORNING

SUPERA FULFILLMENT

DNA Extraction

Agilent

MP

ZYMO RESEARCH

MicroGEM

Shearing

Millipore Sigma

IBI SCIENTIFIC

ADVANTECH
A wstyler® Company

Size Selection

bioline™
meridian BIOSCIENCE

Benchmark Scientific

omega BIO-TEK

Library Prep

labForce®
powered by Thomas Scientific

VICTORY SCIENTIFIC

Agilent

ZYMO RESEARCH

Click manufacturer logos to view full product listings on ThomasSci.com

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