

Facilities & Research Environment

Texas Medical Center: The University of Texas Health Science Center at Houston (UTHealth) is located within the Texas Medical Center (TMC), the world's largest medical complex, which has the goal of providing the best healthcare and clinical and basic biomedical research possible. The 1,345-acre TMC is home to 59 member institutions, including: 18 hospitals & clinics; components of 7 major universities with 4 schools of medicine, 4 schools of nursing, schools of pharmacy, biomedical Informatics, public health, and biomedical sciences, institutes for spirituality, molecular medicine, and city and county health & human service entities. This concentration of medical professionals provides unprecedented opportunities for collaboration between basic scientists and clinicians. In this environment, we are well positioned to complete the research described in the application and have the rich intellectual environment provided by a critical mass of investigators who have expertise in **cancer biology, immunotherapy, molecular therapeutics, and biomaterials (list specific resources related to your project here)** to mention only a few areas.

The University of Texas Health Science Center at Houston (UTHealth): UTHealth, the most comprehensive academic health center in the UT System and the U.S. Gulf Coast region, is home to schools of biomedical informatics, biomedical sciences, dentistry, medicine, nursing and public health. UTHealth educates more healthcare professionals than any other health-related institutions in the State of Texas. Its medical school is the nation's sixth largest. It includes a psychiatric hospital and growing network of clinics throughout the region. The university's primary teaching hospitals include Memorial Hermann-Texas Medical Center, Children's Memorial Hermann Hospital and Harris Health Lyndon B. Johnson General Hospital. Founded in 1972 by the UT System Board of Regents, UTHealth's 10,000-plus faculties, staffs, students and residents are committed to delivering innovative solutions that advance human health and well-being. UTHealth and the UTMDACC are sister organizations within the University of Texas System, and a number of system-wide agreements enhance and encourage collaborations between investigators including making available many core facilities at internal rates through an inter-institutional agreement of the 7 member Gulf Coast Consortium. This includes the Mass Spec cores at Rice University and at the Baylor College of Medicine (BCM). All of the Advanced Technology Cores at BCM are included in the agreement and are available to our team. In addition, UTHealth and UTMDACC share a graduate school, the fully accredited UTMDACC/UTH Graduate School of Biomedical Sciences (GSBS).

The University of Texas Health Science Center School of Dentistry - The UTHealth School of Dentistry was founded in 1905. Since the foundation, the school has graduated more than 6,000 dentists, 1,850 dental hygienists and nearly 1,500 post-graduate specialists. Currently, the school offers 10 accredited programs: DDS, dental hygiene, two primary care general residency programs and six specialty programs in pediatric dentistry, endodontics, oral and maxillofacial surgery, prosthodontics, periodontics and orthodontics. The school also offers a DDS/PhD in collaboration with the GSBS, and a certificate in oral and maxillofacial surgery for MDs at the UTHealth Medical School. UTSD students gain clinical skills in onsite clinics, at affiliated hospitals and through community outreach projects. The school has affiliations with nine hospitals, 48 Houston Independent School District sites and more than 30 clinics, community agencies and long-term health care centers. The dental school consists of 323,000 square feet in a self-contained six floor building, including a clinical simulation and learning center, lecture rooms, auditorium, television studio, faculty offices, administrative offices, clinical treatment areas and a library. Approximately 105 dental students are admitted to the dental school each year and approximately 40 to the School of Dental Hygiene.

Clinical Research: Clinical research at the School of Dentistry includes a wide variety of activities united by a common goal of improving oral health care delivery through discovery and translation of discovery to the dental patient population. UTSD faculty, residents, postdoctoral fellows, research scientists, dental students and, graduate students from the GSBS, participate in clinical and translational research at the School. The Office of Clinical and Translational Research (OCTR) is charged with developing infrastructure, policies, and workflows to facilitate clinical research at UTSD. An online CANVAS course in clinical research and human subjects and a process for obtaining administrative approval for clinical projects bridging the Offices of Research and Patient Care are in place. The OCTR is working with colleagues in the Schools of Medicine, Nursing, Public Health, and Biomedical Informatics to develop integrated improvements to support clinical research across the spectrum of clinical research activity at UTHealth.

Dental Clinical Research Unit (DCRU): The mission of the DCRU is to facilitate clinical research by providing investigators with dedicated facilities and advice. The DCRU consists of two dedicated operatories, an office for staff, sample storage capacity, and access to the full time Research Coordinator III who provides assistance with IRB development and project management.

UTPhysicians Community Clinic at the School of Dentistry: The clinic opened in summer of 2019 at UTSD. The presence of the Community Clinic allows for development of interdisciplinary research projects that bridge health care delivery across traditional boundaries separating oral and overall care.

Biomedical Research: The research labs for basic science are located in a new building for Behavioral and Behavioral and Biomedical Sciences (BBS) adjoining and connected to the dental school's building. The BBS was designed for molecular biological microbiological and immunological research, with shared isolated rooms designated for bacterial culture, centrifuges, microscopes (inverted and fluorescence), cell culture, RNA extraction, real-time PCR units, 4°C, 37°C and ultracold freezers. The PI has access to all these designated rooms. The PI's laboratory has a non-contiguous modular 1700 square feet total research space and additional shared space for freezers, refrigerators, incubators, and cell cultures. Researchers at BBSB also have access to other specialized cores at UTHSC, including the Houston Center for Biomaterials and Biomimetics (HCBB) in the Dental School building.

Center for Craniofacial Research: The approximately 9,000-square-foot Center was created to host basic scientists and clinicians engaged in research related to craniofacial development and disorders. The Center provides a crucial collegial environment where faculties, postdocs, and graduate students pursuing similar research projects can collaborate, allowing basic scientists to translate knowledge gained in the lab into the clinics. The facility also includes an additional 2,000 square feet of office and "dry lab" space to support researchers assigned to the fourth floor and special projects such as informatics.

Shared Equipment at BBS Building and BCBB: The school provides the following equipment:

- Microscopes: Nikon Eclipse E400, Olympus BX41, Leica MZ95 binocular scope, Nikon Eclipse 80i, and Nikon Eclipse Ti-U, Nikon C2 inverted confocal microscope, Nikon A1R-MP multiphoton confocal microscope, Bitplane Imaris 9.3 imaging & quantification software, Zeiss EVO 10 SEM Scanning Electron Microscope (SEM), Live cell imaging system (Keyence)
- Imagers and Plate Readers: BioTek Cytation 5 Multi-Mode Reader, Li Cor Odyssey Scanning Imager, Tecan Infinite F200 Pro Plate Reader, BioRad Bioplex system, and ELISA plate readers, Versadoc and Konica Minolta Film Developer
- Centrifuges: Eppendorf 5810R Benchtop Centrifuge, Eppendorf 5430R Benchtop Centrifuge for tissue culture, Beckman Coulter Optima L-100 XP Ultracentrifuge, and Beckman Coulter Avanti J-26 Xp Centrifuge
- Incubators: Aerobic incubator for bacterial use, Aerobic incubator and shaker, and Fisher Isotemp CO₂ incubator for tissue culture
- Thermal cyclers: BioRad iCycler and CFX96 RT-PCR)
- Cryostat: Leica CM3050S
- FACS Becton Dickinson FACS Caliber Flow Cytometer Spectrophotometer (Beckman), and Liquid Scintillation Center, and Facilities (4 MQ H₂O water filtration systems, two Autoclaves, Glassware dishwasher
- Rheometer: TA Instruments DHR-3
- 3D Printers: Pegasus Touch FSL3D printer (Full Spectrum Laser); Allevi 1, Aspect Bioprinter
- Flexcell FX-5000 Compression System

UTHealth Core Laboratories: There are multiple core laboratories at UTHSCH and those pertinent to the application are listed below:

- *Image Core Lab:* The facility has 3 confocal microscopes, 2 FLIM imaging platforms, a TIRF system, a confocal high content imaging platform and an IVIS. A multi-photon confocal microscope was installed in early 2017.

- *DNA Sequencing Core*: The sequencing core facility provides both DNA sequencing and Real-time PCR services.
- *Microarray Core Laboratory*: The core facility provides analysis of differential gene expression via expression profiling with commercial high-density oligonucleotide arrays (Agilent or MWG chips). The laboratory also has in-house microarray printing capabilities for custom synthesis of cDNA and oligonucleotide arrays. RNA quality can be determined using an Agilent Bioanalyser. Microarray scanning is available on an Axon 4200A 2-color laser scanner and hybridization on a Tecan HS 4800 automated hybridization station.
- *Antibody Engineering and Expression Service Center*: The Service Center contains four major functional modules: 1) Lead antibody generation; 2) Monoclonal antibody gene cloning and humanization; 3) Antibody affinity maturation; and 4) Cell line development & antibody production.
- *Center for Clinical and Translational Sciences (CCTS)*: The CCTS, supported by one of the first 12 national NIH Roadmap Clinical and Translational Science Awards, provides resources and expertise in study design, biostatistics, regulatory issues, bioinformatics, and additional core laboratory services for immune marker, MRI, proteomic, and genomic assays.

Animal Facility:

The Center for Laboratory Animal Medicine and Care (CLAMC) at UTHealth is responsible for the health and well-being of laboratory animals used for the institution's biomedical research programs. CLAMC works in tandem with the institutional Animal Welfare Committee (AWC), and it meets all standards mandated by the Animal Welfare Act, Center for Disease Control, National Research Council Guide for the Care and Use of Laboratory Animals, Association for Assessment and Accreditation of Laboratory Animal Care - International, and the Public Health Service Policy on Humane Care and Use of Laboratory Animals. Dr. Bradford S. Goodwin, Jr., D.V.M. has 45 staff members to support the health and well-being of laboratory animals used in the university's biomedical research programs. All research personnel involved in research requiring animals must participate in training that emphasizes the well-being of the research animals. All protocols must be reviewed by the AWC at UTHealth. The UTHealth School of Dentistry has a new 18,156-square-foot state-of-the-art vivarium that comprises one floor of the BBSB. This area contains the most up-to-date technology for performing research procedures with vertebrate animals, which includes special building surfaces and materials, a barrier area that protects animals from potential diseases or viral pathogens and a new cage washing facility, including a tunnel washer and a rack washer. The housing system for rodents consists of an individually ventilated caging rack system that brings purified, high-efficiency particulate air (HEPA) to each cage. Cleanliness is a high priority in an animal care center, and the deluxe surgical suite of the vivarium is well prepared to maintain proper hygiene.

Office: Describe your office and location and proximity to the other facilities you will use. The offices are equipped with ergonomic modular furniture, file cabinets, bookshelves, computers, networked printer, telephone, internet access, and secretarial and technical support. On site IT technical support provides necessary computers and software (Office, Photoshop, Acrobat, EndNote, etc.) to analyze data and write manuscripts.

Administrative Support: Administrative staff at the UTSD Research Office is available at all times for financial, administrative and other research-related services. A full time statistician (Dr. J.N. Holland) and full time Genetic Counselor (E. Hansen-Kiss) are available for project support through the Office of Research. (Expand on these as needed for your specific project- what services will they provide to you- biosketches for both are available if you need them for your application)