

DHM | RI

Capabilities & Services

Accelerating Research & Development

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INTRODUCTION TO DHMRI

The David H. Murdock Research Institute (DHMRI) is a nonprofit life sciences research institute that provides collaborators groundbreaking research and development solutions at the intersection of human health, agriculture and nutrition. Located at the heart of the North Carolina Research Campus (NCRC), DHMRI contains instrumentation, resident expertise, and well-equipped laboratories that bring together a variety of disciplines under one roof. DHMRI has developed a multidisciplinary, integrated approach that incorporates a variety of scientific platforms. By combining collaboration and customized solutions, DHMRI finds answers to advance research and product development.

MULTIDISCIPLINARY APPROACH

No one science or platform can provide the comprehensive analysis needed for confident decision making. That is why DHMRI has adopted and incorporated a multidisciplinary, integrated approach that includes:

- **Genomics**
- **Metabolomics**
 - **NMR based Metabolomics**
- **Animal Facility**
- **Interactive Data Analysis Platform**
- **Laboratory and Office Space Rentals**

DHMRI offers the following services that enable a complete research and development experience.



GENOMICS

DHMRI's Genomics Laboratory provides next generation sequencing services, including whole organism de novo sequencing, targeted regional resequencing, DNA methylation profiling by sequencing, and whole transcriptome sequencing. The Genomics Laboratory features multiple platforms for genomic analysis.

All services are supported by state-of-the art computational and bioinformatics resources.

Applications include:

- Next generation sequencing
 - Whole genome sequencing
 - Transcriptome analysis
 - Gene regulation studies
 - Amplicon sequencing
- Microarray abilities
- Sequenom MassARRAY applications

Services

-DNA sequencing

- Next-generation sequencing
- Whole genome sequencing
- SNP detection
- ChIP-Sequence
- Transcriptome sequencing
- Whole genome methylation analysis

-Expression analysis

- Targeted candidate gene expression
- Whole genome expression analysis

-Genotyping

- Genome-wide association
- Mid-plex linkage peak/candidate gene analysis
- Single-plex candidate gene analysis

-Small RNA analysis

METABOLOMICS

The DHMRI Metabolomics Laboratory provides methods for targeted and broad spectrum analysis using mass spectrometry (MS) and nuclear magnetic resonance (NMR) technologies. Through the linking of metabolites to known biochemical pathways, investigators can develop mechanistic insights that show promise in staging disease, monitoring therapeutic treatments, and developing or improving intervention strategies.

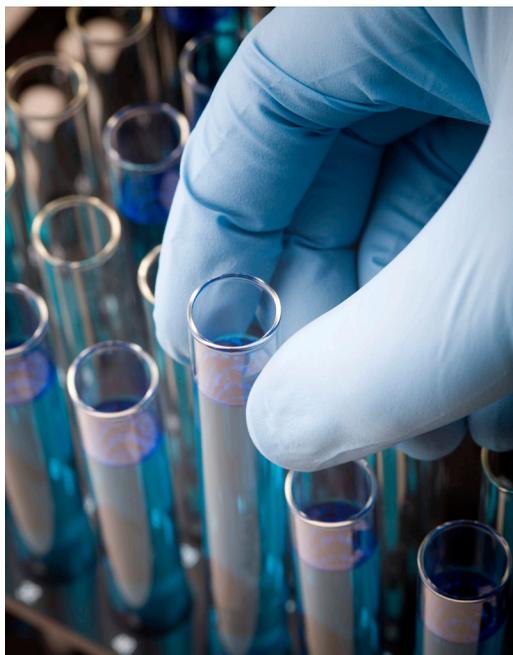
Uniquely positioned to provide high throughput metabolite analysis from a single compound to broad metabolite profiling, the Metabolomics Laboratory has the technology and expertise to provide insight into complex biological processes.

Applications include:

- Custom assay development for small molecule and metabolite quantitation
- Metabolite biomarker studies that lead to early predictive or diagnostic markers for:
 - Disease, disease staging, therapeutic monitoring, determining susceptibility
- Unknown compound identification and/or structural elucidation

Services

- Metabolomics profiling utilizing LC/MS, GC/MS, ICP/MS, and NMR based profiling for high throughput chemical marker discovery
- Qualitative and quantitative metabolite analysis
- Data analysis and interpretation:
 - Assay development for targeted metabolite detection and quantitation
- Structural elucidation using NMR, exact mass, and MSⁿ
- Structure determination of other biological/chemical compounds



BIOINFORMATICS

DHMRI has a dedicated bioinformatics team that employs a broad range of analytical tools to analyze the large data sets that are generated in the laboratories. DHMRI Bioinformatics facilitates a collaborative environment using technology and business disciplines for acquiring, managing, integrating, optimizing, analyzing, inferring and referencing disparate data for our Genomic and Metabolomic laboratories.

At the union of science and technology, the bioinformatics group touches every area of scientific research within the DHMRI.

Applications include:

- Centralized data management
- Comparison of novel DNA and protein sequence data to well-characterized data
- Intensive data computations within the cluster environment

Services

-Genomics

- Advanced Sequencing QC Analysis
- Reference mapping/alignments
- Variant Calling (SNV/SNP)
- Structural Variation Detection (indels, inversions, CNV, etc.)
- De novo genomic assembly, finishing, and annotation
- Metagenomic assembly
- Transcriptomics
 - Novel splicing sites, exon, and transcript discovery
 - RNASeq and Differential Expression Analysis (microarray data as well)
 - Small RNA analysis
 - De novo assembly
 - RNA secondary structure prediction
- Pathway analysis
- Targeted Resequencing Analysis
- Bis-DNA and methylated DNA sequencing analysis
- ChIP-Seq analysis
- Phylogenetics

- BLAST/database querying and analysis
- Genome Wide Association Studies (GWAS)

-Proteomics

- Expression profiling
- Pathway analysis
- BLAST/database querying and analysis
- Pattern discovery
- Motif discovery
- Signal peptide discovery
- Secondary structural determination and prediction
- Clustering

-Metabolomics

- Pathway analysis
- Data annotation
- Multivariate analysis

CONTACT DHMRI

For Business Opportunities, please contact:

THE DAVID H. MURDOCK RESEARCH INSTITUTE

150 Research Campus Drive

Kannapolis, North Carolina

28081 USA

+1.704.250.2600

www.dhmri.org

