UND UNIVERSITY OF NORTH DAKOTA

Equipment available for Core use

GridION X5 Nanopore: The Nanopore is a compact benchtop system designed to run and analyze 5 flow cells simultaneously. It can sequence DNA and RNA directly, which enables direct identification of modified bases, like methylation, during sequencing. This instrument can run up to 480 samples for whole genome sequencing at one time with the native barcoding kit. Other kits include 16S sequencing, PCR cDNA sequencing and ultra-long read lengths of 50 kb.

Illumina MiSeq: The MiSeq Desktop Sequencer allows for focused applications such as targeted gene sequencing, metagenomics, small genome sequencing, targeted gene expression, amplicon sequencing, and HLA typing. MiSeq sequencing kits enable up to 15 Gb of output with 25 M sequencing reads and 2x300 bp read lengths.

Agilent Bravo Automated Liquid Handling Platform: The Bravo automated platform is a liquid handling system that automates sample preparation up to 96 samples at one time.

digital droplet PCR QX 200: ddPCR provides absolute quantification of target DNA or RNA molecules for EvaGreen or probe-based digital PCR applications. Droplet Digital PCR is a method for performing digital PCR that is based on water-oil emulsion droplet technology. A sample is fractionated into 20K droplets, and PCR amplification of the template molecules occurs in each individual droplet. This massive sample partitioning is what allows for absolute quantification and detection of very low abundance targets.

-QX 200 droplet generator
-QX 200 droplet reader

Agilent 4200 Tapestation: The Agilent TapeStation is automated electrophoresis in the solution system for quality assessment of DNA and RNA through analysis of fragment size distribution. It can analyze the size, quantity, and integrity of the samples. It uses 1-2 ul of the samples and takes about 1-2 minutes per sample to analyze. The system has 16 lanes where each sample is analyzed individually, which eliminates contamination and carryover. Anywhere from 1 to 96 samples can be analyzed at a time.

D1000 (use for normal libraries)

- Size range 35-1000 bp
- Sensitivity 0.1 ng/ul
- Analysis time 16 samples: <20 min, 96 samples ~100 min

Genomic DNA (ATAC-seq or DNA)

- 200 bp-60000 bp
- Sensitivity 0.5 ng/ul
- Analysis time 16 samples <25 min, 96 samples <150 min

BioTek FLx800 fluorescence microplate reader using Quant-iT Picogreen kit: Quant-iT Picogreen kit is an ultrasensitive fluorescence nucleic acid stain that is used for calculating the quantity of dsDNA in a solution. This kit is read by the BioTek Gen 5 microplate reader and is used after the bioanalyzer to get a better concentration of User-Prepared libraries prior to Digital Droplet PRC. Samples of the same project are normalized and then the pooled sample will be run on droplet.

Invitrogen Qubit 4 Fluorometer: The Qubit 4 quantitates DNA and RNA with unprecedented accuracy, sensitivity, and simplicity. It is designed for molecular biology labs that work with precious samples that are rare or difficult to process, and applications requiring precise measurement such as real-time PCR and sequencing applications.

Thermo Scientific NanoDrop One: NanoDrop One is a UV-visible spectrophotometer which quantifies and qualifies RNA or DNA samples using 1-2ul of sample.

Agilent 2100 Bioanalyzer: The Agilent Bioanalyzer system provides sizing, quantitation and quality control of DNA and RNA. Agilent's chip technology allows for electrophoretic analysis of nucleic acids using very low (1-4uL) sample volumes.

LUNA II Automated Cell Counter: The LUNA II is an automated cell counter capable of autofocusing and providing accurate cell counts and viability analysis.

Sage Science Blue Pippin: Blue Pippin is an automated gel electrophoresis system capable of isolating targeted DNA fragment sizes from 100 bp to 50 kb.

10x Chromium Single Cell Controller: 10X Chromium system (10X genomics) is a small tabletop instrument which is can efficiently combine large cell numbers with a massively diverse barcode library to generate >100,000 barcode-containing cells in a matter of minutes. These barcoded cells are compatible with Chromium Solution, from genome to single cell analysis and useful for single-cell expression profiling, ATAC-Seq, exome sequencing, CNV detection single cell, de novo genome assembly.

Promega Maxwell RSC Automated Extractor: The Maxwell RSC is a compact, automated instrument that can process up to 16 samples simultaneously for nucleic acid purification. It offers consistent and reliable RNA or DNA extraction.

Agilent AriaMx Real-Time PCR System: The Aria is a fully integrated qPCR system for amplification, detection, and data analysis that also has a termal cycler and data analysis software

BioRad T100 Thermal Cycler: The T100 Thermal Cycler **i**s a small thermal cycler offering a comprehensive set of convenient features in a small footprint.