

GENOMICS & BIOINFORMTICS CORE FACILITY STATEMENT

The facilities at University of Notre Dame will support the successful completion of this project in several ways. The Notre Dame Genomics and Bioinformatics Core Facility (GBCF) is a 1500 square foot facility that houses specialized equipment for DNA and RNA sequencing along with 10X single cell and Visium spatial transcriptomics applications. Equipment includes Illumina MiSeq and NextSeq 500 sequencers, 10X Chromium Controller, Countess II FL, Applied Biosystems 3730xl 96-capillary sequencer, Agilent 2100 Bioanalyzer, Qubit 2.0 Fluorometer, BioRad CFX384 Real-Time PCR Detection System and Sage Science BluePippin, and Covaris S220 high-intensity acoustic shearing equipment. The GBCF operates a BSL2 space in the facility for single cell work. Cost effective sequencing for large-scale sequencing projects is achieved by outsourcing through negotiated contracts. A managing director, research technician, and two technical specialists are employed full-time in the genomics lab and are responsible for operating and maintaining the equipment listed above and have received training from respective manufacturers in machine maintenance and experimental methods. The GBCF provides comprehensive support for library preparation for either off-the-shelf or custom workflows and provides bioinformatics support using well-developed pipelines for the analysis of genomic data through a full-time Senior Analyst. The GBCF assists users with all phases of a project from experimental design to data management and downstream analysis.

There are two primary classes of computing resources that the GBCF uses: 1) high memory machines (up to 1 TB, tens of cores) prioritized for bioinformatics research, and 2) the university's Center for Research Computing (CRC), a large shared computational resource with accompanying research data backup and archival storage. The CRC operates a state of the art High Performance Computing (HPC) facility providing advanced computing support to researchers within Notre Dame, the local community and industry. The facility is highly secure and reliable and can be accessed securely and seamlessly. The High Performance Computing (HPC) team manages parallel supercomputers, clusters, grid networks and storage (around 23,000 cores and 3000TB of storage) which provide exceptional levels of processing speed and power. The GBCF, aided by the CRC, is the perfect partner for any -omics focused project due to our expertise and these University wide resources.