



The University of Texas  
Health Science Center at Houston

## Research Resources



*Photography: Nash Baker, 2006  
Assasi, 2006*

**UTHealth**

# **RESEARCH RESOURCES**

## **Delivering Innovative Solutions for the Future**

The University of Texas Houston Health Science Center (UTHealth) is recognized internationally as one of the world's great research universities. UTHealth connects research, education, patient care and outreach in bold, innovative ways. Basic scientists and clinical researchers from all disciplines work together to deliver innovative solutions that create the best hope for a healthier future. Enclosed you will find a list of resources available to help our scientists and clinicians to pursue their research mission.

**Please contact**  
**[SharedResearchResources@uth.tmc.edu](mailto:SharedResearchResources@uth.tmc.edu)**  
**with additional questions.**



# ATOMIC FORCE MICROSCOPY SERVICES

Atomic Force Microscopy (AFM) is a technique for characterizing surfaces and producing topographic images under physiological-like conditions using noninvasive bio-sensing technology. Scanning can be performed in air or in a liquid environment. A range of samples, from living cells down to single molecules, can be imaged. AFM is also an attractive tool for studying the dynamics of cellular endocytosis of nanovectors and the systemic response to biological processes. Measuring the stiffness of samples (Elastic Modulus) is a common use of AFM. The elastic modulus is a useful indication of cell growth, differentiation, disease, or response to treatment. In addition, non-cellular structures, such as nanoparticles or chemical scaffolds, can also be imaged.

## **Services:**

- AFM imaging combined with bright-field/fluorescence microscopy
- Topographical imaging of samples in air or liquid environments
- Time-lapse experiments that show changes in sample morphology or structure
- Studies of local micromechanical properties of samples (elasticity, stiffness, roughness)
- Data analysis for determination of homogeneity of samples, size distribution, position, mapping and 3D imaging
- Post-imaging analysis. Additional measurements can be provided to calculate stress forces, area measurements for regions of interest, estimate roughness or calculating Young's modulus.

## **Contacts for further information:**

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# BIOBANK SERVICES

The Center for Clinical and Translational Sciences (CCTS) Biobank is a repository of human biospecimens and associated data available for collaborative sharing with qualified researchers. The Biobank utilizes a federated model of sharing by which biospecimens and data remain in the custodianship of contributing investigators, the majority of whom conduct research within the Texas Medical Center, prior to the contributor's approval to share with a qualified requesting investigator. The CCTS Biobank facilitates collaborative sharing to expedite research, discovery, and translation to the individual patient by providing a communication link between requesting and contributing investigators; managing requests, contributions, and research investigator agreements; and maintaining Biobank databases for biospecimen and associated data inventory.

Interested researchers can query available biospecimens and data, as well as submit requests, via the Biobank's web-based Sample Location and Enhanced Distribution (SLED) system at the following site: <https://biobank.uth.tmc.edu/BBCIS/>

## **Types of biospecimens available for request:**

- Plasma
- Serum
- DNA
- Peripheral blood mononuclear cells
- Red blood cells
- Saliva
- Urine

Biospecimens and data currently available are from individuals having the following conditions:

- Cardiovascular diseases
- Cancer
- Diabetes and other autoimmune disorders
- Other various disease types

For more information about the CCTS Biobank, including how to submit a request for or contribute biospecimens and/or data, please visit the Biobank website at: <https://www.uth.edu/biobank/index.htm>

## **Contacts for further information:**

[UTHealth\\_CCTS\\_Biobank@uth.tmc.edu](mailto:UTHealth_CCTS_Biobank@uth.tmc.edu)

# BIOINFORMATICS AND HIGH PERFORMANCE COMPUTING

The UTHealth Bioinformatics and High Performance Computing Service Center specializes in the analysis and interpretation of data generated from biomedical experiments. We are experienced in the analysis of microarray and next generation sequencing (RNA-Seq, ChIP-Seq, variant detection) data. Service is also available for custom software and algorithm development. Finally, we assist in the preparation of manuscripts and grants. The service center is managed collaboratively by the University of Texas Health Science center at Houston (UTHSC) and the MD Anderson Cancer Center (MDACC) and receives support from the Center for Clinical and Translational Sciences.

## Services:

### SHORT-TERM PROJECTS

- Gene Annotation
- Microarray Analysis
- Metabonomics Analysis
- Proteomics Analysis
- Genotyping Analysis
- Next-Gen Sequencing Analysis
- High Performance Computing
- Custom Data Analysis
- Consultations and Grant Writing
- Collaborative Grant Writing Assistance
- Initial Consultation

### LONG TERM PROJECTS

- Complex or Long-Term Projects
- Metabonomics

## Contacts for further information:

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713.500.3641

# BIOMEDICAL INFORMATICS GROUP

## UT-BIG (Bioinformatics IT Group)

A diverse group of Informaticians and IT professionals with backgrounds in Computer Science, Applied Mathematics, Project Management, Library Sciences, Biology. We collect, interpret, and manage data for the support of clinical and translational research. As co-investigators we develop new methods for reusing data for research.

### **Services offered:**

**Study Feasibility and Cohort identification:** We can query the CDW to confirm the number of patients that meet criteria for your study. This information can then be used to show feasibility when selecting sample sizes.

**Grant Application:** Provide budget estimates for technical support. Supply application security configurations for IRB approval.

**Regulatory Compliance:** We comply with HIPAA and work closely with the UTHHealth Committee for the Protection of Human Subjects, IT Security, and University Privacy Office. Our team members can provide solutions for appropriately protecting your systems and their data content.

**Custom Solutions:** BIGT<sub>xt</sub> is a text messaging system with two way communication for behavior modification efforts, promoting health education, and sustaining subject participation in studies.

**RedCap:** a web-based data repository which provides for capturing subject information and associated study data. Features include, randomization, multi-site support, mobile data collection and is HIPAA compliant.

**Custom Applications:** If you can dream it, we can build it.

<https://sbmi.uth.edu/uth-big/>

### **Contacts for further information:**

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# CARDIAC CATHETERIZATION SERVICES

The UTHealth Cardiac Catheterization Lab provides a GE Medical Systems Advantx LCN+ Biplane with Advantage workstation. This imaging system is angiographic and radiographic biplane positioner for use with the x-ray system Advantx. It consists of the angiographic biplane positioner, vascular table and x-ray system. The system is used for diagnostic angiographic fluoroscopy and radiography. In addition, with the system, 3-D models can be created from images acquired during a digital subtraction angiography study of the frontal plane. GE's Advantage workstation then reconstructs and displays the image data, and users can manipulate the 3-D images using a variety of software tools.

Current and potential uses of the cath lab include:

1. Percutaneous intervention such as device deployment, vascular intervention and site-specific drug delivery using real-time fluoroscopic guidance.
2. Identification and characterization of vascular anatomy using contrast enhanced angiography
3. Precise percutaneous biopsy using biplane fluoroscopic guidance.
4. Orthopedic and spinal research and intervention
5. Multimodal fusion imaging for anatomical localization
6. Training for interventional cardiologists and radiologists
7. Phantom development for fluoroscopic and CT imaging applications

In addition, the UT cath lab is in close proximity to MD Anderson imaging facilities including MRI, PET CT and CT which are available for use in conjunction with the cath lab. Expertise is available to those within UTHealth and the Texas Medical Center who have a need for this technology for large animal, pre-clinical studies. The catheterization Lab is located on the ground floor of the MD Anderson 3SCRB (CABI) building at the South Campus.

## Services - Equipment Available for Reservation:

- Advantx LCN+ Biplane – biplane angiographic fluoroscopy and radiography system capable of 3-D image reconstruction and image intensifier distortion correction
- GE Advantage Workstation – for reconstruction and manipulation of image data

## Contact for further information:

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713.486.2322



# CELLULAR THERAPY SERVICES

The Cellular Therapy Core (CTC) consists of the **Judith R. Hoffberger Cellular Therapeutics Laboratory** and the **Evelyn H. Griffin Stem Cell Therapeutics Research Laboratory**. The Hoffberger laboratory is located on the 6th floor of the McGovern Medical School Building (MSB) and is focused on translating, scaling-up, validating and supporting IND applications (CMC section) of promising new therapeutic technologies developed by scientists and physicians at a pre-clinical level into clinical-grade processes that can be used to manufacture cell-based and/or tissue engineered products for clinical applications. The Griffin Laboratory is located on the 6th floor of the Behavioral and Biomedical Sciences Building (BBSB) and is an FDA-registered facility accredited by the Foundation for the Accreditation of Cellular Therapy (FACT) for Cellular Therapy Product Processing with more than minimal manipulation. In the Griffin lab, tissues and organs are processed to produce cells for clinical applications in compliance with current Good Manufacturing Practice (cGMP).

## **Services provided by the Cellular Therapy Core include:**

- Early involvement of experts in regulatory issues and process development
- Development and/or translation, optimization, scale-up and validation of manufacturing processes
- Development and writing of Standard Operating Procedures (SOPs)
- Development and validation of protocol-specific quality control (QC) assays
- Support of IND applications (CMC section)
- cGMP-compliant manufacturing of clinical-grade cell and/or tissue engineering products

Please contact us to discuss your specific needs.

## **Contact for further information:**

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713.486.2542

# CENTER FOR ADVANCED MICROSCOPY

The Center for Advanced Microscopy provides state-of-the-art imaging capabilities as well as expertise to those within UTHHealth and the Texas Medical Center who have a need for cutting-edge imaging technology. The instruments housed in the Center, as well as the expert individuals who stand ready to provide training, are available to provide access to vital imaging systems for the purpose of molecular, cellular, tissue and whole animal imaging.

## Services - Equipment Available for Reservation:

- IVIS Lumina XR - live whole animal imaging of longitudinal fluorescence, bioluminescence, and X-ray *in vivo* and *ex vivo*
- Nikon A1 Confocal Laser Microscope System + PicoQuant - confocal with additional platform for assessing fluorescence lifetime
- Nikon A1R Confocal Laser Microscope System - has resonant and spectral detectors
- Zeiss 510 Meta Confocal Laser Scanning Microscope - has a module for structured illumination
- BD LSR Fortessa Cell Analyzer System - 5-laser flow cytometer that allows analysis of up to 13 different fluorochromes plus forward and side scatter
- Flexstation-3 - microplate reader for absorbance, fluorescence, fluorescence polarization, luminescence in high throughput mode
- Lambert LIFA Fluorescence Lifetime Imaging Microscope
- Data Processing Computer which contains: NIS-Elements AR, LI-FLIM, Living Image, MetaMorph, SlideBook, SoftMaxPro, AutoQuant

## Contacts for further information:

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713.500.7495

# CENTER FOR LABORATORY ANIMAL MEDICINE & CARE

The Center for Laboratory Animal Medicine and Care (CLAMC) is responsible for the health and well-being of laboratory animals used for the institution's biomedical research programs. CLAMC has been awarded full accreditation by AAALAC-International.

Available services:

- Animal ordering from approved and nontraditional vendors (all animal orders are required to be placed by CLAMC)
- Husbandry and veterinary care for all large and small animal species and aquatic species
- CLAMC veterinarians and staff onsite seven days a week
- Consultation with veterinary faculty on protocol writing, animal model development, and procedures/techniques
- Veterinary technical support for all large animal perioperative care
- Well-equipped large animal operating rooms with multi-parameter patient monitors, circulating water heating pads, Bair® Hugger heated air pads, heated surgical tables, gas anesthetic machines, and mechanical ventilators
- Digital radiography for rats and large animals (Note: For mice, contact the Center for Advanced Microscopy.)
- Sterilization services including steam autoclave and ethylene oxide gas sterilization
- Annual evaluation of isoflurane vaporizers in labs can be performed by veterinary technicians
- Rodent surgery and procedure rooms are available in each facility. Mobile isoflurane anesthetic machines are available for an hourly rental fee.
- Classroom and hands-on training on the care and use of laboratory animals (required for faculty, staff, trainees and collaborators working under approved UTHealth animal protocols)
- In house diagnostic laboratory services include CBC, Chemistry and Electrolyte panels, blood gas, urine, and fecal analysis. Additional tests, such as bacterial culture and sensitivity, and Transnetyx genotyping services can be arranged by CLAMC.

## **Contacts for further information:**

[acare@uth.tmc.edu](mailto:acare@uth.tmc.edu)

CLAMC Main business office number and for veterinary assistance: 713.500.7728

CLAMC Diagnostic laboratory services: 713.500.7735 or 7739

CLAMC Surgery technicians: 713.500.7737 or 7738

# CLINICAL & TRANSLATIONAL PROTEOMICS SERVICES

The Clinical and Translational Proteomics Service Center provides state-of-the-art instrumentation and services to the entire UTHealth and surrounding research community. Our center offers both routine services for faculty who cannot afford nor desire the purchase of their own mass spectrometry instrumentation and collaborative research requiring advanced methods. Our Image Oriented Navigation Laser Microdissection Device (ION LMD pro) can produce quality material for a wide variety of DNA, RNA, and protein analyses and enable a wide range of applications ranging from single-cell isolation to large biopsy extractions, even with fluorescence labeled cells or tissue. The center works in a collaborative fashion between faculty, students and staff to customize services to suit individual projects.

The state-of-art instrumentation:

- Thermo Orbitrap Fusion Trbird Mass Spectrometer
- Thermo LTQ Orbitrap XL-ETD mass spectrometer
- Agilent's 6430 Triple Quadrupole LC/ MS
- The Image Oriented Navigation Laser Microdissection Device (ION LMD pro)

## **A full range of the services:**

- Protein identification from 1D gel bands, 2-D spots and other matrices
- Characterization of immunoprecipitated or affinity-purified proteins and protein complexes
- Global protein profiling with quantitative comparisons between samples (Label free, iTRAQ, SILAC etc)
- Enrichment and characterization of post-translationally modified proteins and peptides
- Accurate molecular weight determination, peptide QC
- Targeted Proteomics (SRM) for biomarker discovery as well as quantitation of selected proteins or peptides in a complex mixture
- Biomarker discovery, qualification, verification and validation
- Biopharmaceutical protein QA/QC, stability, impurity, protein or peptide with drug or dye conjugate
- Training and assist at using Image Oriented Navigation Laser Microdissection Device for high sensitive and accurate DNA, RNA, and protein analyses

## **Contacts for further information:**

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# CLINICAL RESEARCH UNIT

Dedicated Clinical Research Units (CRUs) for conduct of clinical studies

The mission of the CCTS CRUs is to facilitate clinical research by providing investigators with specialized facilities, personnel, and advice. Investigators from CCTS institutions (UTHSC-H, M. D. Anderson Cancer Center, and Memorial Hermann Hospital System) can use any of the CCTS CRUs, depending on the location of their patients and the availability of services at the three CRUs. For assistance designing and implementing clinical studies at the UTHSC-H CRU at Memorial Hermann—Texas Medical Center.

The UTHSC-H CRU at Memorial Hermann—Texas Medical Center offers UT researchers an optimal on-campus resource and expanded capabilities for conducting clinical investigations, while serving as an environment for training health professionals in clinical research. The CRU, located on the 3rd floor of the Robertson Pavilion in Memorial Hermann Hospital, is devoted entirely to the implementation and conduction of clinical research.

The CRU team is comprised of 7 clinical research nurses with a variety of clinical backgrounds, 3 experienced study coordinators, 2 lab specialists and 3 administrative members. All of our staff members, most of whom are cross-trained with coordinating and lab experience, work closely together to offer expertise and deliver the best clinical research support to the UT and Memorial Hermann research community.

## **The CRU provides access to specialty core services, such as:**

- 6 outpatient and 4 inpatient rooms;
- Scheduling diagnostic tests and procedures
- Consulting support in early stages of protocol development
- In-patient and out-patient clinic space
- Nursing and/or coordinator services
- Regulatory monitoring
- Lab services including cell reconstitution and Nitrogen storage

## **Contacts for further information:**

MIGUEL ESCOBAR, MD, Director - [Miguel.Escobar@uth.tmc.edu](mailto:Miguel.Escobar@uth.tmc.edu)

JOHN FORINGER, MD, Co-Director - [John.R.Foringer@uth.tmc.edu](mailto:John.R.Foringer@uth.tmc.edu)

KATHY FRANCO, RN, BSN, CCRC, Operations Director

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# COLLABORATION IMAGING SERVICES

The IMM Center for Molecular Imaging is a facility that all researchers at UTHSC who are involved in small animal studies should be acquainted with. The Center is directed by Dr. Eva Sevick and led by 6 engineering and basic science faculty members whose research focus on different aspects of molecular imaging including new instrumentation, design and chemistry of targeted probes, innovative algorithms, and pioneering translation of new imaging technologies into clinical trials. The newly formed Molecular Imaging “collaboration” center utilizes this existing expertise to interact with academic and industry researchers across the nation on small animal imaging projects in areas including cancer, drug discovery, cardiovascular disease, autoimmune disorders, gastrointestinal disorders, nanotechnology, chronic wound care, peripheral vascular disease, and others. Facilities include a Siemens hybrid PET/CT small animal scanner with custom fluorescence tomography capabilities, a Digi-Rad gamma camera, and an array of custom bioluminescence and fluorescence instrumentation that is paired with unique molecules for diagnosis and therapy. Generalized protocols are available to investigators to maximize benefit from the latest developments in molecular imaging.

Researchers interested in collaborative interaction should directly contact Dr. Eva Sevick or Julie Voss ([Julie.Voss@uth.tmc.edu](mailto:Julie.Voss@uth.tmc.edu)) for consideration of IACUC/biosafety/radioactivity approvals and imaging needs, as well as experimental design of small animal imaging that fits the budgets and scientific needs of investigators.

## **Contact for further information:**

EVA SEVICK, Ph.D., Professor, Director

[Eva.Sevick@uth.tmc.edu](mailto:Eva.Sevick@uth.tmc.edu)

713.500.3561

# DNA SEQUENCING AND GENOTYPING CORE LABORATORY

The Genetic Core Laboratory provides consultative expertise, mentoring, and technical support for human genetics studies and access to DNA banking and genetic technologies, including DNA sequencing and microsatellite or SNP genotyping techniques. The DNA Sequencing and Genotyping Core Laboratory Program is composed of following major components:

- Consultative and mentor-based support services that provide individual investigators with guidance in the design, application, and interpretation of their genetic studies
- Sanger DNA sequencing and microsatellite and SNP genotyping services that generate preliminary data supporting translational genetic research studies.
- Infrastructure for banking DNA and other samples from patient populations and laboratory management system for sample tracking.
- ABI3730xl Genetic Analyzer – for Sanger DNA sequencing or microsatellite or SNP genotyping assays.

## **Contact for further information:**

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713.500.6849

# FLOW CYTOMETRY SERVICES

The Flow Cytometry Service Center is located on the sixth floor of the Fayez S. Sarofim Research Building and maintains four instruments, a BD FACSAria II SORP cell sorter (6 laser system), a BD FACS Calibur (2 laser/4 color system), a Coulter FC500 (2 laser/ 5 color system) and a Luminex LX200 multiplex instrument. There are additional workstations available for post-acquisition data analysis.

These specialized instruments allow researchers to evaluate a large number of samples at the cellular level in a short time frame. The Core offers FACS acquisition and analysis, cell sorting, and consultation for experimental design, interpretation and troubleshooting.

The Flow Cytometry Service Unit is committed to the continuing development of biological research and provides training, instrumentation, technical expertise, data analysis and interpretation for many IBC approved studies.

## **Services provided:**

- Assisted and Unassisted data acquisition
- Assisted and Unassisted cell sorting
- Sorting for Single cell deposition (ex. 96 well plate)
- Post-acquisition data analysis (FlowJo, Diva, Kaluza)
- Experimental design assistance including panel design, controls, etc.
- Troubleshooting
- Training to become an unassisted users

All investigators are encouraged to meet with core staff to discuss the experiment prior to scheduling to discuss panel design, appropriate controls, technical limitations, etc.

The FCSC offers training for both new and experienced investigators. Depending on the level of prior knowledge and the intended frequency of use of the equipment, the training plan is tailored to the specifically to the individual's needs.

## **Contact for further information:**

ALICIA BLANCAS, Ph.D., Sr. Research Associate

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713.500.2486



# HUMAN GENETICS LABORATORY

The UTHealth Human Genetics Center Laboratory features platforms spanning low to high throughput capacities that can be tailored to meet your study's individual goals. We have extensive knowledge and experience with genotyping and methylation assays and utilize a suite of liquid handling robotic systems with a fully integrated laboratory information management system (LIMS) for sample tracking. In addition to typical core services, we also provide post laboratory quality control and quality assurance analyses. Our automated workflow and turnkey deliverables enable us to generate high-quality, low-cost data with rapid turnaround times.

## Genotyping

- Whole Genome and Consortium Arrays
  - Illumina Infinium
- Custom Low to Mid-Plex Genotyping
  - Life Technologies TaqMan Allele Discrimination
  - Agena Bioscience MassARRAY and MassCLEAVE

## Methylation

- Illumina Infinium MethylationEPIC Arrays
- Custom Agena Bioscience EpiTYPER Methylation Arrays

## Sample Processing

- DNA extraction
- RNA extraction
- Globin depletion

## Equipment Usage

- Illumina iScan

## Contact for further information:

[HGC\\_Lab@uth.tmc.edu](mailto:HGC_Lab@uth.tmc.edu)

ERIC BOERWINKLE, Ph.D., Dean and Professor – School of Public Health  
ALANNA MORRISON, Ph.D., Director and Professor – Human Genetics Center  
MEGAN L. GROVE, MS, Associate Director – Human Genetics Center  
Laboratory

# HUMAN HEALTH RESEARCH PROTECTION PROGRAM

UTHealth human subjects' protection program includes several components including the Clinical Trials Resource Center and the UTHealth Committee for Protection of Human Subjects.

The mission of the Clinical trials Resource Center is to resources, expertise, and best practices for investigators and research staff to facilitate efficient, compliant and ethical clinical trial conduct and management.

## **The services provided include:**

- Clinical trials registration
- IND and IDE applications
- DSMB coordination
- Clinical Research Education

The Committee for the Protection of Human Subjects (CPHS) is the name of the Institutional Review Board for the University of Texas Health Science Center at Houston. CPHS has four IRB review panels that meet on the first to fourth Friday of each month.

## **Contact for further information:**

[clinicaltrials@uth.tmc.edu](mailto:clinicaltrials@uth.tmc.edu)

# iLAB SOLUTIONS

Many of our shared resources use iLab Solutions as a service request management platform. This system is integrated with both our financial and identity systems at UTHealth. Therefore, you can log in using your UTHealth credentials and it will automatically pull up funding sources linked to your name. In addition, it allows you to easily access shared resources at our sister institutions.

To access the portal please go to: <https://uthealth.corefacilities.org>

## **Contacts for further information:**

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BARBARA LEGATE, Senior Business Systems Analyst  
[Barbara.S.Legate@uth.tmc.edu](mailto:Barbara.S.Legate@uth.tmc.edu)

# MAGNETIC RESONANCE IMAGING

The MRI Center provides state-of-the-art magnetic resonance imaging both in humans and animals. In addition to routine high resolution imaging, the center can perform advanced imaging studies such as diffusion tensor imaging, functional MRI, magnetic resonance spectroscopy imaging. The center personnel can assist the investigator with the MRI protocol that is tailored to the individual needs. In addition, the center also can perform quantitative image analysis. The center provides services to investigators from UTHealth, TMC, Rice University, and University of Houston. The Center for Advanced Microscopy provides state-of-the-art imaging capabilities as well as expertise to those within UTHealth and the Texas Medical Center who have a need for cutting-edge imaging technology. The instruments housed in the Center, as well as the expert individuals who stand ready to provide training, are available to provide access to vital imaging systems for the purpose of molecular, cellular, tissue and whole animal imaging. It is essential to schedule the scans in advance. Walk-ins will not be accommodated. The investigators should have IRB approval for human studies and AWC approval for animal studies. The center personnel can help investigators with the IRB or AWC protocols.

## **Equipment:**

Human and large animals (including nonhuman primates) studies:

- 3T Philips Ingenia scanner
- Multiple RF coils
- SenasVue for fMRI
- Mock scanner for training subjects

Small animal studies:

- 7T Bruker 30 cm horizontal bore scanner
- Multiple RF coils

## **Contact for further information:**

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# MEDICAL SCHOOL HISTOLOGY LABORATORY

The Histopathology Laboratory is a full service clinical and research histology laboratory, located in the Department of Pathology and Laboratory Medicine within the McGovern Medical School. The laboratory offers and provides all clinical and research related histology services to clients in and around Houston, Texas, and throughout the United States.

## **Services include:**

- Routine Histology
- Immunohistochemistry
- Electron Microscopy
- Molecular Diagnostics

## **Contact for further information:**

[utpath@uth.tmc.edu](mailto:utpath@uth.tmc.edu)

# NANO CHEMISTRY SERVICES

Nano Chemistry provides custom DNA synthesis, labeling, and chemical coupling of DNA thioaptamers, DNA X-Aptamers, and nanoparticles. The Director is a chemist with years of experience in synthesizing specialty DNA, including fluorinated, thioated, and dithioated DNA, RNA, and aptamers and X-Aptamers. The center also offers aptamer selection services, including X-Aptamer selection. The center offers a variety of chemical conjugation services to link nanoparticles, dyes, chelators and spacers with thioaptamers. Typical nanoparticle conjugations use liposomes, gold and iron nanoparticles, and mesoporous silicon particles for multi-stage vectors. We also provide large-scale, high-resolution (14 micron) 3D printing services on our new Fortus 450mc and J750 3D printers.

## Services:

- Monothioate DNA & RNA Aptamer Synthesis –
- FPLC Aptamer Purification – purification on reverse phase or anion exchange columns
- 5'-DNA Dyes and Linkers - Cy3, Cy5, NIRdye800, metal chelators, and chemical linkers such as thiol-, carboxy-, and amino-linkers are commonly requested.
- 3'-DNA Dyes, Linkers and Quenchers – a variety of reagents are available
- Chemical Conjugation Service- we also provide services to link proteins to nanoparticles, dyes, etc.
- X-Aptamers – X-Aptamers combine the best features of drugs and aptamers into a single agent.
- Dithioated DNA – Dithioated aptamers made for especially strong binding interactions with their targets.
- Aptamer Selection Service – We can develop aptamers and X-Aptamers that bind to your protein of interest.
- Nanoparticle Production – A variety of nanoparticles can be provided and conjugated.
- Large Scale, High-Resolution 3D Printing of both Production Models and Prototypes.

## Contact for further information:

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# OFFICE OF STRATEGIC INDUSTRY INITIATIVES

The Office of Strategic Industry Initiatives (OSII) was jointly created by the Offices of Technology Management (OTM) and Academic & Research Affairs (OARA) to foster strategic relationships between UTHealth faculty and key life sciences companies in the areas of therapeutics, diagnostics, IT, software, devices, or other areas pertinent to faculty research and to provide a point of contact for collaborative research programs.

## **Examples of activities benefitting UTHealth Faculty researchers include:**

- Providing a point-of-contact to engage relevant industry partners and facilitate discussions, including meeting organization and drafting/negotiating mutual confidentiality agreements
- Facilitating industry-initiated calls for proposals and review for submission
- Engaging with and facilitating UT System-based initiatives, including UT System FreshAIR
- Maintaining a curated database for on-going research capabilities and needs
- Developing larger strategic alliances with companies around areas of strength
- Advertising relevant industry-related funding opportunities (e.g. SBIR/STTR, DARPA, CPRIT commercialization awards, etc.)
- Creating a small company database for faculty interested in collaborating for SBIR/STTR grant application submissions
- Keeping lines of communication with UTHealth administrative offices to provide assistance, when applicable and assist with agreement development
- Coordinating with area resources and initiatives and advertising opportunities where appropriate (e.g. JLABS, TMCx, Houston Technology Center, i-Corps at MDACC, etc.)
- Promote unique core services and facilitating contract execution and management for those services

Website for more information: [www.uth.edu/osii](http://www.uth.edu/osii)

## **Contact for further information:**

MELISSA THOMPSON, Ph.D., Associate Director, Strategic Industry Initiatives  
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713.500.3415

# PRE-CLINICAL COMPUTED TOMOGRAPHY

The eXplore Locus Ultra Pre-Clinical cone-beam CT (GE Healthcare, London, ON) is a unique scanner, one of only a few built, that is a hybrid between clinical and micro-CT systems. A 25 cm bore and 14 cm diameter field of view (10 cm Z-coverage), coupled with relatively high resolution (154 micrometer isotropic voxel size) makes the Ultra an ideal system for the imaging of animals from the size of rats to rabbits and other similar sized animals or specimens. X-rays are produced by a variable voltage X-ray source tube capable of energies from 70 to 140 kVp, filtered by 3.5 mm Al and 0.5 mm Cu. The source tube and charge-coupled flat-panel detector rotate on a gantry with rotation speeds as high as 1 sec, permitting scan times nearly as short as clinical systems.

This imaging modality can facilitate studies among multiple disciplines: orthopedics, pulmonary, cardiovascular, gastrointestinal, genitourinary, oncology, and others.

## **Services - Equipment Available for Reservation:**

- eXplore Locus Ultra Pre-Clinical cone-beam CT (GE Healthcare, London, ON)

## **Contact for further information:**

DELIA DANILA, Ph.D., Assistant Professor and Core Facility Director

[Delia.Danila@uth.tmc.edu](mailto:Delia.Danila@uth.tmc.edu)

713.486.6531



# QUANTITATIVE GENOMICS & MICROARRAY SERVICES

The Quantitative Genomics and Microarray Facility provides investigators access to state-of-the-art detection technologies, automation and expertise for a variety of scientific methodologies. The facility can perform all techniques associated with a qPCR instrument, quantitative Meso Scale ELISAs and microarrays utilizing Illumina, Exiqon, and Agilent arrays.

## Services:

- Arrays: Expression, miRNA, Genotyping and Methylation (Illumina, Exiqon, Agilent)
- Assay types: Transcript Quantification, Gene Quantification, Gene Validation,
- Assay Development
- mRNA Screening
- miRNA Screening and Validation
- HRM Analysis
- Quantitative ELISA
- Other Services: Agilent Bioanalyser, Scanning, Bioinformatics Consultation (Use of Ingenuity Application)

## Contacts for further information:

DAVID LOOSE, Ph.D., Professor & Service Center Director

Lab: MSB 4.153

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TUAN M. TRAN, Facility Manager

[Tuan.M.Tran@uth.tmc.edu](mailto:Tuan.M.Tran@uth.tmc.edu)

713.500.7483

# SAFETY, HEALTH, ENVIRONMENT & RISK MANAGEMENT (SHERM)

Safety, Health, Environment & Risk Management's mission is to work in conjunction with the UTHealth community to ensure that education, research, and health care service activities take place in conditions that are optimally safe and healthy for all students, faculty, staff, visitors, surrounding community and the general public.

## Services:

- SHERM provides a variety of services including dosimetry, safety compliance training, hazardous waste collection, IRB and CLAMC protocol review facilitation, assistance with shipping of potentially hazardous substances.
- SHERM has industrial hygiene monitoring equipment available for researcher to use. This portable monitoring equipment can measure noise, vibration, chemical exposures, aerosol particulates, radiation, etc. Equipment is available per request.
- They maintain two shared irradiator sources for research use providing 1.61 Gy/min and 1.14 Gy/min respectively.
- Additionally they oversee the Occupational Health Clinical services which includes new employee screening, management of employee injuries and exposures, monitoring of community based disease and specialized testing in high risk research areas.

## Contact for further information:

(Main Office) 713.500.8100

For Emergencies always dial 911

# SMALL ANIMAL CARDIOVASCULAR PHENOTYPING CENTER

The Small Animal Cardiovascular Phenotyping Center at McGovern Medical School provides access to state of the art equipment and expertise for mouse and zebrafish cardiovascular physiology.

- State-of-the-art Vevo 3100 echocardiography platform with 3D/4D mode capability and multiple software modules including VevoVasc Ultra, VevoStrain Analysis, and LV Trace.
- Doppler system for high-velocity vascular flow measurements
- Coda tail-cuff volume blood pressure recorder
- ADInstruments PowerLab high-fidelity pressure recorder for use with Millar catheters
- Leica A60 S Stereo Microscope with image capture

## **Contact for further information:**

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# TEXAS ADVANCED COMPUTING CENTER

The Texas Advanced Computing Center at The University of Texas at Austin (TACC) designs and deploys the world's most powerful advanced computing technologies and innovative software solutions to enable researchers to answer complex questions. Every day, researchers rely on TACC's computing experts and resources to help them gain insights and make discoveries that change the world. TACC's mission is to enable discoveries that advance science and society through the application of advanced computing technologies. The center's environment includes a comprehensive cyberinfrastructure ecosystem of leading-edge resources in high performance computing (HPC), visualization, data analysis, storage, archive, cloud, data-driven computing, connectivity, tools, APIs, algorithms, consulting, and software. In addition, TACC's skilled experts work with thousands of researchers on more than 3,000 projects each year.

## **Contact for further information:**

[www.tacc.utexas.edu](http://www.tacc.utexas.edu)

WILLIAM ALLEN, Ph.D.

Life Sciences Computing

[wallen@tacc.utexas.edu](mailto:wallen@tacc.utexas.edu)

# THERAPEUTIC ANTIBODY CORE

The successful clinical use of monoclonal antibodies is one of the most significant advances in cancer treatment today. Antibody-based therapies provide desirable attractive specificity, multiple mechanisms of action, and desirable safety profiles. Humanization, optimization for drug-like properties, and cloning antibody genes for expression in large quantities are labor-intensive processes requiring specialized equipment and expertise that challenge the translation of basic research to the discovery of drug candidates.

The CPRIT (Cancer Prevention Research Institute of Texas) Therapeutic Monoclonal Antibody Lead Optimization and Development Core Facility, which uses the abbreviated title the Therapeutic Antibody Core, aims to provide state-wide support and service to advance lead antibodies from academic laboratories to the stage of preclinical development. Core service is divided into four modules and performed by a team with diverse and complementary knowledge and expertise. The four modules are:

## The four modules are:

- **Lead Identification:** Hybridomas, Phage library panning, Single B-cell cloning
- **Lead optimization:** Antibody gene cloning, Humanization, Affinity
- **Lead construction:** Antibody drug conjugation (ADC), Bi-specific antibody constructs, IgG isotypes and Fc engineering
- **Antibody production:** Hybridoma cell lines, HEK293 transient, CHO stable cell lines

Individual monoclonal antibody services are also available. Please contact us for additional details.

## Contacts for further information:

<https://www.txtac.net>

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NINGYAN ZHANG, Ph.D., Co-Director

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# TRANSGENIC AND STEM CELL SERVICES

The Transgenic and Stem Cells Service Center was established in 1998 and since that time, it has generated over 750 new transgenic, knock-out and knock-in mouse animal models for investigators from UTHHealth, as well as for scientists from numerous other academic institutions. The stem cell lines that have been derived in the laboratory are highly effective for the generation of knock-out / knock-in mice and for cell differentiation studies. These cell lines are routinely used in the Core Facility and are also commercially distributed. In addition to the production, cryopreservation and re-derivation of genetically-engineered mice and rats, the services of the facility also include gene targeting, using ES cells or CRISPR/Cas9, derivation of cell lines and intellectual/technical support in different aspects of microsurgery, cell culture and stem cells research.

## Services:

- Microinjection of DNA, BAC or YAC clones for the production of transgenic mice
- Microinjection of ES cells for the production of knock-out and knock-in mice
- Microinjection of DNA for the production of transgenic rats
- Cryopreservation of fertilized mouse and rat eggs and sperm
- Re-derivation of mice and rats from fertilized eggs
- Availability of pathogen-free animal models from high level barrier facility
- Gene targeting, using ES cells or CRISPR/Cas9, selection. Expansion, cryopreservation of mouse ES cells
- Derivation of novel mouse ES cells and other cell lines
- Availability of germline competent mouse ES cell lines (129/SvImJ, C57BL/6 and BALB/c) and antibiotic -resistant mouse fibroblast feeder layer cells

## Contacts for further information:

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