DNA SEQUENCING CORE

UNIVERSITY OF MICHIGAN MEDICAL SCHOOL

The DNA Sequencing Core at The University of Michigan provides high-quality, low-cost DNA analysis for researchers on a recharge basis. The Core operates several labs at the University of Michigan Ann Arbor campus, with 26 highly trained individuals on staff to help you. We operate a variety of instruments designed to help you assess the quality of your DNA and prepare it for analysis.

List of Services

- **Sequencing**
  - *Sanger Sequencing: The Core provides our clients with high-quality, extremely cost-effective DNA sequencing of PCR products, plasmids, siRNA constructs, DNA fragments, and large DNA templates including plasmids over 20 kb, cosmids, lambda clones, P1 clones, BACs, and bacterial genomic DNA.*
  - *PyroMark is a fully integrated system that provides real-time sequence information and is highly suitable for epigenetics research and genetic analysis.*
- **Next-Generation Sequencing**
  - *Illumina Sequencing: The Core offers Illumina high throughput sequencing on five HiSeq2000 instruments. The HiSeq2000 can generate up to 3 billion reads (or 6 billion pairs) per run. This translates to ~600Gbases of data. Illumina Sequencing offers genomic, RNA-seq, ChiP-Seq, exome sequencing, and multiplexing options. The Core also offers library preparation services including custom multiplexing.*
  - *Pacific Biosciences: The PacBio RS system generates average read lengths greater than 2000bp or high accuracy single molecule circular concensus reads for fragments up to 500bp. Real-time sequencing provides fast, flexible, and cost effective sequencing. Data generated from this platform is particularly useful in de-novo sequencing applications and targeted resequencing.*
  - *Ion Torrent PGM: Offers semiconductor based sequencing technology capable of delivering accurate, fast, and relatively long reads on a cost-effective scale. The main applications are targeted resequencing and small genome resequencing.*
  - *Roche 454FLX: Offers long read lengths well suited to de-novo sequencing, complex genomes or characterization of the immune repertoire.*
- **Genotyping**
  - *Illumina: The Core performs custom and standard Illumina® BeadArray™ Genotyping assays and can analyze up to 5 million loci million per human sample. Genomic variations due to SNPs, CNVs, & LOH can be identified with these. Genotyping assays are available for human, mouse, canine and many more species. The Core offers data analysis and has workstations available with Illumina GenomeStudio™ Genotyping Data Analysis Software.*
  - *Affymetrix: offers the 1 million feature Human SNP 6.0 for genotyping and copy number assessment. The Core offers a full service (DNA to Analysis) option for PI's. More details can be found at www.michiganmicroarray.com.*
  - *Sequenom: This platform offers a cost-effective method to assay as many as 40 SNP targets per reaction, utilizing MALDI-TOF mass spectrometry. It also provides a highly scalable means of investigating a few or several hundred methylation regions over multiple samples.*
- **Gene Expression**
  - *Affymetrix: The Core offers the full line of Affymetrix GeneChips for gene expression analysis. Whether you need human, mouse or a long list of other organisms, users can choose a wide variety of GeneChips. The Core processes user submitted total RNA and includes data analysis.*
  - *Illumina: The Core offers Illumina® Direct Hybridization Gene Expression profiling for Human & Mouse RNA samples. An Illumina® DASL™ Assay is available for elucidating RNA gene expression profiles for Formalin-Fixed, Paraffin-Embedded (FFPE) human samples. For clients use, the Core has workstations available with GenomeStudio™ Genotyping Data Analysis Software.*
  - *Targeted Gene Expression qPCR Arrays*

DNA Sequencing Core
Biomedical Research Core Facilities
North Campus Research Complex
Building 14 • Room 122 • 2800 Plymouth Road
Ann Arbor, MI 48109-2800

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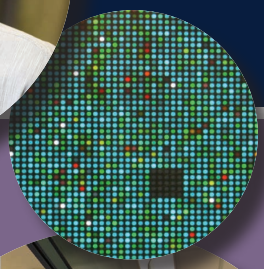
> **The DNA Sequencing Core is growing and changing to adapt to the latest technologies and trends on a daily basis. We are a full-service Core, and we work closely with our investigators to meet their needs and make their research as successful as possible.**
>
> *– Robert Lyons, Ph.D., Director, DNA Sequencing Core*



- IRT-profiler Arrays target 84 genes within a particular pathway or gene-set using qPCR, offering hundreds of different pathways to choose from.
- OpenArray pathway panels target ~700 genes within broader pathways using qPCR. These panels are an excellent, low cost screening and confirmation tool for validating gene expression data.

- **Epigenetics**
  - *Illumina HumanMethylation Products*
    - The Core performs methylation profiling using the HumanMethylation27 (27k loci) and HumanMethylation450 (450k loci) products. FFPE samples can be evaluated and restored and methylation profiles generated using the HumanMethylation450 BeadChip.
    - The Core performs Illumina® Methylation Profiling for FFPE samples can be elucidated using an Illumina® InfiniumHD FFPE QC kit, an InfiniumHD FFPE Restore Kit, & the HumanMethylation450 BeadChip kit.
  - *Sequenom EpiTYPER*
    - EpiTYPER on the Sequenom platform is designed to provide accurate & reproducible methylation mapping. This includes individual methylation ratios for a given CpG & relative methylation ratios between 10%-90%.

- **Other Core Services**
  - *Agilent Bioanalyzer*
  - *NanoDrop Measurement*
  - *QuBit Assays*
  - *Real-Time PCR on the ABI 7900 and ABI Step One Plus systems*
  - *DNA Fragmentation using Covaris Adaptive Focused Acoustics technology*
  - *Genomic DNA isolation from blood using the Qiagen Autopure LS*
  - *Rent software packages from the Sample Drop-Off Site at MSRBII, such as Sequencher and Mutation Surveyor*

The DNA Sequencing Core is growing and changing virtually on a daily basis, so if you don't see an analysis listed here contact us to inquire. Several new systems have recently arrived, or are arriving soon!

Cost Estimates and Fees

Costs vary widely depending on services used and analysis. Please contact a member of the staff or visit the website for details: medicine.umich.edu/dnaseq.

Connect with Us

The DNA Sequencing Core offers five locations around the University of Michigan in Ann Arbor, Michigan. Our main laboratory at the North Campus Research Complex offers more than 10,000 square feet of space:

North Campus Research Complex
Building 14 • Room 122
2800 Plymouth Road
Ann Arbor, MI 48109-2800
Phone: 734-764-8531
Email: boblyons@umich.edu
Open Mon-Fri • 8:30 a.m.-12:15 p.m. and 1:15 p.m.-4:30 p.m.

Medical Science Research Building II
Room 2568 • 1150 W. Medical Center Drive
Ann Arbor, MI 48109-0674
Open Mon-Fri 8:30 a.m.–12:15 p.m. and 1:15 p.m.–4:30 p.m

Life Sciences Institute
Room 3266 • 210 Washtenaw Ave.
Ann Arbor MI 48109
Open Mon-Fri • 1:30 p.m.–3:30 p.m.

Krause Natural Science Building
Room 1116 • 830 North University Ave.
Ann Arbor MI 48109-1048
Open Mon-Fri • 10:00 a.m.-12:00 p.m.

Brehm Tower
Room 8054 • 1000 Wall Street
Ann Arbor MI 48105
Open Mon-Fri • 4:00 p.m.-5:00 p.m.

About the BRCF

The BRCF, part of the University of Michigan Medical School Office of Research, is a collection of centralized labs and services offering state-of-the-art instruments, resources and expertise to biomedical researchers, investigators and educators.

For more information on the BRCF, visit **medicine.umich.edu/brcf**

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University of Michigan Medical School
2570 MSRB II • 1150 W. Medical Center Drive
Ann Arbor, MI 48109-0674
734-647-4776
brcf-umms@umich.edu

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