DHM | RI Integrated Services Guide

From concept to data: R&D programs tailored to your needs

DHMRI provides rapid, cost-effective, customized genomics, metabolomics, NMR and vivarium solutions to support your research, product development, characterization and quality needs. Combining decades of expertise with cutting-edge instrumentation, DHMRI offers customized contract research programs in:

Investigating genomic and metabolomic changes, and their relationship with health.

Assessing the impact of foods, supplements, and other nutritional products.

Characterizing the impact of genetic and phenotypic changes on crops and livestock.

Our unmatched facility on the North Carolina Research Campus in Metro-Charlotte, NC, is staffed by a highly experienced team of scientists with broad expertise across multiple areas. So, whether your project is large or small, we provide multi-disciplinary, multi-platform solutions that drive projects from concept and study design, through to data analysis and interpretation.

Our commitment to you includes:

- Expert consultancy on study design
- Explaining timelines, and level of investment
- Providing regular, proactive updates on project status
- On-time delivery of quality data

DHM | RI

150 Research Campus Drive,
Kannapolis, NC 28081

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Genomics Services

DHMRI's highly qualified scientists have expertise across multiple technologies which enables us to support a broad range of applications for biotech, pharma, agbiotech, food and lifestyle companies, as well as academic groups.

Our services are designed to meet your specific scientific goals, and we use novel and customized methods, assays, and protocols to deliver quality data. Recent projects included:

- Sequencing to characterize microbial function in different matrices (food products, soil, human and animal digestive systems)
- Population studies for epigenetic characterization
- Designing and performing exome sequencing to identify cancer biomarkers
- Target sequencing to support plant breeding programs
- Transcriptomics using both sequencing (shotgun and Iso-Seq), and more quantitative fluorescence probe hybridization approaches (NanoString).

DHMRI's genomics lab is equipped with multiple technologies including **Illumina, Pacific Biosciences, 10x Genomics, and NanoString**, which enable us to run a broad range of projects quickly and efficiently. In addition, we can generate samples either through cell culture or our vivarium, offering full extraction capability for multiple sample types.

Applications offered include:

Genomics

- Whole Genome Re-Sequencing
- De novo Sequencing
- Low-pass Whole Genome Sequencing
- Target Region Sequencing
- Exome Sequencing
- Genetic Analysis

Transcriptomics

- RNA-sequencing
- 3' RNA-sequencing
- Full-length mRNA sequencing (Iso-Seq)
- Small RNA sequencing
- Target RNA profiling
- Single cell RNA-Sequencing

Epigenetics

- Whole-genome bisulfite sequencing
- Target Region bisulfite sequencing (Capture Methyl-seq)
- Infinium Methylation Epic Arrays
- miRNA profiling
- Single cell chromatin profiling (ATAC-seq)

Microbiome

- 16S/ITS profiling
- Metagenomics sequencing

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Metabolomics Services

DHMRI's metabolomics facility features a highly experienced team and a state-of-the art laboratory equipped with multiple platforms for mass spectrometry (MS) and nuclear magnetic resonance (NMR) analysis. With a deep understanding of chemistry, structures, and metabolic pathways, we are ready to support your research as part of a multi-omics approach to investigating a diversity of metabolic pathways and processes across a broad range of applications.

When working with our team, you can expect a meticulous approach to study design, data acquisition and analysis, and standardized methods for working with a range of sample matrices, including human and animal biospecimens, tissue matrices, plant samples, cell culture, food, and environmental samples.

Our experience uniquely equips us to provide second-to-none support for the development of customized targeted or quantitative panels to meet the needs of your specific research questions. We can generate a metabolic fingerprint through global profiling, or address key biological processes with our targeted metabolomics panels.

Our metabolomic panels include:

Global Profiling

- Mammalian Discovery Panel

Mammalian Targeted Metabolomic Panels

- Biocrates AbsoluteIDQ p180 Kit
- TCA Cycle
- Short Chain Fatty Acids
- Oxidative Stress and Inflammation
- HODE
- Cortisol

Plant Targeted Metabolomic Panels

- Volatiles and Aroma Compounds
- Steviol Glycosides
- Cannabinoids

Custom Assay / Panel Development

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NMR Services

DHMRI has one of the best equipped NMR facilities available, anywhere, with state-of-the-art labs including 600, 700 and ultra high-field 950 MHz NMR spectrometer platforms. For sensitive, high-resolution, and low noise studies, we support multiple room temperature and cryogenic probe options: ^{1}H, ^{13}C, ^{19}F, ^{31}P, and ^{15}N, with sample automation for high-throughput applications.

We have a 1D and 2D experimental software suite for structural analysis of small molecules, peptides, and small nucleic acids, including HSQC, HMBC, DEPT, COSY, NOESY/ROESY, and carbon optimized probes for INADEQUATE or 1D carbon experiments. The DHMRI team can also conduct multidimensional 3D and 4D NMR experiments.

DHMRI works closely with pharma and biotech, supporting their small molecule and biotherapeutic research by providing critical data on structure, binding and purity.

Applications include:

- Structural elucidation or verification
- Fragment-based drug design / protein-ligand interactions and screening
- Macromolecular assignment and dynamics
- Impurity identification
- Absolute or relative purity determination
- Multiple field strengths for dynamic ^{13}C optimized experiments
- Metabolomics
- Application/method development
- Macromolecular data collection

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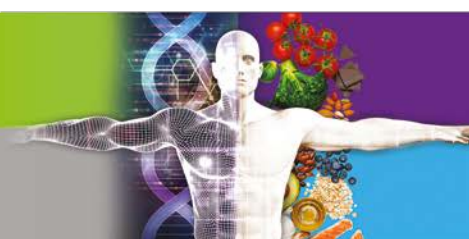

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Vivarium Services

DHMRI offers a full vivarium facility managed by experts dedicated to maintaining the welfare of all laboratory animals under our care. Our 25,000 sq. ft animal research facility is accredited by AAALAC International and managed by an American College of Laboratory Animal Medicine (ACLAM)-board certified attending veterinarian.

We provide seamless coordination for interventions, sample preparation, procedures, experiments and data analysis.

Our services include:

- Animal model design & management
- Housing and husbandry
- Colony management and expansion
- Genomics
- Metabolomics

Study Experience

- Compound metabolism and PK
- Nutrition & obesity
- Metabolic & energy expenditure
- Behavior & cognition
- Brown fat metabolism & temperature regulation
- Solid tumor
- Aging

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