

Shared Biomedical Resource Facilities at UNC Chapel Hill

Expertise. Innovation. Collaboration.



UNC School of Medicine
Office of Research Technologies

March 2022

What is a shared biomedical resource facility?

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

"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

"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

UNC's research enterprise is supported by a broad network of over 70 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.

Do all cores at UNC use the same business model?

UNC Chapel Hill supports multiple types of cores:

- **Full Service Recharge Cores** use OSR-approved rates to fulfill a "break-even" business model-- customer rates are solely determined by the cost to provide those services. The cores are open-access to anyone who wants to use their services.
- **Collaborative Core Facilities** may be open-access, fee-for-service, or may operate with a different business model. These cores are generally dependent on grant support.
- **Limited Access Cores** only serve a restricted group of PIs who are associated with a particular grant and are not fee-for-service.

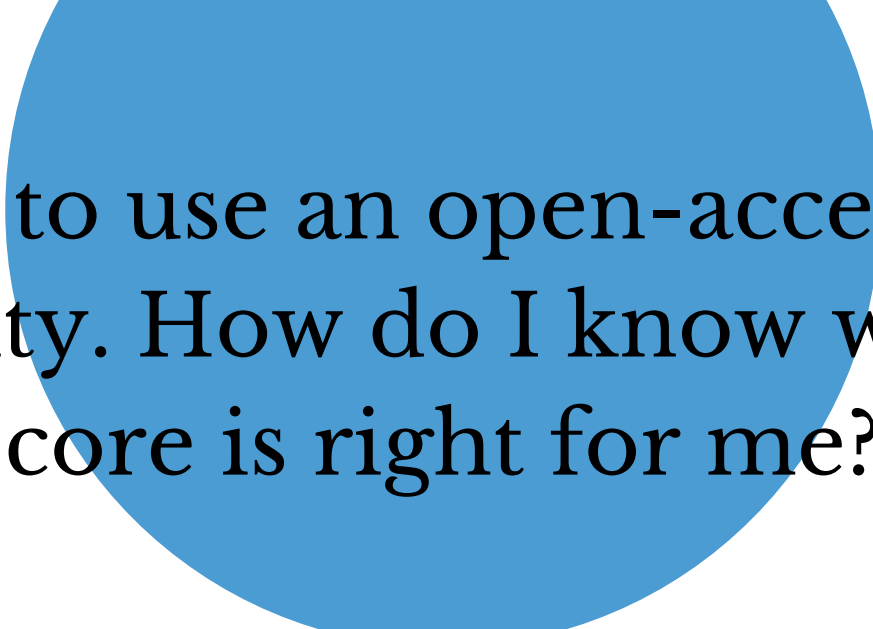
While we value all UNC cores, this document will highlight cores with OSR-approved rates and operating plans

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.



I want to use an open-access core facility. How do I know which core is right for me?

Though some core facilities offer similar services, each core is unique--some are subsidized by specific departments or centers, reducing the cost to other members.

Others may have more experience with a specific aspect of your research. Some allow customers to use the equipment housed in the core, while others provide more turn-key services. We encourage you to reach out to the core directors for an initial consultation, which is often free of charge.

[Click here](#) for a comprehensive database of the biomedical core facilities at UNC. Search by keyword or for cores containing specific technology or equipment.

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

Rigor and Reproducibility

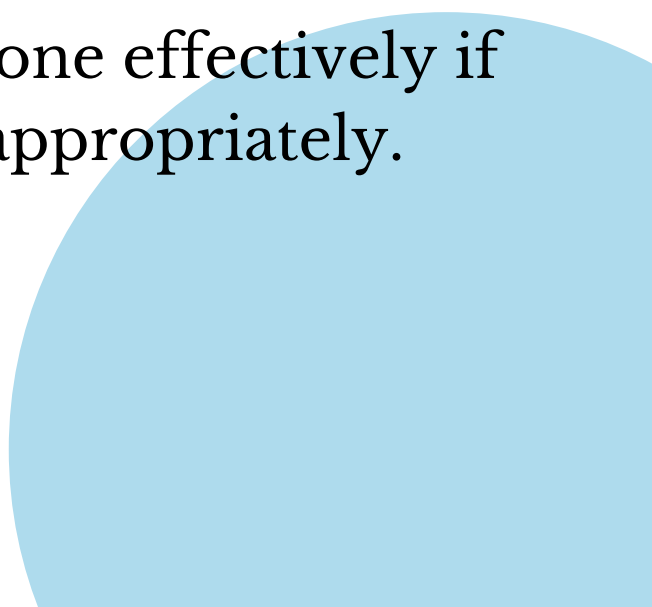
Core facilities at UNC are held to NIH's standards on Rigor and Reproducibility. They are committed to ensuring the research they support also conforms to these standards.

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.



About This Guide

UNC core facilities have been divided into the following categories. Some cores' services span multiple categories and may be cross-listed. Browse all the selections, or click on one of the following links to jump to a section of interest.

[Animal Models](#)

[Biochemistry](#)

[Cell and Tissue Biology](#)

[Clinical \(Laboratory and Drug Development\)](#)

[Clinical \(Behavioral/Patient\)](#)

[Fabrication and Engineering](#)

[Genomics](#)

[Imaging](#)

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.

Animal Models

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.

Animal Metabolism Phenotyping Core

Gillings School of Global Public Health, Nutrition Obesity
Research Center

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

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 more.

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

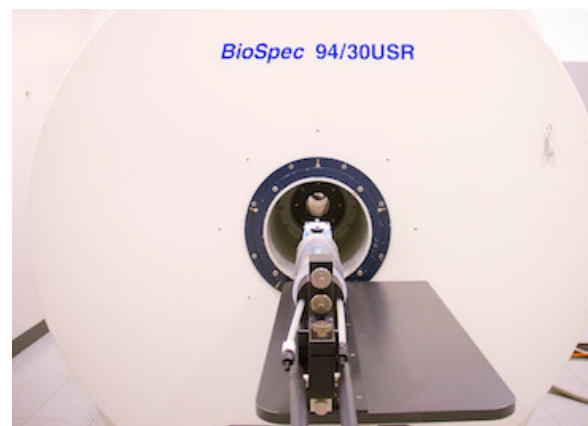
Animal Studies Core
School of Medicine, LCCC
<https://www.med.unc.edu/ascore>

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 and SCID mice.

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/>

BRIC Small Animal Imaging provides imaging modalities including PET/CT, SPECT/CT, High Resolution CT, Bioluminescence/Fluorescence and Ultrasound. The Small Animal MRI core Our facility provides a wide variety of small animal MRI services to investigators within or outside UNC.



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

Animal Models

Cardiovascular Physiology & Phenotyping Core School of Medicine, McAllister Heart Institute <https://www.med.unc.edu/mhi/advsurgmodels>

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.

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.

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.

Mouse Behavioral Phenotyping Core
School of Medicine, Carolina Institute for Developmental
Disabilities
<http://www.cidd.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/mmrcc/>

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

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.

Zebrafish Aquaculture Core

School of 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

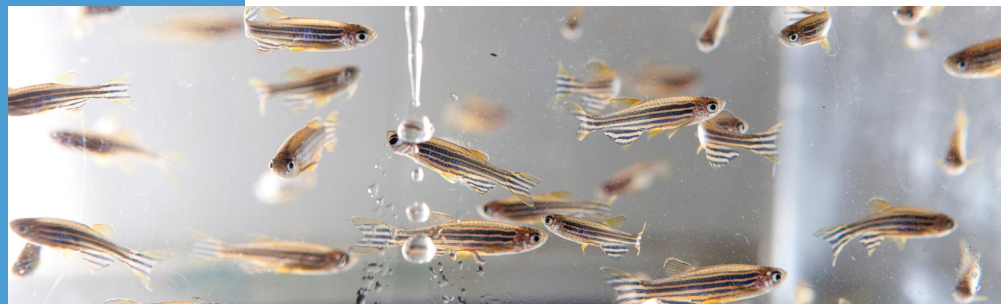


Photo courtesy of UNC School of Medicine and UNC Health

Biochemistry

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.

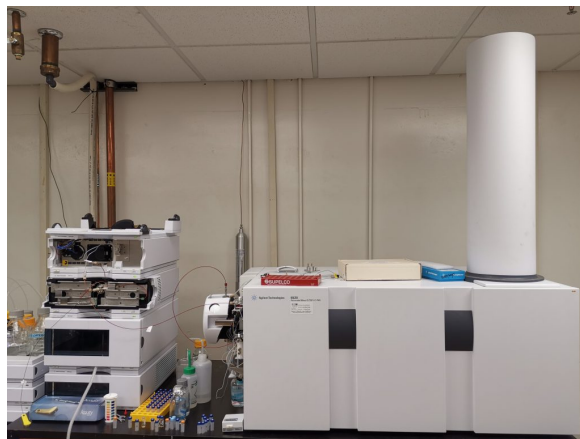
Atomic Absorption Spectrometry Lab

Gillings School of Global Public Health, Nutrition Obesity
Research Center

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

A component of the UNC NORC's Metabolomics and Metabolomics Core, 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.

Biochemistry



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

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.

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. We also run a helium recovery system to recycle helium for the NMR cores on campus.

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.

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)

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_n fragmentation mass spectrometry, complex mixture analysis, molecular formula confirmation, high resolution and accurate mass analysis, & trace metal determination/quantitation, metabolomics and lipidomics.

Biochemistry



Varian INOVA Neo 600 MHz housed in the Chemistry NMR Facility

Chemistry Department NMR Facility

College of Arts and Sciences, Chemistry Department

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

After the appropriate training, individuals may use any of the NMR Facility's six spectrometers depending on the application.

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.

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:

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 (SPR)-based and bio-layer interferometry (BLI)-based biosensors; analytical ultracentrifuges; a spectrofluorometer; differential scanning and isothermal titration calorimeters, including two fully-automated ITCs, a circular dichroism spectropolarimeter; static and dynamic light scattering instruments; a fluorescence microplate reader; a nano-DSF (nano-differential scanning fluorimeter), and a microscale thermophoresis (MST) instrument.

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.

Biochemistry

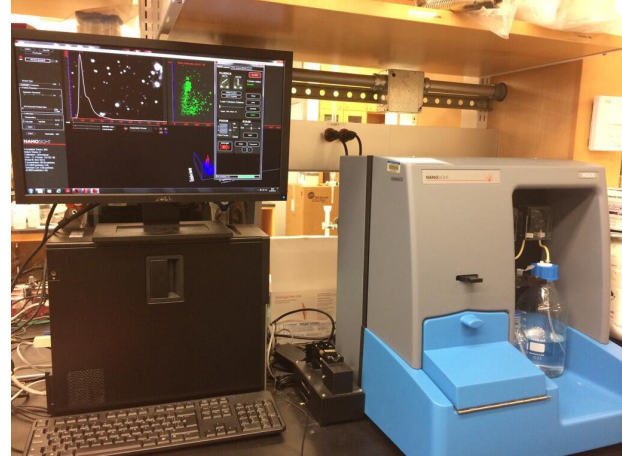
NORC Metabolism and Metabolomics Core Gillings School of Public Health, NORC <https://sph.unc.edu/norc/metabolism/>

The core provides cutting edge nutritional metabolomics services, biochemistry methods, and molecular biology techniques for nutrition research. 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.

Michael Hooker Proteomics Core School of Medicine, LCCC <https://www.med.unc.edu/proteomics/>

Provide researchers with state-of-the-art analysis of proteins 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.

NanoSight Nanoparticle tracking equipment



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

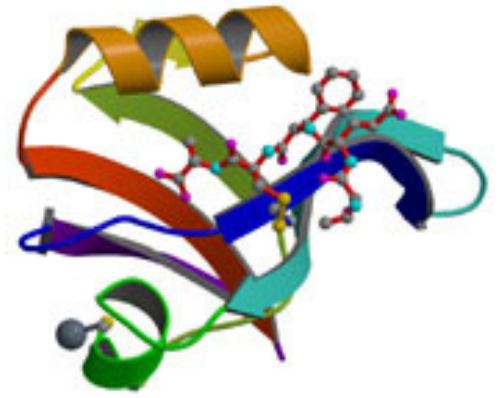
NCore offers researchers an opportunity for in-depth characterization of nanomaterials and carrier-mediated agents (CMA) including: chemical composition, number average molar mass, weight average molar mass, polydispersity, molecular weight distribution, size, gyration radius, size distribution, shape, 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.

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.

Biochemistry

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



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.

"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

Cell and Tissue Biology

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

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)

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..

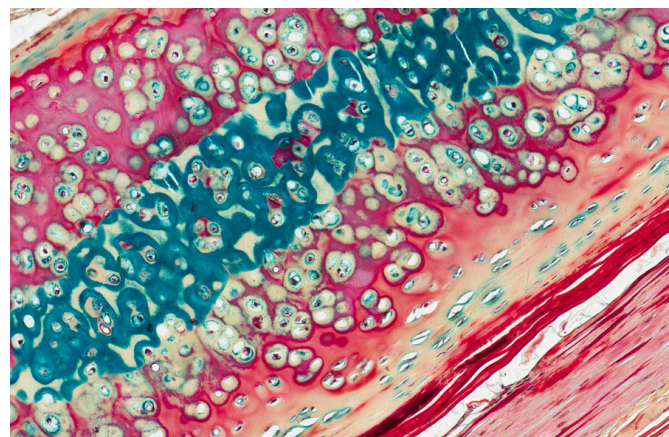
Cell and Tissue Biology

DELTA Translational Services Core
Adams School of Dentistry
<https://cytokine.web.unc.edu/>

See entry in Clinical (Laboratory/Drug Development).

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.



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.

Immune Monitoring and Genomics Facility **School of Medicine, LCCC**

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

IMGF evaluates anti-tumor immune responses in the context of immunotherapy by using multiplex soluble mediator assays and genomics to characterize the tumor immune microenvironment and genetic analyses of T and B cell receptor repertoires. A major objective is the correlation of immune and tumor cell molecular, genetic and functional characteristics with clinical trial outcomes.

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.

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), digital pathology, and digital spatial profiling (protein, RNA). The PSC has access to UNCH's tissue archive, facilitates pre-clinical and clinical studies, and offers study design support to investigators.

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.

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

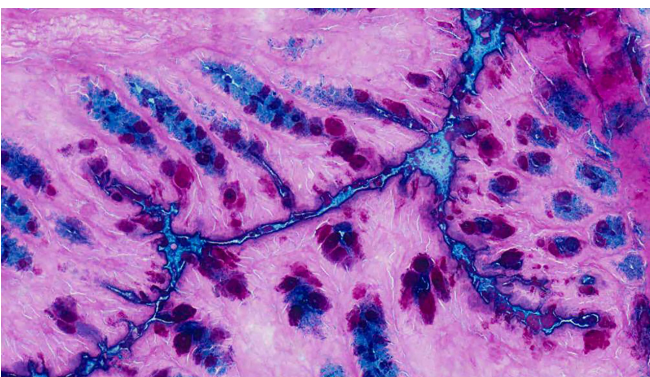
<https://unclineberger.org/tissue-procurement>

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.

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.



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.

Biobehavioral Laboratory

School of Nursing

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

See entry under Clinical (Behavioral/Patient).

Biospecimen Processing Facility

Gillings School of Global Public Health

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

See entry under Cell and Tissue Biology.

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

Clinical (Laboratory)

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.

CFAR HIV/STD

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*. In addition, the HIV/STD Core provides specimen processing for clinical trials taking place at UNC.

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

DELTA Translational Services Core

Adams School of Dentistry

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

The core provides support to projects exploring the cell-type specific mediated immune dysfunction and immune-mediated disorders, Offers technical expertise and access to flow cytometric immuno- and cell phenotyping and DNA cell-cycle analysis, interrogating genetic-based cellular responses (DNA, RNA, mRNA, miRNA), cellular soluble mediators, bone morphometric analysis with microCT analysis, and supports Research Rigor and Reproducibility through access to: study design, methodologic and data analysis consulting efforts, and providing sample collection, processing, barcoding and storage of biological samples.

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

"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

Clinical (Laboratory)

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

See entry under Biochemistry

Organ Injury Biomarker Core
Eshelman School of Pharmacy
<https://oibc.web.unc.edu/>

The OIBC is a full service core facility dedicated to providing assistance to investigators in understanding and utilizing traditional and recently discovered biomarkers of organ injury. We offer support in the areas of: study design, biomarker quantifications, and interpretation of results. While we focus on liver, kidney, and cardiac injuries in clinical and nonclinical specimens; we may be able to include other organs based on the needs of the researchers we serve.

"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



Precision Nutrition Core
Gillings School of Global Public Health, NORC
<https://sph.unc.edu/norc/precisionnutrition/>

The Precision Nutrition 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.

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

See entry under Cell and Tissue Biology

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

See entry under Cell and Tissue Biology

Clinical (Behavioral/Patient)

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.

**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.

**Clinical and Community Human Assessment and
Interventions (CHAI) Core**
Gillings School of Public Health, NORC
<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.

Metabolic and Nutrition Core

UNC Health Care

<https://www.uncmedicalcenter.org/uncmc/care-treatment/nutrition/>

The Metabolic and Nutrition Research Core specializes in the development and production of controlled nutrient meals for feeding studies. The Core is staffed by a registered dietitian and dietetic technicians all experienced in the production of controlled meals, recipes and oral food challenges for research studies.

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.

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

Fabrication 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.

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.

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 trouble-shooting services.

Genomics

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, high-throughput qPCR, and cost-effective immunoassays.

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

BRAIN Initiative Viral Vector Core

School of Medicine, Neuroscience Center

Kim Ritola: kritola@email.unc.edu

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.

Genomics

CRISPR Core

Eshelman School of Pharmacy

<https://ddi.unc.edu/crispr/>

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.

High-Throughput Genomic 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. In addition to generating high quality genomic and transcriptomic data, we also provide technological support to users to ensure maximum data value.



Genomic sequencing equipment in the HTSF.

Immune Monitoring and Genomics Facility

School of Medicine, LCCC

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

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

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.

Mammalian Genotyping Core

School of Medicine, LCCC

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

The MGC provides centralized cost-efficient, high quality genotyping and methylation services using Illumina BeadArray and Infinium microarray assay technologies for Single Nucleotide Polymorphism (SNP) Genotyping, Copy Number Variant (CNV), Loss of Heterozygosity (LOH), Insertions-Deletion (indel), Structural Variant, and DNA Methylation Analysis.

Microbiome Core

School of Medicine

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

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

Genomics

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

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.

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.

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.

Imaging

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.

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.

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](#)

Imaging

CFAR HIV/STD

School of Medicine, Center for AIDS Research, LCCC
<http://unccfar.org/portfolio/hiv-std-laboratory-core/>

The CFAR HIV/STD core provides flow cytometry services. See entry under Clinical (Laboratory and Drug Development)

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.

CHANL equipment and personnel.



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.

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.

Imaging

DELTA Translational Services Core
Adams School of Dentistry
<https://cytokine.web.unc.edu/>

The DELTA Translational Services core provides flow cytometry services.
See entry under Clinical (Laboratory and Drug Development)

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.

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

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.

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.

Imaging

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.

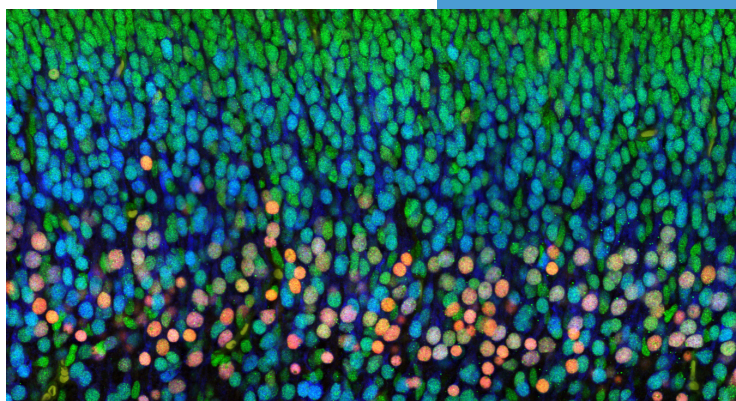
Neuroscience Microscopy Core

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.

Photo courtesy Bonnie Taylor
Blake and the Neuroscience
Microscopy Core





BIOMEDICAL RESEARCH CORE FACILITIES AT UNC CHAPEL HILL

Watch on  **YouTube** *Expertise. Innovation. Collaboration.*

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