GENOMICS & BIOINFORMATICS CORE FACILITY

(Updated 11/2026)

The University of Notre Dame's Genomics and Bioinformatics Core Facility (GBCF) is a 2,100 square-foot, BSL2-approved center providing comprehensive genomic services and advanced computational support, ensuring the successful and cost-effective completion of high-throughput research projects.

Genomics Capabilities & Expertise

The GBCF delivers end-to-end support, from initial consultation to data acquisition, leveraging cutting-edge equipment and specialized personnel.

- **Sequencing & Transcriptomics:** The facility is fully equipped for next-generation sequencing, including specialized systems for advanced single-cell and spatial analysis:
    - **Illumina Sequencing:** MiSeq and NextSeq2000.
    - **Single-Cell & Spatial Transcriptomics:** 10X Genomics Chromium iX, Visium CytAssist, and Xenium In-Situ Analyzer systems.
- **Quality Control:** Comprehensive DNA and RNA quality control is performed using a suite of instruments, including the 4200 Tapestation Systems, Qubit 4.0 Fluorometer, SpectraMax iD3s, and BioRad CFX Opus Real-Time PCR. (A full list of supporting equipment is available upon request.)
- **Personnel & Workflow:** A team of four full-time professionals (Managing Director, two Technical Specialists, and a Research Technician) are dedicated to the genomics laboratory. They provide comprehensive consultation and support for both off-the-shelf and custom library preparation and genomics workflows, with manufacturer-certified training in equipment operation and maintenance.
- **Cost Efficiency:** Cost-effective sequencing for high-throughput projects is achieved through negotiated outsourcing contracts.

Advanced Bioinformatics & Computational Resources

The GBCF's Bioinformatics team ensures robust and scalable analysis of complex genomic data, tightly integrated with the university’s High-Performance Computing infrastructure.

- **Bioinformatics Team & Support:** The team includes two faculty Bioinformaticians who provide on-demand consulting, full-scale analysis of genomic data, software and database support, and the development and distribution of documented, reproducible workflows.
- **Training:** A range of training options, including courses and workshops, are offered to assist lab personnel in developing their data analysis expertise.

- **Center for Research Computing (CRC) Integration:** Research computing is anchored by the CRC's state-of-the-art High-Performance Computing (HPC) facility:
    - **HPC Power:** The CRC manages parallel supercomputers and clusters, providing exceptional processing speed and power with approximately 23,000 cores and 3,000 TB of secure, reliable storage.
    - **Dedicated GBCF Nodes:** The GBCF has partnered with the CRC to deploy dedicated high-memory nodes (up to 2TB) for demanding bioinformatic analyses. These nodes are attached to the main data storage, enabling seamless use of either CRC or GBCF hardware without data transfer delays.
- **External Access:** The GBCF maintains a community allocation through the NSF ACCESS program, providing researchers with access to powerful national resources, including the PSC Bridges2 cluster (up to 12TB memory per node) and the Jetstream2 scientific cloud platform for hosting web-based tools like genome browsers and Shiny servers.