

# Shared Biomedical Resource Facilities at UNC Chapel Hill

Expertise. Innovation. Collaboration.



UNC School of Medicine  
Office of Research Technologies

July 2024



Shared biomedical resource facilities, "Research Service Centers" or "core facilities" consolidate technical knowledge, staff expertise, and specialized instrumentation and equipment in an independent facility.

UNC's research enterprise is supported by a broad network of over 100 core facilities. While the majority of these facilities fall under the jurisdiction of the School of Medicine, others reside within the Schools of Public Health, Pharmacy, Dentistry, Nursing, and the College of Arts and Sciences.

"My lab uses UNC cores because they provide the expertise and cutting edge equipment we need for our research."

DR. RICHARD CHENEY  
PROFESSOR, DEPARTMENT OF CELL  
BIOLOGY AND PHYSIOLOGY

# About This Guide

UNC core facilities have been divided into the following categories. Some cores' services span multiple categories and may be cross-listed. Read on for more information about core facilities or click on a link to jump to a section of interest.

- I. [Animal Models and Husbandry](#)
- II. [Cell and Tissue Biology](#)
- III. [Clinical \(Laboratory and Drug Development\)](#)
- IV. [Clinical \(Human Behavior and Patient Data\)](#)
- V. [Biospecimen Collection and Processing](#)
- VI. [Immunoassays and Cytometry](#)
- VII. [Structural Biology and Analytical Chemistry](#)
- VIII. [Fabrication, Matter Characterization, and Engineering](#)
- IX. [Genetics, Genomics, and Vector Production](#)
- X. [Bioinformatics, Biostatistics, and Data Analysis](#)
- XI. [Light Microscopy and Electron Microscopy](#)
- XII. [Neuroimaging and Neurobiology](#)

The cores listed in this guide are those that are in the [ORT database available on our website](#), which also maintains a list of specific equipment housed in those cores. It is not exhaustive of all the cores at UNC and other cores may be added to the database and this guide.

# Support Units for Core Facilities

IF you have questions about core facilities, are interested in establishing a core facility, or would like support in identifying a core facility that may have what you need please reach out to either of the below offices for assistance.

**UNC School of Medicine Office of Research Technologies**  
**<https://www.med.unc.edu/corefacilities>**

**ORT Central Inbox: [corefacilities@med.unc.edu](mailto:corefacilities@med.unc.edu)**

Christopher Gregory, PhD

Director, Office of Research Technologies  
[christopher\\_gregory@med.unc.edu](mailto:christopher_gregory@med.unc.edu)

Kara Clissold

Associate Director, Office of Research Technologies  
[kara\\_clissold@med.unc.edu](mailto:kara_clissold@med.unc.edu)

**OVCR/OSP Research Core Development Team**  
**<https://osp.unc.edu/core-facilities/>**

**RCD Central Inbox: [RCD@unc.edu](mailto:RCD@unc.edu)**  
**iLab Support: [CoreSupport@med.unc.edu](mailto:CoreSupport@med.unc.edu)**

Meghan Kraft

Interim Director, Research Core Strategy  
[Kraftmeg@unc.edu](mailto:Kraftmeg@unc.edu)

Ben Wright

Director, Research Core Development  
[Bwright1@email.unc.edu](mailto:Bwright1@email.unc.edu)

# Why use a core facility?

"I know that every time I get to speak with a core director, it's going to be a learning experience."

NIKEA PITTMAN, PHD  
SPIRE POSTDOCTORAL FELLOW

Our cores are run by experts who can help you do your science, better. You pay usage-level fees to access high-quality technology, equipment, and expert personnel. This gives you the opportunity to be creative and flexible in bringing novel technologies into your field of research without committing to an expensive equipment purchase that will take up valuable lab space or create ongoing costs for service contracts and technician support.

# How do I get started?

1. Identify which cores may offer the services you need. If multiple cores offer similar services, request a consultation with both directors. Some cores may have specific, pertinent experience in your area of research, may offer subsidized rates, or may offer you a different level of access to the instrumentation.

2. Request a consultation with the core directors. Consultations serve an important step in the research process--take advantage of the core director's expertise in sample prep and experimental controls to set your experiment up for success

3. Core services are billed through either iLab or Infoporte. The core facilities can help you access the system you need to initiate a service/sample request.

# What do I need to know before using a core facility?

## Rigor and Reproducibility

Core facilities at UNC are held to NIH's standards on Rigor and Reproducibility.

They are committed to ensuring the research they support also conforms to these standards.

You will be most successful in getting the highest-quality data or product if you reach out early in your study design process to the potential core(s) you will use. They are experts in what they do and will help you develop a robust study design. Most cores do free initial consultations to set their customers up for success--we encourage you to reach out!



# Acknowledging the contributions of core facilities

Core staff are scientists, and deserve scientific recognition like any other member of your team--regardless of cost of service. If you use a core it is best practice to acknowledge the core in your papers.

Sometimes, core staff contribute significantly to the paper and should be considered for authorship. Reach out to the core you use for their guidance on how they would like to be acknowledged or if there might be authorship considerations.

Tracking the research supported by each core is an important metric to demonstrate a core's success. This can only be done effectively if they are acknowledged appropriately.

# Animal Models and Husbandry

## Animal Clinical Lab Service School of Medicine

<https://www.med.unc.edu/clinicalchemistry/>

The Animal Clinical Laboratory Services Core provides hematological and clinical chemistry testing as well as multiplexed biomarker immunoassays. The Core offers investigators the ability to perform animal bloodwork using the same technology employed in human clinics but on instruments specifically designed for animal specimens.

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## Genomics and Energy Metabolism: Phenotyping Core Gillings School of Global Public Health, Nutrition Obesity Research Center

<https://norc.unc.edu/research-core/metabolic-phenotyping/>

The Animal Metabolism Phenotyping Core provides contemporary phenotyping techniques for metabolism and energy balance in mouse models of nutrition and disease. Their services include calorimetry, MRI, metabolic phenotyping of live cells, and Seahorse XFe 96. Services are available both in Chapel Hill and the NRI in Kannapolis.

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## Animal Models Core School of Medicine, LCCC <https://www.med.unc.edu/amc>

We offer production, validation and use of CRISPR/Cas9 custom nucleases for production of mutant mice, rats or cell lines, transgenic or knockout mice or rats, and reproductive services

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# **Biomedical Research Imaging Center: Small Animal Imaging/Center for Animal MRI**

School of Medicine, BRIC

<https://www.med.unc.edu/bric/small-animal-imaging/>

<https://www.med.unc.edu/bric/camri/>

BRIC Small Animal Imaging provides imaging modalities including PET/CT, SPECT/CT, High Resolution CT, Bioluminescence/Fluorescence and Ultrasound. The Small Animal MRI core provides a wide variety of small animal MRI services to investigators within or outside UNC. Large animal imaging services may be available depending on the species. Please reach out to the Small Animal Imaging Core if you have large animal needs.

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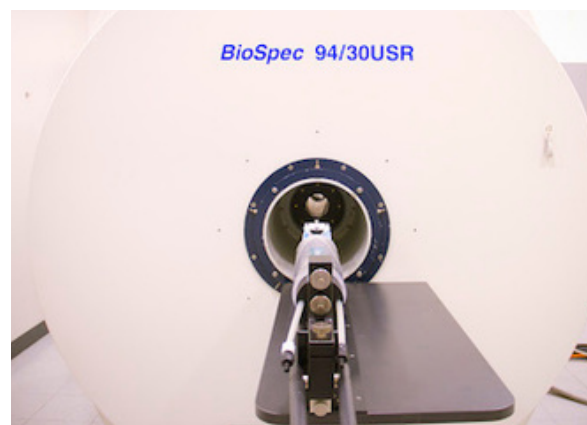
## **Cardiovascular Physiology & Phenotyping Core**

School of Medicine, McAllister Heart Institute

<https://www.med.unc.edu/mhi/adv surg models>

Services include: Surgical and non-surgical preclinical cardiovascular mouse models (e.g. aortic banding, myocardial infarct and hind limb ischemia models, femoral or carotid artery injury, arterial and venous transplant, vascular access, inferior vena cava banding, etc.), Cardiovascular Phenotyping (blood pressure measurement, small animal echocardiography, laser doppler measurements, ECG monitoring, etc.), Intravital Microscopy (Leukocyte rolling and adhesion, cell interactions, etc.), and tumor screening.

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Bruker 9.4T rodent mRI machine in the Small Animal Imaging Core

# Animal Models

## **CGIBD Gnotobiotic Core**

School of Medicine, Center for Gastrointestinal Biology & Disease

<https://www.med.unc.edu/ngrrc/>

The CGIBD Gnotobiotic Core provides germ free (GF) wild type (WT) and genetically-engineered gnotobiotic mice to CGIBD members and national DDRCC investigators, and provides technical support and expertise to facilitate optimal study design.

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## **Colony Management Core**

Office of the Vice Chancellor of Research

<https://research.unc.edu/cmc/>

Our service covers all aspects of managing given mouse or rat colonies. No colony is too small or simple; no colony is too large or complex. We are experienced with many genetic configurations and assist in establishing the most efficient, time- and cost-effective way to breed for specific research needs. We strive to improve weaning outcomes of harder to maintain mutant strains and reduce animal stress and overproduction.

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## **Mouse Behavioral Phenotyping Core**

School of Medicine, Carolina Institute for Developmental Disabilities

<http://www.cid.unc.edu/Research/mouseBehavioralPhenotyping.aspx>

The Mouse Behavioral Phenotyping Laboratory provides evaluation of mice across multiple domains of function, including motor and sensory ability and activity, sensorimotor gating, repetitive behavior and anxiety, social behavior, cognitive function, and perform neonatal assessments.

## **Mutant Mouse Resource and Research Center School of Medicine**

<https://www.med.unc.edu/mmrrc/>

The MMRRC acts as a repository for mutant strains of mice and distributes and cryopreserves scientifically valuable, genetically engineered mouse strains and mouse ES cell lines with potential value for the genetics and biomedical research community

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## **Preclinical Research Unit**

School of Medicine, LCCC

<https://www.med.unc.edu/pru/>

Services include: Small animal injection and surgical models, colony management, optical imaging, Traditional therapeutic and gene therapy approaches, Tumor transplantation and tumorigenicity testing, pharmacologic and pharmacodynamic assessment, experimental design and Protocol assistance. Production of nu/nu, SCID mice, GEMMS for studying melanoma and breast cancer, and syngeneic mouse models.

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## **Radiation Research Core**

School of Medicine, LCCC

<https://www.med.unc.edu/rrcf/>

Provides research support for radiation usage at UNC Chapel Hill and trains customers to use the five irradiators that are dedicated for research purposes. Irradiators can be used on cells, tissue specimens, rodents, and small mammals.

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# Animal Models

## **Systems Genetics Core (Collaborative Cross Mice)** School of Medicine, LCCC <https://csbio.unc.edu/CCstatus/index.py>

The UNC Systems Genetics Core was established to provide Collaborative Cross mice and genotypes to investigators both at UNC Chapel Hill and at other institutions.

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## **Zebrafish Aquaculture Core** Division of Comparative Medicine <https://zebrafish.web.unc.edu/>

The UNC Zebrafish Aquaculture Core Facility provides zebrafish husbandry and training services to researchers. The facility operates within and has veterinary care provided by the Division of Comparative Medicine (DCM). Zebrafish (*Danio rerio*) are a model organism for genetic analysis of vertebrate development, drug screens, cancer research, behavioral studies, environmental research, and toxicity testing. The following services are available: Zebrafish embryos (several wild-type and transgenic lines available), facilities and training for zebrafish microinjection and light stereomicroscopy, and project planning assistance

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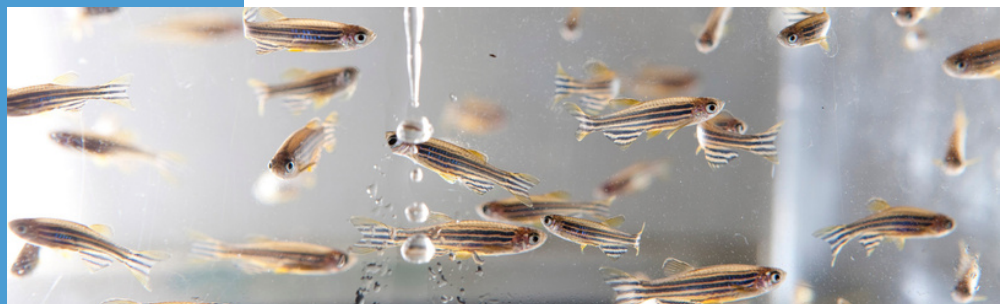


Photo courtesy of UNC School of Medicine and UNC Health

# Cell and Tissue Biology

## **Cellular Metabolism & Transport Core**

Eshelman School of Pharmacy

<https://pharmacy.unc.edu/the-unc-cellular-metabolism-and-transport-core/>

See entry under Clinical (Laboratory/Drug Development)

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## **CGIBD Histology Core**

School of Medicine, Center for Gastrointestinal Biology & Disease

<https://www.med.unc.edu/cgibd/cores/histology>

The core provides a full range of histology services, encompassing routine and specialized grossing, tissue processing, paraffin embedding, microtomy, H&E and special staining.. Consultations are also available and collaboration with other cores provides immunohistochemistry and slide scanning. These services are available to CGIBD members and non-members..

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# Cell and Tissue Biology

## Histology Research Core Facility School of Medicine

<https://histologyresearchcorefacility.web.unc.edu/>

The HRC provides paraffin and frozen embedding and sectioning, routine and special staining, immunohistochemistry and immunofluorescence, and RNAScope *in situ* hybridization. We have experience with many different tissue types from cell culture to organoids to human, animal and plant tissues.

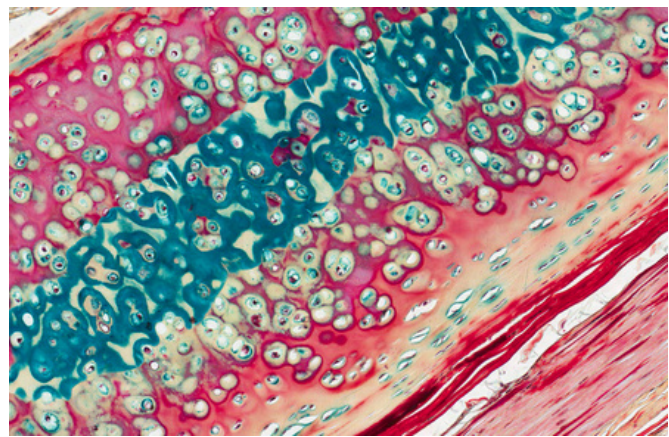
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## Human Pluripotent Stem Cell Core Facility School of Medicine

<https://www.med.unc.edu/humancellcore/>

The core offer expertise in generating induced pluripotent cells for disease modeling and prospective therapies, as well as differentiating them into specialized cellular lineages. We also provide full genome editing services using TALENs and CRISPR technology, along with gene regulation. Our expertise is available to develop joint proposals, provide technical support and consultation for researchers seeking to work with human pluripotent cells.

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"Our research program would not even be possible without the very specialized expertise and dedicated services provided from these cores."

LI QIAN, PHD

ASSOCIATE PROFESSOR, DEPARTMENT OF PATHOLOGY  
AND LABORATORY MEDICINE  
ASSOCIATE DIRECTOR OF THE MCALLISTER HEART  
INSTITUTE

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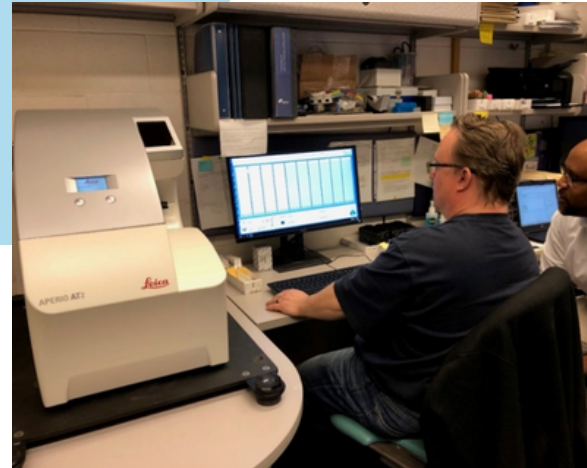
**MLI Tissue Procurement and Cell Culture Core**  
School of Medicine, Marsico Lung Institute  
<https://www.med.unc.edu/mlicellcore/>

The MLI TPC serves as a central source of de-identified normal, CF and disease control cells, tissues and fluids for a wide array of uses. We currently offer seven different cell types and three different types of growth media, which are all available for purchase.

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# Cell and Tissue Biology

Digital slide scanning available at the Pathology Services Core.



## **Pathology Services Core School of Medicine, LCCC**

<https://unclineberger.org/pathologyservices/>

The PSC offers histology (processing, embedding, sectioning), tissue microarrays, immunohistochemistry, special stains and in situ hybridization (RNAScope), slide scanning and image analysis, and digital spatial profiling (protein, RNA). Technologies available include Phenocycler, GeoMx, and Visium. The PSC has access to UNCH's tissue archive, facilitates pre-clinical and clinical studies, and offers study design support to investigators. In 2024, the PSC also acquired the Halo AI image analysis software for digital pathology.

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## **Tissue Culture Facility School of Medicine, LCCC**

<https://unclineberger.org/tissueculture>

The Tissue Culture Facility (TCF) is a full-service cell culture shared resource and provides Cancer Center members and UNC colleagues with a wide variety of services and products at substantial discounts. Services and products include: - Media, Reagents, and Supplies, Cell Culture Services, Special Cell Culture Services, Consultation, Training, and Technical Assistance, Centralized Cell Repository, and Screening and Testing.

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## **Tissue Procurement Facility** **School of Medicine, LCCC**

<https://unclineberger.org/tissue-procurement>

Collaborates with UNC Hospitals and Rex Health Care for procurement, processing, storage, and distribution of normal and malignant human specimens. Included in these services is the processing of blood for serum, plasma, packed red blood cells, and buffy coats. Additional biospecimens collected and stored by the facility include fat biopsies, toenails, urine, and other body fluids as defined by the research study.

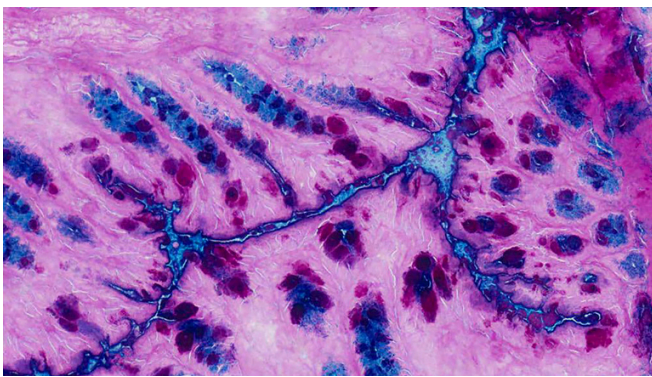
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## **Microbiome Core** **School of Medicine**

<https://www.med.unc.edu/microbiome/>

Services offered include metagenomics methods to determine the composition and function of microbial communities using amplicon, Whole Genome Shotgun and RNA sequencing, and traditional digital, and high-throughput quantitative (q)PCR. Consultation and research support services include sample genomic DNA isolation, plasmid and virus nucleic acids isolation, RNA isolation, strain typing, optimization of bacterial culture conditions, and high-throughput liquid handling (PCR reaction set up, sample pooling, picogreen quantification of nucleic acids). We also house the AMC Culture Collection to provide well-characterized, active and viable strains for microbiome studies that demand specific bacterial groups and/or functionality.

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PAS-Alcian Blue stain of formalin vapor-fixed intestine tissue. Staining done via the Histology Research Core Facility for the Microbiome Core.

# Clinical (Laboratory and Drug Development)

**Advanced Translational Pharmacology & Analytical Chemistry Lab**

Eshelman School of Pharmacy, LCCC

<https://pharmacy.unc.edu/research/faculty-labs/atpac/>

See entry under Biochemistry

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**Biobehavioral Laboratory**

School of Nursing

<https://bbl.unc.edu/>

See entry under Clinical (Behavioral/Patient)

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**Biospecimen Processing Facility**

Gillings School of Global Public Health

<https://bsp.web.unc.edu/>

See entry under Cell and Tissue Biology

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## **Cellular Metabolism & Transport Core**

Eshelman School of Pharmacy

<https://pharmacy.unc.edu/the-unc-cellular-metabolism-and-transport-core/>

The core develops new experimental methodologies, based on organ perfusion technologies, that can be applied to experimentation typically required for drug development and evaluation. The scope of the Core is to perform experimentation in a variety of isolated or in situ organs and tissues

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## **CFAR Clinical Pharmacology and Analytical Chemistry**

School of Medicine, Center for AIDS Research, LCCC

<http://unccfar.org/portfolio/pharmacology-analytical-chemistry/>

Services include: Pharmacokinetic-pharmacodynamic analysis; development and validation of small molecule methods using LC/UV, LC/MS and LC/MS/MS in a wide variety of animal and human matrices; grants and clinical trials consultation and research support.

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## **CFAR HIV/STD Laboratory Core**

School of Medicine, Center for AIDS Research, LCCC

<http://unccfar.org/portfolio/hiv-std-laboratory-core/>

The HIV/STD Core provides a CAP/CLIA accredited environment for HIV viral load testing, HIV diagnosis, CD4 counts, and diagnosis of Neisseria gonorrhoeae, Chlamydia trachomatis, Trichomonas vaginalis, and Mycoplasma genitalium. This core can also provide flow cytometry services on clinical samples. In addition, the HIV/STD Core provides specimen processing for clinical trials taking place at UNC.

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# Clinical (Laboratory)

**CRISPR Screening Facility**  
Eshelman School of Pharmacy  
<https://ddi.unc.edu/crispr/>

The CRISPR core provides screen design, benchmark, and objective consultations, Arrayed Screens with high quality CRISPR sgRNA arrays, automated assay with in-house robotics, individual acquisition and analysis for each target gene, and deliverable: high quality data sets for individual genes, and Pooled Screens which includes: high quality whole mammalian genome CRISPR sgRNA validated pools, assays, isolation of 'hit' genes, next generation sequencing and bioinformatics, and provides as a deliverable: rank list of genes identified in screen

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**Respiratory TRACTS Core**  
School of Medicine, Marsico Lung Institute  
<https://www.med.unc.edu/marsicolunginstitute/respiratory-tracts/>

The core provides turnkey support and services to clinical and biomedical studies including consultation, sample collection and processing, Multiplex, ELISA, RT-PCR, nanoString, microplate reads, and can provide support for BSL-3 samples.

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**Nanomedicines Characterization Core (NCore)**  
School of Medicine, Eshelman School of Pharmacy  
<https://ncore.web.unc.edu/>

[See entry under Biochemistry](#)

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**MLI Tissue Procurement and Cell Culture Core**  
School of Medicine, Marsico Lung Institute  
<https://www.med.unc.edu/mlicellcore/>

See entry under Cell and Tissue Biology

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**Genomics and Energy Metabolism: Nutrigenomics Core**  
Gillings School of Global Public Health, NORC  
<https://norc.unc.edu/research-core/nutrigenomics/>

The GEM: Nutrigenomics core provides expertise and services in two areas: 1) Nutrigenomics and 2) Microbiome Analysis. The Core offers laboratory services as well as customized, cutting-edge research tools, including 1) whole genome, exome, and targeted gene sequencing; 2) RNA-sequencing; 3) microbiota characterization, including 16S rRNA gene sequencing and shotgun metagenomics; 4) targeted genotyping using PCR-based assays; 5) array-based gene expression profiling; 6) and bisulfide sequencing for methylation patterns in humans and mouse models.

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"The professionalism, technical expertise, rapid turn-around and the rigor and reproducibility of all assays run in [UNC core] has enabled us to undertake experiments and projects that we never could have otherwise performed

KSHITIJ PARAG-SHARMA  
PHD CANDIDATE, AMELIO LAB  
DEPARTMENT OF CELL BIOLOGY AND PHYSIOLOGY



# Clinical (Laboratory)

AnaPrep 12 machine for DNA extraction housed within the Precision Nutrition Core



**Pathology Services Core**  
School of Medicine, LCCC  
<https://unclineberger.org/pathologyservices/>

See entry under Cell and Tissue Biology

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**Tissue Procurement Facility**  
School of Medicine, LCCC  
<https://unclineberger.org/tissue-procurement>

See entry under Cell and Tissue Biology

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# Clinical (Human Behavior and Patient Data)

## **Biobehavioral Laboratory**

School of Nursing

<https://bbl.unc.edu/>

The BBL specializes in non-invasive physiological measurement and instrumentation, including enzyme immunoassay analysis of salivary, and blood/plasma biomarkers. Offers training programs for salivary hormone analysis, cardiovascular responses to stress, and activity and sleep monitoring, , and maintains a behavioral observation room suite and sleep laboratory.

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## **Cancer Information and Population Health Resource (CIPHR)**

School of Medicine, LCCC

<https://ciphr.unc.edu/>

The Cancer Information & Population Health Resource provides a prospective data linkage between metrics of cancer incidence, mortality, and burden in North Carolina and data sources at an individual and aggregate level that describe health care, economic, social, behavioral, and environmental patterns.

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# Clinical (Human Data)

## **Clinical and Community Human Assessment and Interventions (CHAI) Core**

NORC, LCCC

<https://sph.unc.edu/norc/chai/>

The Core provides services in the design and implementation of nutrition interventions, including web and mobile applications, graphics development, survey instruments, and the interpretation of data. The Core also supports nutrition assessment in both epidemiological and intervention studies.

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## **Patient Reported Outcomes (PRO) Core**

School of Medicine, LCCC

<https://unclineberger.org/outcomes/cores/procore/>

The PRO Core helps cancer outcomes researchers collect data directly from patients. PRO Core provides consultation regarding design and implementation of patient-reported data capture, at both the proposal and protocol writing phases of research. The PRO Core system enables the administration of surveys via the web, interactive voice response (IVR), and computer-assisted telephone interviewing (CATI); is able to interface with other modes of data collection such as Fitbit pedometer; and allows advanced survey scheduling and reporting.

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## **Rapid Case Ascertainment**

School of Medicine, LCCC

<https://unclineberger.org/pathologyservices/>

The Rapid Case Ascertainment Core provides support to the N.C. Central Cancer Registry and local hospitals for rapid case ascertainment and facilitates cancer prevention and control research that requires early contact with patients

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# Biospecimen Processing and Collection

## Biospecimen Processing Facility

Gillings School of Global Public Health

<https://bsp.web.unc.edu/>

The UNC BSP Facility is a centralized, quality controlled and quality assured facility for the processing of human biospecimens. In addition to laboratory services, the facility provides a scientific resource for investigators seeking advice on study design including specimen collection and storage methods. This core is CAP certified.

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## **Respiratory TRACTS Core**

School of Medicine, Marsico Lung Institute

<https://www.med.unc.edu/marsicolunginstitute/respiratory-tracts/>

See entry in Clinical (Laboratory/Drug Development)

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## **Biobehavioral Laboratory**

School of Nursing

<https://bbl.unc.edu/>

See entry under Clinical (Behavioral/Patient)

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# Immunoassays and Cytometry

## **Biobehavioral Laboratory**

School of Nursing

<https://bbl.unc.edu/>

See entry under Clinical (Behavioral/Patient)

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## **CFAR HIV/STD Laboratory Core**

School of Medicine, Center for AIDS Research, LCCC

<http://unccfar.org/portfolio/hiv-std-laboratory-core/>

See entry under Clinical (Laboratory)

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"I can really extend my research to incorporate pretty much any technique that you could imagine, because they're represented through our core facilities here at  
UNC."

**BEN PHILPOT, PHD**

KENAN DISTINGUISHED PROFESSOR  
DIRECTOR, UNC NEUROSCIENCE CENTER

## **Flow Cytometry Core** **School of Medicine**

<https://www.med.unc.edu/flowcytometry/>

The UNC Flow Cytometry Core Facility (FlowCore) provides state-of-the-art flow cytometry services to our customers. Skilled staff provides help with sample acquisition, sorting, data analysis, and experimental design. Training is available to enable investigators and their staff to run the analyzers themselves at reduced cost.

Instruments available include Becton Dickinson LSRFortessa, Thermo Fisher Attune NxT, Amnis ImageStreamX Mark II, and Cyttek Aurora. The core also maintains licenses for customers for FloJo software.

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## **Mass Cytometry Core Facility** **School of Medicine**

<https://www.med.unc.edu/masscytometry/>

Mass Cytometry combines elements from flow cytometry and inductively-coupled plasma mass spectroscopy. The core provides assistance with mass cytometry panel design, protocol support, antibody procurement, data acquisition and basic support for single cell data analysis in Cytobank.

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## **Respiratory TRACTS Core**

School of Medicine, Marsico Lung Institute

<https://www.med.unc.edu/marsicolunginstitute/respiratory-tracts/>

[See entry in Clinical \(Laboratory/Drug Development\)](#)

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# Structural Biology and Analytical Chemistry

## Advanced Translational Pharmacology & Analytical Chemistry Lab

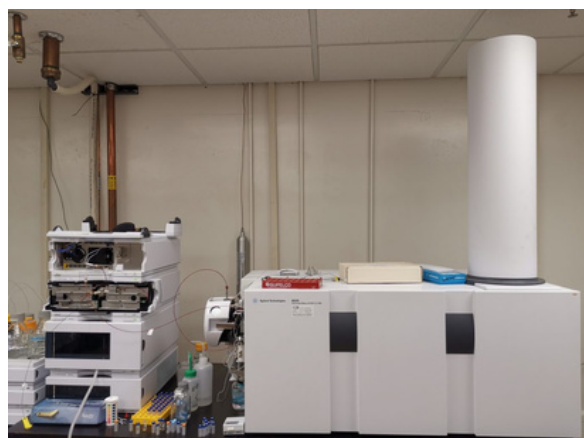
Eshelman School of Pharmacy, LCCC

<https://pharmacy.unc.edu/research/faculty-labs/atpac/>

The ATPAC core lab provides bioanalytical services including LC-MS assay development, validation and analysis of samples to quantify a wide variety of drugs, ranging from small molecule therapeutics to complex drugs such as monoclonal antibodies, drug conjugates and polymers. The lab is equipped to support your entire project: formulation development and CMC studies, assistance in PK/PD study design, LC-MS/MS or ICP-MS assay development, quantification of drugs from biological samples, PK/PD analysis and report generation.

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Agilent 6520 Accurate-Mass Quadrupole Time-of-Flight (Q-TOF) MS in the Biomarker Mass Spectrometry Facility



## **Atomic Absorption Spectroscopy Lab** Gillings School of Public Health, NORC

<https://norc.unc.edu/research-core/atomic-absorption-spectrometry-lab/>

The Atomic Absorption Spectrometry Lab provides analysis that is used to determine the levels of arsenate, methylated and other organic forms of arsenic in solutions and/or matrices.

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## **Biomarker Mass Spectrometry Facility** Gillings School of Public Health

<https://bmsf.web.unc.edu/>

The Biomarker Mass Spectrometry Facility provides critical analytical support to UNC researchers for qualitative and quantitative assessment of environmental contaminants and biomarkers using mass spectrometry.

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## **Biomolecular NMR Facility**

School of Medicine, Center for Structural Biology

<https://www.med.unc.edu/csb/nmr>

The UNC Biomolecular NMR Laboratory supports research into the structure and dynamics of biological molecules. Research applications include macromolecular structure and dynamics--cryoprobes are available for small molecules and biological applications, including small molecule and natural product NMR--and fragment-based drug discovery. The core is also able to support NMR-based metabolomics studies. We also run a helium recovery system to recycle helium for the NMR cores on campus.

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# Biochemistry

## **CFAR Clinical Pharmacology and Analytical Chemistry**

School of Medicine, Center for AIDS Research, LCCC

<http://unccfar.org/portfolio/pharmacology-analytical-chemistry/>

See entry under Clinical (Laboratory and Drug Development)

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## **Chemistry Department Mass Spectrometry**

College of Arts and Sciences, Chemistry Department

<https://chem.unc.edu/critcl-main/critcl-mass-main/>

Our laboratory specializes in small molecule mass spectrometry analysis using quantitative mass spectrometry, liquid chromatography separations, structural elucidation, MS/MS & MS<sub>n</sub> fragmentation mass spectrometry, complex mixture analysis, molecular formula confirmation, high resolution and accurate mass analysis, & trace metal determination/quantitation, metabolomics and lipidomics.

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## **Chemistry Department NMR Facility**

College of Arts and Sciences, Chemistry Department

<https://chem.unc.edu/critcl-main/critcl-nmr/>

The Chemistry NMR Facility maintains and trains customers on six spectrometers. We have extensive capabilities, including highly sensitive cryoprobes, for the detection of <sup>1</sup>H, <sup>2</sup>H, <sup>13</sup>C, <sup>15</sup>N, <sup>19</sup>F and <sup>31</sup>P. Gradient enhanced pulse sequences and variable sample temperature control are available for 1D and multidimensional experiments.

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## **Chemistry X-Ray Facility**

College of Arts & Sciences, Chemistry Department

<https://chem.unc.edu/critcl-main/critcl-x-ray/>

Service includes SC-XRD structure determination and various PXRD techniques, and user training is available for both SC- and powder XRD techniques. Additional experiments at Argonne National Laboratory, SCrAPS – Synchrotron Crystallography at Advanced Photon Source, are carried out three times a year for samples that diffract too weakly using the conventional radiation source at the facility.

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## **Cryo-EM Core**

School of Medicine, Center for Structural Biology

<https://www.med.unc.edu/cryo-em/>

The Cryo EM Core provides researchers at UNC Chapel Hill with the resources, training, and technical assistance required to do high-resolution cryoEM experiments:

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## **Macromolecular Interactions Facility (MacInFac)**

School of Medicine, Center for Structural Biology

<https://www.med.unc.edu/csb/macinfac>

MacInFac provides instrumentation and resources for biophysical characterization of biological macromolecules and their interactions with cognate ligands. Core instrumentation include: surface plasmon resonance-based and bio-layer interferometry-based biosensors; analytical ultracentrifuges; a spectrofluorometer; differential scanning and isothermal titration calorimeters, a circular dichroism spectropolarimeter; static and dynamic light scattering instruments; a fluorescence microplate reader; a nano-differential scanning fluorimeter, and a microscale thermophoresis (MST) instrument.

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# Biochemistry

## **Macromolecular X-Ray Crystallography**

School of Medicine, Center for Structural Biology

<https://www.med.unc.edu/csb/mx>

The MX core offers facilities and expertise for growing diffraction-quality single crystals of proteins, nucleic acids, small molecules, and complexes thereof and conducts macromolecular x-ray diffraction experiments. The core also offers training and support to customers who want to independently use the instrumentation.

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## **Metabolomics and Exposome Laboratory**

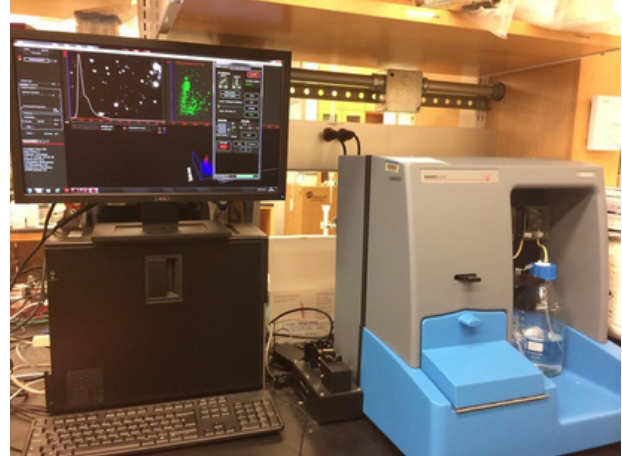
Gillings School of Public Health

<https://norc.unc.edu/research-core/metabolomics/>

The core is located on the Kannapolis campus and provides cutting edge nutritional metabolomics services, biochemistry methods, and molecular biology techniques for nutrition research including mass spectrometry, NMR spectroscopy, cytokine arrays, and atomic absorption spectroscopy. The core facilitates the use of biomarkers for nutritional epidemiological and intervention studies, provides access to state-of-the-art techniques and equipment to bench scientists, and provides cost-effective assays for investigators without lab facilities.

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NanoSight Nanoparticle tracking equipment



## **Metabolomics and Proteomics Core**

### **School of Medicine, LCCC, NORC**

<https://www.med.unc.edu/proteomics-metabolomics/>

Provide researchers with state-of-the-art analysis of proteins and metabolites from tissues, cells and other biological samples. Specific applications include: identify purified proteins and co-immunoprecipitated proteins. Identify proteins in from complex mixtures and quantify differences in protein abundance using labeled (SILAC, TMT) or label-free approaches. Identify of post-translational modifications such as acetylation, ubiquitylation, phosphorylation and sulfhydryl modifications. Determine the exact mass of purified peptides and proteins. In Fall 2024, the core will begin offering metabolomics services.

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## **Nanomedicines Characterization Core (NCore)**

### **School of Medicine, Eshelman School of Pharmacy**

<https://ncore.web.unc.edu/>

NCore offers researchers an opportunity for in-depth characterization of nanomaterials and carrier-mediated agents (CMA) including: chemical composition, number average molar mass, weight average molar mass, polydispersity, molecular weight distribution, size, gyration radius, size distribution, shape, surface charge, count number of nanoparticles, solubility (second virial coefficient), isotope analysis, analytical evaluation of nanoparticle encapsulated and released drug or agent stability and released rates, endotoxin contaminant/sterility study, UV/Vis spectroscopy and temperature correlation, etc.

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# Biochemistry

## High-Throughput Peptide Synthesis and Array Facility School of Medicine

<https://www.med.unc.edu/csb/unc-peptides>

The UNC HTPSA Facility provides researchers with high quality services for peptide synthesis, purification, and characterization of synthetic peptides and preparation of custom designed peptide arrays. We specialize in synthesis of multiply modified peptides containing PTMs, unnatural amino acids, and fluorescent tags.

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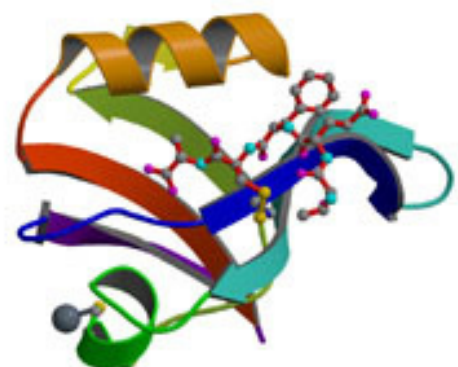
## R.L. Juliano Structural Bioinformatics Core School of Medicine, Center for Structural Biology

<https://www.med.unc.edu/csb/sbi>

We provide consultations and collaborations on research studies requiring computational structural biology methods. The analyses available through the core are not limited to the study of static structures, but also include molecular dynamics studies for analyzing the contribution of dynamic and collective motions to macromolecular functionality. When experimental structures are not available, molecular modeling studies, whereby the structure of the protein of interest is predicted using known template structures, provide 3D atomic data.

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Structure visualization services are offered by the  
R.L. Juliano Structural Bioinformatics Core



# Fabrication, Matter Characterization, and Engineering

**BeAM Design Center**  
College of Arts and Sciences  
<https://designcenter.unc.edu/>

Our mission is to facilitate research through consultation, innovative design, fabrication and implementation assistance. Our project scope ranges from modest modifications and repairs to design and fabrication of complex field research installations.

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**Chapel Hill Analytical & Nanofabrication Lab**  
College of Arts & Sciences, Department of Chemistry  
<https://chanl.unc.edu/>

CHANL boasts 26 major instruments for nano/micro fabrication and characterization. Imaging capabilities include: Scanning and transmission electron microscopy, atomic force, nanoindentation, optical imaging. Nanofabrication instruments include: Lithography, thin film deposition, ion beam milling, deep reactive ion etching. Spectroscopy capabilities include: Fourier transform, x-ray photoelectron, x-ray diffraction, microspectrophotometry, ellipsometry.

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# Fabrication etc.

**Chemistry Department Electronics Facility**  
College of Arts & Sciences, Chemistry Department  
<https://chem.unc.edu/critcl-main/critcl-electronics/>

The electronics facility provides consultation, electronic circuit research and development, construction, repair, maintenance, and troubleshooting services.

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## **Computer Integrated Systems for Microscopy & Manipulation**

College of Arts & Sciences  
<https://cismm.web.unc.edu/>

CISMM is an NIH supported laboratory that designs and builds microscope-based systems for applying, and assessing the effects of, forces on cells and living systems. Systems developed or modified in the lab include microfluidics devices, magnetic tweezers (“3DFM”) systems, systems to assess the rheology of mucus or other biofluids (microbead or cone and plate), Traction Force Membranes, and Atomic Force Microscope - based vertical light sheet imaging/force assessment.

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## **FastTraCS Design Lab** School of Medicine, TraCS

<https://tracs.unc.edu/index.php/services/fasttracs/design-lab>

the FastTraCS Design Lab is equipped with state-of-the-art facilities for design, rapid prototyping, assembly, and comprehensive testing and validation. These labs not only support the development of promising medical devices and technologies but also facilitate both software and hardware advancements critical to medical applications.

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"Working with core directors at UNC has been like having my own science fairy godmothers; the core directors took the daunting task of synchronizing experiments among multiple facilities and turned it into a walk in the park. Without the UNC core facilities I would not have achieved the same quality of research. "

REBECCA CASAZZA  
PHD CANDIDATE, LAZEAR LAB  
DEPARTMENT OF MICROBIOLOGY AND  
IMMUNOLOGY

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**Soft Matter Characterization Core**  
College of Arts & Sciences, Applied Physical Sciences  
<https://smcore.unc.edu/>

The UNC Soft Matter Core Lab offers sample analysis and professional training services and access to state-of-the-art, high performance analytical instrumentation including Thermogravimetric Analyzer, Differential Scanning Calorimeter, Rheometer, Dynamic Mechanical Testers, and MALDI-TOF Mass and NanoIndenter Spectrometers.

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# Genetics/Genomics/ Vector Production

## Advanced Analytics Core

School of Medicine, Center for Gastrointestinal Biology &  
Disease

<https://www.med.unc.edu/cgibd/cores/advanced-analytics>

The CGIBD Advanced Analytics (AA) Core provides bulk and single-cell genomic and proteomic analysis and high-throughput qPCR.

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## BRAIN Initiative Viral Vector Core (NeuroTools)

School of Medicine, Neuroscience Center

<https://www.unc-neurotools.org/>

The Core will have two main purposes: 1) Produce and disseminate affordable, high-quality AAV, rabies, and lenti viral vectors to the neuroscience community including newly developed vectors, custom preps and curated stocks and 2) Collaborate with BRAIN researchers to optimize vector design and prep conditions for optimal performance and serve as an educational resource for viral vector production.

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Genomic sequencing equipment in the HTSF.





**CRISPR Core**  
Eshelman School of Pharmacy  
<https://ddi.unc.edu/crispr/>

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See entry under Clinical (Laboratory/Drug Development)

**Functional Genomics Core**  
School of Medicine  
<https://www.med.unc.edu/functionalgenomics/>

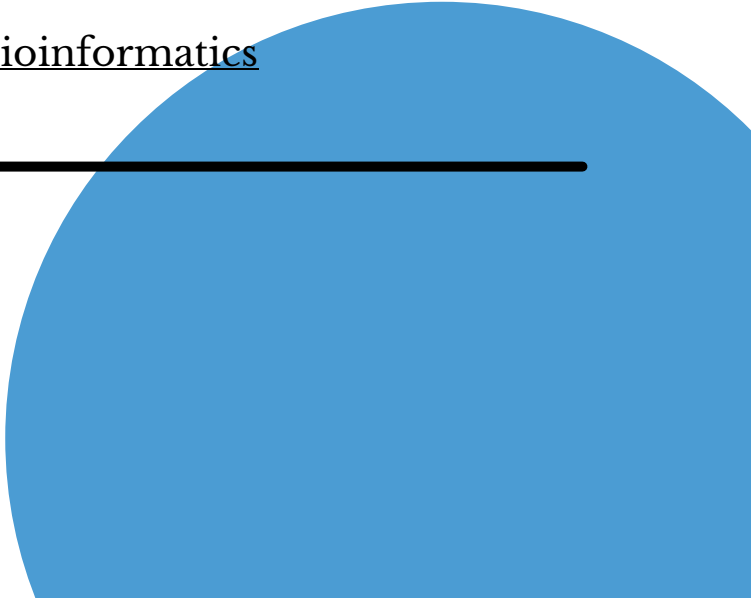
The Functional Genomics Core provides expression profiling and SNP genotyping (Affymetrix) services.

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**Clinical Genomic Analysis Core (GENYSIS)**  
School of Medicine, Program for Precision Medicine in  
Health Care  
<https://www.med.unc.edu/genysis/>

See entry under Bioinformatics

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# Genomics

## **High-Throughput Sequencing Facility**

School of Medicine, LCCC

<https://www.med.unc.edu/genomics/>

The High Throughput Sequencing Facility (HTSF) offers comprehensive library services, NextGen sequencing and alternative technologies including long reads. The core offers sequencing with both a NovaSeq6000 and the Complete Genomics T7 sequencer, which can offer a cost savings. In addition to generating high quality genomic and transcriptomic data, we also provide technological support to users to ensure maximum data value.

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## **Lenti shRNA Core**

School of Medicine

<https://www.med.unc.edu/lenti-shrna>

The Lenti-shRNA Core Facility provides the research community with the facilities and the know-how to deliver lentiviral vectors encoding shRNAs and cDNAs to a variety of cell types.

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## **Microbiome Core**

School of Medicine

<https://www.med.unc.edu/microbiome/>

[See entry under Cell and Tissue Biology](#)

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**Translational Genomics Lab**  
School of Medicine, LCCC  
<https://unclineberger.org/tgl/>

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TGL is a medium throughput facility providing comprehensive genomic services for investigators by employing Next Generation Sequencing (NGS) and NanoString™ technologies. In addition, TGL can produce single-cell gene expression libraries using the 10X platform. TGL only supports cancer-related research.

**Vector Core**  
School of Medicine  
<https://www.med.unc.edu/genetherapy/vectorcore>

The Vector Core had extensive experience in manufacturing research grade vectors: AAV, Lentiviral, and Retroviral Vectors as well as an extensive inventory of in stock vectors.

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**Vironomics Core**  
School of Medicine  
<https://www.med.unc.edu/vironomics>

The Vironomics Core facilitates research at UNC by performing large-scale real time quantitative PCR reactions, amplicon generation, and ~200-600bp next generation sequencing.

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# Bioinformatics

*The below cores supporting bioinformatics are accessible to all customers. Other center-specific bioinformatics and biostatistics support may exist to support members of specific centers, but they are not include din this list.*

## **Bioinformatics and Analytic Research Collaborative School of Medicine**

<https://www.med.unc.edu/barc/>

The BARC aims to provide bioinformatics expertise and analysis to researchers across the university and beyond for high throughput data. We analyze, visualize, interpret, and manage genomic data while also offering custom solutions to fit our researchers' needs

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## **Biomedical Research Imaging Center: Image Analysis School of Medicine**

<https://www.med.unc.edu/bric/image-analysis/>

The Image Analysis Core is devoted to the development of novel image analysis methods and tools, and their applications to various clinical research and trials. The developed methods include deformable registration (HAMMER), deformable segmentation (AFDM), and multivariate pattern classification algorithms. It also supports the image storage and analysis needs of scientists in UNC and provides services for brain structural and functional analysis, small animal imaging analysis, visualization, and more.

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**Clinical Genomic Analysis Core (GENYSIS)**  
School of Medicine, Program for Precision Medicine in  
Health Care

<https://www.med.unc.edu/genysis/>

The GENYSIS Core provides clinicians with bioinformatics support, variant analysis, clinical reporting, and consultation/post-test services.

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**R.L. Juliano Structural Bioinformatics Core**  
School of Medicine, Center for Structural Biology

<https://www.med.unc.edu/csb/sbi>

See entry under Structural Biology and Analytical Chemistry

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# Light and Electron Microscopy

## **Biology Microscopy Core**

College of Arts & Sciences, Department of Biology

<https://tarheels.live/biologymicroscopycore/>

We provide the Department of Biology and broader UNC community with access, training and assistance with a wide array of high-end imaging systems, for epifluorescence, TIRF, confocal, spinning disk and super-resolution, as well as image analysis.

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## **Chapel Hill Analytical & Nanofabrication Lab**

College of Arts & Sciences, Department of Chemistry

<https://chanl.unc.edu/>

CHANL provides electron microscopy. See entry under Fabrication and Engineering.

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## **Hooker Imaging Core**

School of Medicine

<https://www.med.unc.edu/cellbiophysio/research-facilities/hic/>

HIC supports user-based light microscopy and transmission electron microscopy (TEM) and some TEM sample preparation services. We train users on the appropriate instruments and they perform their experiments independently. We have four confocal microscopes, widefield microscopy for fluorescence, DIC, and other light microscopy modalities. We have a computer with several software packages for offline image processing.

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**Microscopy Service Lab**  
School of Medicine, LCCC  
<https://www.med.unc.edu/microscopy/>

We provide training, assistance and services in light microscopy, electron microscopy and image analysis. We have experience with confocal, light-sheet, wide-field fluorescence, dark-field, and polarization microscopy. Tiling, multi-day live-cell experiments, FRAP, FRET, spectral imaging and other experimental designs are available. Our EM services include SEM prep, embedding, ultrathin sections, negative staining and immunoEM. Transmission and scanning electron microscopy available.

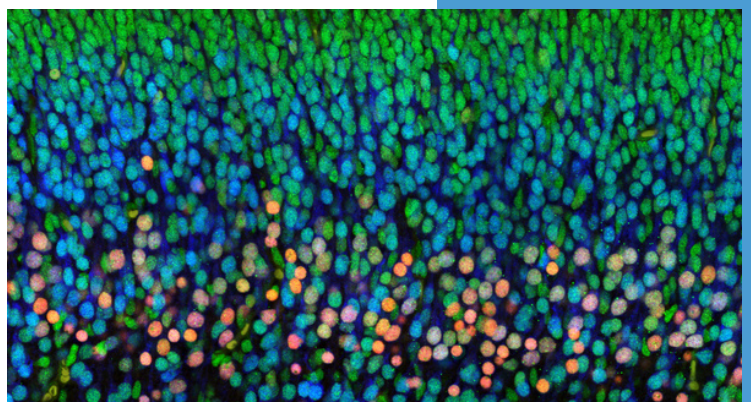
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**Neuroscience Microscopy Core**  
School of Medicine, Neuroscience Center  
<https://www.med.unc.edu/neuroscience/core-facilities/neuro-microscopy/>

The core provide a full spectrum of advanced systems for cellular and molecular imaging of in vitro and in vivo samples, implements new imaging technologies, particularly related to real time and tissue clearing based imaging of neurodevelopment and neural functions, and offers training, consultation, data analysis, image processing, and centralized technical expertise to support the imaging needs of neuroscientists and other researchers.

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Photo courtesy Bonnie Taylor  
Blake and the Neuroscience  
Microscopy Core





# Neuroimaging and Neurobiology

**Biobehavioral Laboratory**

School of Nursing

<https://bbl.unc.edu/>

See entry under Clinical (Behavioral/Patient)

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**Biomedical Research Imaging Center: Human Imaging**

School of Medicine

<https://www.med.unc.edu/bric/human-imaging/>

The mission is to provide magnetic resonance imaging services for research studies utilizing a Siemens 3T PrismaFit 3T MRI, Siemens Biograph mMR PET/MR, Siemens Biograph mCT PET/CT and Siemens 7T MRI scanners.

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**Biomedical Research Imaging Center: Image Analysis**

School of Medicine

<https://www.med.unc.edu/bric/image-analysis/>

See entry under Bioinformatics

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## **Biomedical Research Imaging Center: Radiochemistry** **School of Medicine**

<https://www.med.unc.edu/bric/radiochemistry/>

The Radiochemistry facility contains all the equipment needed to support radiopharmaceutical development and production for molecular imaging studies.

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## **Biomedical Research Imaging Center: Small Animal Imaging/MRI**

School of Medicine, Center for Animal MRI

<https://www.med.unc.edu/bric/small-animal-imaging/>  
<https://www.med.unc.edu/bric/camri/>

[See entry under Animal Models](#)

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## **Clinical Translational Core\***

School of Medicine, IDDRC, CIDD

<http://www.cidd.unc.edu/research/clinicalTranslationalCore.aspx>

The Clinical Translational Core includes services to maximize participation of research subjects in IDDRC projects (the Participant Registries), services to support development of image processing tools, multi-modal brain imaging, EEG/ERP and eye tracking (the Brain-Behavior Measurement Laboratories), and consultation on design of behavioral studies, including technical assistance to train research assistants on test administration and assistance building clinical assessment teams (Behavior Navigator).

\*=Limited to IDDRC members.

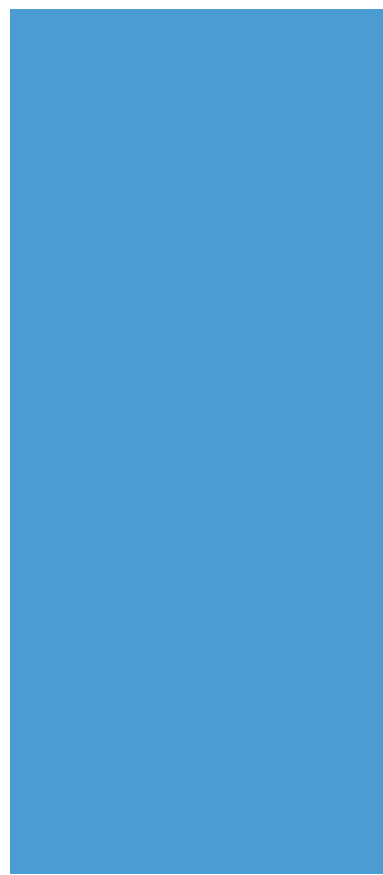
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## **Radiologic Science DXA Body Composition Core School of Medicine**

**<https://www.med.unc.edu/ahs/radisci/labs/>**

DXA is a unique imaging procedure that allows for the calculation and analysis of differential body tissues within a subject and allows for the collection of bone mineral density data. DXA imaging is performed by ARRT registered technologists trained in the rigors of clinical trial imaging and data collection.

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## CONTACT US

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