Texas A&M
Core Research Facilities

Texas A&M Division of Research
Jack K. Williams Administration Building, Suite 312
College Station, Texas 77843-1112
Tel. 979-845-8585
http://vpr.tamu.edu
Texas A&M Core Facilities
Thematic Areas

1. Microscopy and Imaging
   All cores having microscopy and imaging as the primary activity. Examples include electron microscopy, radiological imaging, ultrasound, etc.

2. Integrated Biological and Medical Translational
   All cores whose focus is various aspects of human, animal and plant health, including precision medicine, precision agriculture, and microbiome.

3. Materials and Fabrication
   All cores whose focus is various aspects of materials and manufacturing, including materials characterization, mechanical testing, nanofabrication, and therapeutics.

4. Data Informatics and Computation
   All cores whose focus is various aspects of bioinformatics and computation, including genomics, high throughput screening, molecular simulations and biological informatics.

5. Chemical Science Technologies
   All cores whose focus is various aspects of chemical and molecular analysis, including NMR, mass spectrometry, protein analysis, and isotopes.
<table>
<thead>
<tr>
<th>Name of Core Facility</th>
<th>Director</th>
<th>Thematic Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell Metabolism Core</td>
<td>Fen Wang</td>
<td>Microscopy and Imaging</td>
</tr>
<tr>
<td>Center for Advanced Imaging</td>
<td>Michael Mancini</td>
<td>Microscopy and Imaging</td>
</tr>
<tr>
<td>College of Dentistry Research Core</td>
<td>Shannon Kramer</td>
<td>Microscopy and Imaging</td>
</tr>
<tr>
<td>Image Analysis Laboratory</td>
<td>Robert C. Burghardt</td>
<td>Microscopy and Imaging</td>
</tr>
<tr>
<td>Integrated Microscopy and Imaging Laboratory</td>
<td>Andreea Trache</td>
<td>Microscopy and Imaging</td>
</tr>
<tr>
<td>Microscopy and Imaging Center</td>
<td>Kristen Maitland</td>
<td>Microscopy and Imaging</td>
</tr>
<tr>
<td>Pre-Clinical Imaging Core</td>
<td>Jiang Chang</td>
<td>Microscopy and Imaging</td>
</tr>
<tr>
<td>AgriGenomics Laboratory</td>
<td>David Stelly</td>
<td>Integrated Biological and Medical Translational</td>
</tr>
<tr>
<td>Animal Genetics Laboratory</td>
<td>Rytis Juras</td>
<td>Integrated Biological and Medical Translational</td>
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<td>Antibody &amp; Biopharmaceutics Core</td>
<td>Praveen Rajendran</td>
<td>Integrated Biological and Medical Translational</td>
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<tr>
<td>Center for Precision Ag Technology</td>
<td>Libo Shan</td>
<td>Integrated Biological and Medical Translational</td>
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<tr>
<td>COM Cell Analysis Facility</td>
<td>Robert Alaniz</td>
<td>Integrated Biological and Medical Translational</td>
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<tr>
<td>Comparative Medicine Program</td>
<td>Robert Rose</td>
<td>Integrated Biological and Medical Translational</td>
</tr>
<tr>
<td>Epigenetics Core</td>
<td>Yun (Nancy) Huang</td>
<td>Integrated Biological and Medical Translational</td>
</tr>
<tr>
<td>Flow Cytometry and Cell Sorting Core</td>
<td>Margie Moczygemba</td>
<td>Integrated Biological and Medical Translational</td>
</tr>
<tr>
<td>Flow Cytometry Facility</td>
<td>Gus Wright</td>
<td>Integrated Biological and Medical Translational</td>
</tr>
<tr>
<td>High Throughput Research and Screening Center</td>
<td>Peter Davies</td>
<td>Integrated Biological and Medical Translational</td>
</tr>
<tr>
<td>Human Clinical Research Building</td>
<td>Richard Kreider</td>
<td>Integrated Biological and Medical Translational</td>
</tr>
<tr>
<td>Integrated Metabolites Analysis Core (IMAC)</td>
<td>Larry Dangott, Arul Jayaraman</td>
<td>Integrated Biological and Medical Translational</td>
</tr>
<tr>
<td>Laboratory for Synthetic-Biologic Interactions</td>
<td>Karen Wooley</td>
<td>Integrated Biological and Medical Translational</td>
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<tr>
<td>Molecular Cytogenetics Laboratory</td>
<td>Terje Raudsepp</td>
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<tr>
<td>Molecular Genomics Core</td>
<td>Andrew Hillhouse</td>
<td>Integrated Biological and Medical Translational</td>
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<tr>
<td>Multi-Crop Transformation Facility</td>
<td>Marco Molina</td>
<td>Integrated Biological and Medical Translational</td>
</tr>
<tr>
<td>Protein Production Core</td>
<td>Magnus Hook, Wen Liu</td>
<td>Integrated Biological and Medical Translational</td>
</tr>
<tr>
<td>Rodent Preclinical Phenotyping Core</td>
<td>Alexandra Trott</td>
<td>Integrated Biological and Medical Translational</td>
</tr>
<tr>
<td>Systems and Synthetic Biology Innovations Hub</td>
<td>Joshua S. Yuan</td>
<td>Integrated Biological and Medical Translational</td>
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<tr>
<td>Texas A&amp;M Institute for Genomic Medicine</td>
<td>Ben Morpurgo</td>
<td>Integrated Biological and Medical Translational</td>
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<tr>
<td>AggieFab Nanofabrication Facility</td>
<td>Arum Han</td>
<td>Materials and Fabrication</td>
</tr>
<tr>
<td>Biomedical Engineering Shared Laboratories</td>
<td>Amanda Myatt</td>
<td>Materials and Fabrication</td>
</tr>
<tr>
<td>IODP Core Scanning Laboratory</td>
<td>Brian LeVay</td>
<td>Materials and Fabrication</td>
</tr>
<tr>
<td>Materials Characterization Facility</td>
<td>Miladin Radovic</td>
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</tr>
<tr>
<td>Materials Development and Characterization Center</td>
<td>Ibrahim Karaman</td>
<td>Materials and Fabrication</td>
</tr>
<tr>
<td>National Center for Therapeutics Manufacturing</td>
<td>Zivko Nikolov</td>
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</tr>
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<td>National Corrosion and Materials Reliability Laboratory</td>
<td>Raymundo Case</td>
<td>Materials and Fabrication</td>
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<td>Name of Core Facility</td>
<td>Director</td>
<td>Thematic Area</td>
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<tr>
<td>Soft Matter Facility</td>
<td>Svetlana Sukhishvili</td>
<td>Materials and Fabrication</td>
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<tr>
<td>SQUID Magnetometer</td>
<td>Nattamai Bhuvanesh</td>
<td>Materials and Fabrication</td>
</tr>
<tr>
<td>X-Ray Diffraction Laboratory</td>
<td>Francois Gabbai</td>
<td>Materials and Fabrication</td>
</tr>
<tr>
<td>Crop Genome Editing Laboratory</td>
<td>Michael Thomson</td>
<td>Data Informatics and Computation</td>
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<tr>
<td>Genomics and Bioinformatics Service</td>
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<tr>
<td>Laboratory for Molecular Simulation</td>
<td>Michael B. Hall</td>
<td>Data Informatics and Computation</td>
</tr>
<tr>
<td>Rigor &amp; Reproducibility Core</td>
<td>Kurt Zhang</td>
<td>Data Informatics and Computation</td>
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<tr>
<td>Smart Grid Control Room Lab</td>
<td>Tom Overbye</td>
<td>Data Informatics and Computation</td>
</tr>
<tr>
<td>TIGSS Bioinformatics Core</td>
<td>Kranti Konganti</td>
<td>Data Informatics and Computation</td>
</tr>
<tr>
<td>Center for Atmospheric Chemistry and the Environment</td>
<td>Sarah Brooks</td>
<td>Chemical Science Technologies</td>
</tr>
<tr>
<td>Center for Mass Spectrometry</td>
<td>Klaudia Kocurek</td>
<td>Chemical Science Technologies</td>
</tr>
<tr>
<td>Chemistry Mass Spectrometry Facility</td>
<td>Bo Wang</td>
<td>Chemical Science Technologies</td>
</tr>
<tr>
<td>Collaborative Resource in Biomolecular NMR</td>
<td>Joshua Wand</td>
<td>Chemical Science Technologies</td>
</tr>
<tr>
<td>Elemental Analysis Laboratory</td>
<td>Bryan E. Tomlin</td>
<td>Chemical Science Technologies</td>
</tr>
<tr>
<td>Geochemical and Environmental Research Group</td>
<td>Anthony Knap</td>
<td>Chemical Science Technologies</td>
</tr>
<tr>
<td>ILSB Mass Spectrometry Lab (ILSB-MSL)</td>
<td>David H. Russell</td>
<td>Chemical Science Technologies</td>
</tr>
<tr>
<td>NMR/ESR Facility of the Chemistry Department</td>
<td>Janet Bluemel</td>
<td>Chemical Science Technologies</td>
</tr>
<tr>
<td>Nuclear Science Center</td>
<td>Sean McDeavitt</td>
<td>Chemical Science Technologies</td>
</tr>
<tr>
<td>Protein Chemistry Laboratory</td>
<td>Lawrence Dangott</td>
<td>Chemical Science Technologies</td>
</tr>
<tr>
<td>Radiation Effects Facility</td>
<td>Henry Clark</td>
<td>Chemical Science Technologies</td>
</tr>
<tr>
<td>Stable Isotope Geosciences Facility</td>
<td>Brendan Roark</td>
<td>Chemical Science Technologies</td>
</tr>
<tr>
<td>Stable Isotopes for Biosphere Science Laboratory</td>
<td>Tom Boutton/Jason West</td>
<td>Chemical Science Technologies</td>
</tr>
<tr>
<td>Facility</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>AggieFab Nanofabrication Facility</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>AgriGenomics Laboratory</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Animal Genetics Laboratory</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Antibody &amp; Biopharmaceutics Core</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Biomedical Engineering Shared Laboratories</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Cell Metabolism Core</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Center for Advanced Imaging</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Center for Atmospheric Chemistry and the Environment</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>Center for Precision Ag Technology</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Collaborative Resource in Biomolecular NMR</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>College of Dentistry Research Core</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>COM Cell Analysis Facility</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Comparative Medicine Program</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Crop Genome Editing Laboratory</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Elemental Analysis Laboratory</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Epigenetics Core</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>Flow Cytometry and Cell Sorting Core</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Flow Cytometry Facility</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Genomics and Bioinformatics Service</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Geochemical and Environmental Research Group</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>High Throughput Research and Screening Center</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Human Clinical Research Building</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>ILSB Mass Spectrometry Lab (ILSB-MSL)</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Image Analysis Laboratory</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Integrated Metabolics Analysis Core (IMAC)</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Integrated Microscopy and Imaging Laboratory</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>IODP Core Scanning Laboratory</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Laboratory for Molecular Simulation</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Laboratory for Synthetic-Biologic Interactions</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Materials Characterization Facility</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>Microscopy and Imaging Center</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Molecular Cytogenetics Laboratory</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Molecular Genomics Core</td>
<td>13</td>
<td></td>
</tr>
<tr>
<td>Multi-Crop Transformation Facility</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>National Center for Therapeutics Manufacturing</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td>National Corrosion and Materials Reliability Laboratory</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>NMR/ESR Facility of the Chemistry Department</td>
<td>27</td>
<td></td>
</tr>
<tr>
<td>Pre-Clinical Imaging Core</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
## Index of Core Facility Slides

<table>
<thead>
<tr>
<th>Facility</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein Chemistry Laboratory</td>
<td>27</td>
</tr>
<tr>
<td>Protein Production Core</td>
<td>14</td>
</tr>
<tr>
<td>Radiation Effects Facility</td>
<td>28</td>
</tr>
<tr>
<td>Rigor &amp; Reproducibility Core</td>
<td>22</td>
</tr>
<tr>
<td>Rodent Preclinical Phenotyping Core</td>
<td>15</td>
</tr>
<tr>
<td>Smart Grid Control Room Lab</td>
<td>23</td>
</tr>
<tr>
<td>Soft Matter Facility</td>
<td>19</td>
</tr>
<tr>
<td>Stable Isotope Geosciences Facility</td>
<td>28</td>
</tr>
<tr>
<td>Stable Isotopes for Biosphere Science Laboratory</td>
<td>29</td>
</tr>
<tr>
<td>Texas A&amp;M Institute for Genomic Medicine</td>
<td>15</td>
</tr>
<tr>
<td>TIGSS Bioinformatics Core</td>
<td>23</td>
</tr>
<tr>
<td>X-Ray Diffraction Laboratory</td>
<td>20</td>
</tr>
</tbody>
</table>
Texas A&M Core Facilities

Thematic Areas

- Microscopy and Imaging
  - Integrated Biological and Medical Translational
  - Materials and Fabrication
  - Data Informatics and Computation
  - Chemical Science Technologies
Microscopy and Imaging

The mission of the Core is to provide researchers with the access and expertise on real-time measuring glycolysis, oxidative phosphorylation, ATP production profiles, and mitochondria function. The Core will also share expertise on how cell signaling regulates cell metabolism and how abnormal cell signaling hijacks cell metabolism machinery and creates a disease-favoring tissue microenvironment.

Major Equipment
• Seahorse XFe96 Analyzer.

LOCATION
Institute of Biosciences and Technology
Houston

DIRECTOR
Fen Wang, PhD
wangfen@tamu.edu
713-677-7520
https://ibt.tamhsc.edu/faculty/wang-bio.html
Center for Advanced Imaging

The joint IBT:BCM Center for Advanced Imaging provides advanced imaging technologies to support PI’s from IBT, Baylor, and other GCC institutions, supported in part by a joint IBT:BCM CPRIT CFSA resource grant. Imaging and analysis support, including training, is available for leading-edge basic science R&D, assay development to accelerate drug discovery, and HT screening in live or fixed cells via fully-automated multiplex confocal microscopy, spectral genomics, single cell analytics, machine learning, etc.

**Location**
Institute of Biosciences and Technology
Houston
https://ibt.tamhsc.edu/research/ctcr/mancini/index.html

**Director**
Michael A. Mancini, PhD
michaelamancini@tamu.edu
713-408-0179

**Co-Director**
Leoncio Vergara, MD
leovergara@tamu.edu
409-750-2153

**Major Equipment**
- Leica SP8 spectral confocal with white light laser, Falcon deconvolution, STED super-resolution**, FCS, FLIM, live or fixed;
- Nikon CSU-W1 dual spinning disk, multi-laser/multichannel confocal with optogenetics, photobleaching, live or fixed;
- Nikon A1si spectral confocal, with TIRF and Ca++ upgrades, live cell incubator;
- GE-Healthcare DeltaVision deconvolution microscope with hi-res, hi-speed CCDs for routine live/fixed cell;
- IN Cell Analyzer 6000 on-chip HT confocal imaging platform for assay development and automated fixed cell imaging;
- Molecular Devices spinning disk HT confocal microscope and robotics for assay development and live/fixed cell imaging;
- Pipeline Pilot and Open Source software platforms (R, Python: 2D/3D segmentation, data analysis and interpretation, machine learning, neural net, etc;
- StellarVision Synthetic Aperture Optics low-mag, high-res, multi-channel HT microscope designed for multiplexing and spectral genomics;
- **additional super-res resources are available for SIM and STORM

College of Dentistry Research Core

The goal of the COD Research Core is to facilitate the investigation of craniofacial and tooth development, pain, signal transduction, proteins involved in the formation, development, and function of dentin, enamel and bone, and encourage development of multi-institutional collaboration utilizing animal models, histology, and microscopy.

**LOCATION**
College of Dentistry
Dallas, Texas

**DIRECTOR**
Shannon Kramer, MS, PhD
skramer@tamu.edu
214-828-8344
https://dentistry.tamhsc.edu/research/index.htm

**Major Equipment**
- Leica SP5 confocal system with four lasers and five detectors used with an upright scope. Laser lines 405, 458, 488, 514, 543, 561, 633.
- JEOL-6010LA SEM which uses a field emission gun with cold cathode. The resolution is 1.5 nm in SEI and 3.0 nm in BEI. Sample diameter: 32-150 nm.
- ScanCo Micro-CT 35 Scanner
- Leica CTR 6500 Laser Capture Microdissection Microscope
- Other available microscopes: Slide Scanning Olympus VS 120-S5, Nikon epifluorescent microscope, Zeiss Axioplan microscope, and Leica DMRXE microscope
- Animal resource unit.
- Full service histology lab.
The Image Analysis Laboratory (IAL) supports microscopy needs of basic and clinical scientists and their trainees to perform research that improves the health of animals, humans and the environment as part of the One Health Initiative of the Texas A&M University System. The IAL engages in interdisciplinary collaboration with multiple colleges and interdisciplinary programs, and serves as an Advanced Imaging Facility Core for Texas A&M Center for Environmental Health Research, an interdisciplinary NIEHS-supported Center.

Major Equipment
• Zeiss LSM 780 Airy Scan – 4 channel spectral confocal/multiphoton microscope with definite focus and live cell incubator
• Zeiss Elyra super-resolution microscope with 3-Ch, definite focus and live cell incubator
• Cell Discoverer 7 (CD7) – high throughput deconvolution microscope with robotic arm, high-res/speed CCDs and live cell incubator.
• Arvis Vision 4D, Arvis InView R - data visualization, analysis, segmentation and interpretation of 3D & 4D datasets
• Zeiss Imager M.2 motorized upright microscope – fluorescence, DIC, phase optics, Apotome-optical sectioning and deconvolution
• FEI Morgagni transmission electron microscope

Integrated Microscopy and Imaging Laboratory

The primary purpose of the IMIL is to support research innovation and grant development by encouraging researchers to explore advanced imaging modalities and to incorporate them into their existing research programs.

The IMIL includes six microscopy rooms, supporting facilities, and an image processing station.

Core Equipment
• Olympus Fluoview FV3000 Confocal Laser Scanning Microscope - Resonant and galvo scanner, four high-sensitivity GaAsP detectors, automated stage for time-lapse and mosaic imaging, stage-top incubator
• Olympus VS120 Virtual Slide Scanning System -100 slide capacity, automated sample identification and focus, Brightfield and Epi-fluorescence
• NanoFluxor® - Ultra-fast spinning disk confocal with piezo Z-control (up to 100 fps), Spinning Disk Confocal microscope, TIRF microscope
• Atomic Force Microscope for live cells
• Leica SP8 Confocal Laser Scanning Microscope - AOBES spectral confocal scanning head, three PMT detectors
• Coming soon! Olympus FVMPE-RS Multiphoton Laser Scanning Microscope - Gantry frame optimized for intravital imaging, dual wavelength MP Spectra Physics lasers, two high-sensitivity GaAsP detectors, resonant and galvo scanner
Microscopy and Imaging Center

The mission of the MIC is to provide current and emerging technologies for teaching and research involving microscopy and imaging in Life and Physical Sciences. The Center offers expertise in sample preparation, in situ elemental/molecular analyses, high-resolution imaging using light- and electron-enabled microscopy, as well as digital image analysis and processing.

Major Equipment

Light Microscopy
- Leica SP8 Confocal, STED, FLIM system for live cell imaging with high-speed, multi-spectral, super-sensitivity, super-resolution and fluorescence lifetime capability located in a BSL2 room with cell culture equipment.
- Olympus FY1000 Confocal for optical sectioning and 3D imaging of fluorescently labelled BSL1 or fixed samples.
- Zeiss Z.1 Light Sheet for illuminating samples with a focused sheet of laser light to image an entire plane, minimize photobleaching, and maximize acquisition speed.

Electron Microscopy
- Quanta 600 SEM field emission SEM for high-resolution and low-vacuum images.
- Tescan Vega3 SEM with variable pressure mode and Oxford EDS detector
- FEI Tecnai G2 F20 ST TEM Materials for morphological, crystallographic, and elemental analysis of bulk and nanoscale materials
- FEI Tecnai G2 F20 T FE-TEM Cryo with Z contrast dark-field STEM imaging using HAADF detector, Oxford EDS detector, and EELS for elemental mapping
- JEOL 1200 TEM for biological samples with double condenser projection lens and bright/dark field imaging
- JEOL 2010 TEM with high resolution for materials research and INCA Semi-STEM mode for elemental mapping
- Other Supporting Equipment including sputter coaters, plasma cleaners, high pressure freeze, plunge freeze, etc.

Pre-Clinical Imaging Core

The purpose of the Pre-Clinical Imaging Core is to provide a platform to support investigators using state-of-the-art dynamic molecular and anatomical imaging technology to accelerate a broad spectrum of basic and pre-clinical studies via non-invasive, live and in vivo fluorescence, bioluminescence and micro-ultrasound imaging system.

Major Equipment:

- PerkinElmer IVIS Spectrum In Vivo Imaging System – integrated with 2D optical and 3D optical tomography in one platform, ideal for longitudinal monitoring of disease progression, tumor tracking, cell trafficking and gene expression patterns in living animals.
- Fujifilm-Visual Sonics Vevo 3100 – powerful combination of high frame rates and advanced image processing system, ideal for pre-clinical imaging including disease development, tumorigenesis progression, angiogenesis, hemodynamic changes, animal model phenotype characterization.
Integrated Biological and Medical Translational AgriGenomics Laboratory (AGL)

DIRECTOR
David Stelly, PhD
stelly@tamu.edu
979.845.2745

GOALS: To help graduate students, staff and lab-less faculty launch, economize and expedite their research, especially when it involves DNA extraction and quality checks, targeted genotyping and DNA content analysis.

ANNUAL MEMBERSHIPS by PIs provides fiscal year access to AGL training, expertise and equipment for each member’s research team.

SERVICE: While most activities are completed by users, services can be purchased when needed. Non-institutional users can only purchase services.

Major Equipment
- Tissue homogenizers (tube and plate)
- Cooled centrifuge (plate compatible)
- Low-volume 1-channel fluorometer (DNA and RNA extract analysis
- Plate sealers
- Plate replicator (i-Pipette – 96/384-well formats)
- Thermocyclers (96- and 384-well)
- Hydrocycler – giant multi-plate PCR machine
- Pherasar Plus – end-point plate reader and KlusterKaller software
- Accuri C6 tabletop flow cytometer

LOCATION
Building 0954 (rear), i.e., Agronomy Field Laboratory (AGFL), Agronomy Rd., TAMU campus

MANAGER
Robert Vaughn, PhD
agl@tamu.edu
979.458.6594

WEBPAGE: http://agl.tamu.edu/
**Animal Genetics Laboratory**

The Animal Genetics Laboratory offers DNA genotyping used for identification, parentage verification and determination of specific homozygous/heterozygous gene mutations in animals. The analysis provides useful information for diseases, coat colors, as well as physical traits. Currently, the lab provides routine services for testing horses, donkeys and cattle. We also offer ancestry testing for horses.

**LOCATION**
Texas A&M University, CVM, ViBS
Veterinary Medical Research Bldg (1197)

**DIRECTOR**
Rytis Juras, DVM, PhD
rjuras@cvm.tamu.edu
979-845-6524
https://vetmed.tamu.edu/animalgenetics/

**Antibody and Biopharmaceutics Core**

The Antibody and Biopharmaceutics Core (ABC) can generate customized polyclonal and monoclonal antibodies tailored to meet the specific needs of individual research programs. The core also provides tailored engineering of monoclonal antibodies with specialization in affinity maturation and humanization. As part of the Texas A&M Center for Epigenetics and Disease Prevention, ABC has unique expertise generating antibodies against epigenetic targets.

**LOCATION**
Institute of Biosciences and Technology
Houston

**DIRECTOR**
Praveen Rajendran, PhD
prajendran@tamu.edu
713-677-7803
https://ibt.tamhsc.edu/cores/abcore/index.html

**Major Equipment:**
- Biomek FX automated liquid handling workstation
- Molecular Devices ClonePix 2 system
- ForteBio Octet system

**Services:**
- Rapid selection & optimization of hybridoma cell lines
- Affinity determination, maturation and humanization
- Optimized antibody engineering
- Screening for stability, activity and in vivo efficacy
Center for Precision Ag Technology

The goal of the joint IPGB service facilities centered on Precision Ag Technology is to develop a framework to support multi-investigator, multi-institutional grants using advanced agricultural biotechnology to accelerate novel ag trait discovery and design through leading edge R&D and screening via high throughput sensitized monitoring plant physiology traits, genetic lesion detections, and in vitro plant regeneration and transformation pipelines.

Major Equipment and service
- Green house, chambers and plant sample preparation facility.
- High quality plant and pathogen genomic DNA preparation, Sanger sequencing and genotyping services.
- Plant tissue culture, regeneration and transformation facility.
- High throughput plant physiology trait monitoring and screening; monitoring leaf surface temperature, photosynthesis rate, water vapor rate and stress hormone production.

LOCATION
Institute For Plant Genomics and Biotechnology (IPGB), Norman E. Borlaug Center, 498 Olsen Blvd., College Station, TX

DIRECTOR
Libo Shan
Managing Directors
Eun-Gyu No
979-456-1410
https://ipgb.tamu.edu/services/

COM Cell Analysis Facility

The Cell Analysis Facility at the TAMHSC provides cell analysis and cell sorting services for research in the TAMHSC and TAMU community. Equipped for full user experimental workflow from animal/tissue to cells to immunophenotyping and high purity cell sorting to downstream functional analysis.

MAJOR EQUIPMENT
- Becton-Dickinson FACSAria III – Sorter/Cytometer. Lasers: Violet (405nm), Blue (488nm), Yellow-Green (561nm), Red (640nm); 13-parameter single cell analysis; 4-way bulk high speed sorting; Single-cell sorting into 96- or 384-well plates or onto slides; Risk Group 2 compliant (end of Nov 2019).
- Becton-Dickinson Fortessa X-20 – Cytometer. Lasers: Violet (405nm), Blue (488nm), Yellow-Green (561nm), Red (640nm); 16-parameter single cell analysis; Risk Group 2 compliant (end of Nov 2019).
- Agilent Seahorse XFe96 - Cellular Metabolism Analyzer. Measure cellular metabolism and metabolic pathways in real-time (OxPhos, glycolysis, FAO, ATP production, etc.) in a 96-well format; Screen compounds for effects on metabolism; used in cancer biology, immunology and cell biology.
- Miltenyi gentleMACS Octo-Dissociator. Semi-automated dissociation of multi-species tissues into single-cell suspensions or homogenates for downstream culture or cellular & molecular analysis; high viability and recovery; process 16 tissues in 30-45 minutes. Optimized tissue-specific kits and preset programs.

LOCATION
Medical Education & Research Building #2, Room 3226
TAMHSC
Bryan-Hwy 47 Campus

DIRECTOR
Robert C. Alaniz, PhD
robert_alaniz@tamu.edu
979-436-0844
https://research.tamhsc.edu/caf/
Comparative Medicine Program

The Comparative Medicine Program (CMP) is the centrally administered support service for animal research and teaching programs at Texas A&M University, College Station. The program’s facilities and services are available for all Texas A&M campus affiliated faculty, staff, and students who have been approved to conduct animal research by the Institutional Animal Care and Use Committee (IACUC). CMP is accredited by the Association for the Assessment and Accreditation of Laboratory Animal Care (AAALAC) through its affiliation with other AAALAC-accredited Texas A&M programs.

- CMP facilities offer housing and care for most standard laboratory animals. Specialized housing can be provided for biohazard projects and hazardous chemical projects. Varying degrees of animal isolation are available.
- Other services include technical training of research staff, technical support, rental of anesthesia equipment and use of the CMP surgical facility.

LOCATION
CMP administrative offices are at
LARR Main, building 972, Agronomy Road, College Station

DIRECTOR
Robert Rose, DVM, MS, DACLAM
rose@tamu.edu
979-845-7433
https://vpr.tamu.edu/directory/comparative-medicine-program

Epigenetics Core

The Epigenetics Core provides support for a range of epigenetics/epigenomics investigations, including high-throughput sequencing and bioinformatics expertise for RNA-seq, ChIP-seq, DNA methylation and hydroxymethylation profiling, and high-order chromatin organization studies. The Epigenetics core also is equipped with 10X Genomics single cell analyzer capabilities for single-cell transcriptomics, ATAC-seq analysis, and immune profiling.

LOCATION
Institute of Biosciences and Technology
Houston

DIRECTOR
Yun Huang, PhD
yun.huang@tamu.edu
713-677-7484
Deqiang Sun, PhD
dsun@tamu.edu
713-677-7439

Major Equipment:
- Nextseq 550 – Illumina next-generation sequencer
- 10X Chromium Controller – Single cell analyzer
- Covaris M220 – Focused-ultrasonicator
- Bioanalyzer – Automated electrophoresis
- Qubit Fluorometer – Quickly quantitate DNA/RNA
- Computers – 300 CPUs up to 3.7Ghz and 1000GB RAM 4GPU
- Data storage – 328 TB Failure tolerant disk array
- Webserver – 108 TB, daily remotely backup
Flow Cytometry and Cell Sorting Core

The goal of our core is to provide state-of-the-art instrumentation, exceptional specialized expertise and training in flow cytometry. Services include fluorescence-activated cell sorting (FACS), flow cytometry analysis, consultation, data analysis and training. We are also expanding our services to include a CPRIT-funded high-throughput flow cytometry core that supports immuno-oncology drug screening applications.

Major Equipment:
- **BD FACSAria Fusion** - A fully integrated advanced cell sorter and analyzer with a biosafety solution. 4 solid state lasers: 488-nm blue laser (50mW), 640-nm red laser (100mW), 405-nm violet laser (85mW), and a 561-nm yellow-green laser (50mW). Detects 15 simultaneous fluorescent colors.
- **BD LSR II** - Special Order Laser Upgrade includes the installation of a 561-150mw laser system, 637-150nm laser w/mount, Octagon with 3 premounted detectors and 3 high performance filters/mirrors set (3 Bandpass & 3 Dichroic Mirrors) for 561nm laser system on BD LSR II.
- **iQue Screener Plus** – COMING SOON! An automated 3-laser flow cytometer that supports the analysis of 96- or 384-well plate-based multiplexing assays with fast sampling times (<20 min sampling time per 384-well plate) and miniaturized sampling volumes (1 – 5 ul). Uses Forecyte 6 analysis software for analyzing large content data.

LOCATION
Institute of Biosciences and Technology
Houston

DIRECTOR
Margie Moczygemba, PhD
mmoczygemba@tamu.edu
713-677-8114
https://ibt.tamhsc.edu/cores/flow/index.html

Flow Cytometry Facility

The mission of the Flow Cytometry Shared Resource Facility at Texas A&M is to provide the highest quality flow cytometry data, data analysis, and cell sorting services to support the research goals of the faculty, students and staff of the Texas A&M University system and surrounding biotech companies.

Major Equipment
- **Beckman Coulter MoFlo Astrios high-speed cell sorter** - 3-laser, 11 detector cell sorter that can sort up to 6 different populations simultaneously. Housed in a Class 2 B BSC for BSL2 sorting
- **Becton Dickinson Accuri C6 flow cytometer** - 2-laser, 4 detector flow cytometer.
- **Becton Dickinson FACSCalibur flow cytometer** - 1-laser, 3 detector flow cytometer.
- **FlowJo Workstation** - flow cytometry data analysis and visualization software package.

LOCATION
Texas A&M University College of Veterinary Medicine and Biomedical Sciences. VMR Addition Room 257

DIRECTOR
Gus A. Wright, PhD
gwright@cvm.tamu.edu
979-458-9859
https://vtpb.tamu.edu/flow-cytometry/
High Throughput Research and Screening Center

A unique resource providing researchers from Texas A&M and the Texas Medical Center institutions with access to state-of-the-art tools to support academic drug discovery research. The Core provides industry-standard high throughput screening and imaging capabilities and access to collections of nearly 60,000 FDA-approved drugs, investigational agents and chemical compounds. The Core also has assembled libraries of mechanistically annotated compounds to support mechanistic pathway and target-identification studies. The Core is managed by a full-time professional staff of experienced cell biologists, biochemists, pharmacologists and bio-informaticians with pharmaceutical industry and academic experience.

Major Equipment:
- Labcyte Echo 550 liquid-handling workstation - acoustic dispenser integrated with a Cytomat incubator
- Tecan Evo 200 liquid-handling workstation - integrated with Tecan multimode readers and Liconic incubators
- Beckman-Coulter Biomek FXP and Beckman NX P liquid-handling workstations - 96-channel and variable spanning 8-channel pipettor integrated with cell culture incubators and consumables storage system
- Tecan Hydrospeed microplate washer and Multidrop Combi system with stackers
- BioTek Synergy Neo2 Multimode microplate reader with plates loader
- GE Healthcare IN Cell Analyzer 6000 high-throughput 4-channel confocal imaging system with an integrated plate handler.
- Molecular Devices ImageXpress Micro-confocal microscope with an integrated Cytomat incubator for continuous live cell imaging 24hrs a day.

LOCATION
Institute of Biosciences and Technology
Houston

Human Clinical Research Building

The HCRB is a biomedical research facility that was developed to provide a centralized research facility for clinical researchers to conduct human clinical research trials at Texas A&M University.

The HCRB contains the following equipment and facilities:
- exercise training and rehabilitation facilities;
- a large conference / lecture area;
- Faculty & staff offices and research assistant desks;
- 12 beds for overnight stay research studies;
- a metabolic kitchen for feeding studies;
- 4 procedure and research examination rooms;
- DEXA body composition/bone density analyzer;
- Resting energy expenditure rooms;
- Large physiological testing area (ECG/cardiopulmonary exercise testing, isokinetic testing, isotonic testing, etc.);
- a secured data archive system;
- nursing station;
- blood/tissue processing and testing laboratory;
- biobank with monitored and controlled -80°C;
- a comprehensive wet lab facility with 4 LC-MS/MS, 2 GC-MS/MS systems, cell culture, routine clinical chemistry applications, etc.; and,
- a pharmacy compounding room for preparing sterile IV solutions.

Faculty members can reserve access for examination space or have HCRB staff collect data for their independent research on a fee for service basis through iLab or collaborate directly with PI’s housed in the HCRF on grants.
Integrated Metabolomics Analysis Core

The IMAC core facility supports metabolomics research by providing state-of-the-art instrumentation, systems, software, technical expertise and training for the application of modern molecular biological and chemical technologies. With users across 7 colleges the IMAC enables a broad range of liquid and gas chromatography mass spectrometry based research on campus with a significant impact on the scientific community at large with select external clients.

Major Equipment
- Thermo Ultimate 3000 / Q Exactive Plus – Liquid chromatography high resolution accurate mass spectrometry system for untargeted analysis
- Thermo Vanquish / Altis – UHPLC-QQQ MS system for targeted analysis
- Thermo Ultimate 3000 / Quantiva - LC-QQQ MS system for targeted analysis
- Thermo Trace 1310 / TSQ Evo – Gas chromatography – QQQ MS system for targeted analysis

LOCATION
Biochemistry / Biophysics
College Station

CO-DIRECTORS
Arul Jayaraman, PhD
arul@tamu.edu
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Larry Dangott, PhD
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979-845-2965
https://tamu.corefacilities.org/service_center/show_externaly/4628

Laboratory for Synthetic-Biologic Interactions

The Laboratory for Synthetic-Biologic Interactions (LSBI) is dedicated to supporting research in the study of interactions between synthetic materials and biological systems to facilitate the application of advanced materials within biological environments. The facility provides expertise, BL-2 workspace, and advanced instrumentation for biological testing and development of medical devices and nano-pharmaceuticals.

Major Equipment
- Olympus FV1000 & Picooquant TCSPC- Full-spectral confocal with lifetime fluorescence and lifetime-fluorescence anisotropy capabilities.
- Malvern Zetasizer Nano ZS – dynamic light scattering (DLS) with zeta potential and static-light scattering capabilities.
- Mettler Toledo DMA 1 – dynamic mechanical analysis with temperature range from -190 to 600 °C.
- Bruker In Vivo Xtreme – animal imaging cabinet with modalities for x-ray, fluorescence, and bioluminescence.
- Shimadzu IR Prestige – Fourier transform infrared (FTIR) with camera
- B&W Tek i-Raman – Raman spectrometer microscope and probe.

LOCATION
Department of Chemistry
College Station

DIRECTOR
Karen L. Wooley, PhD
wooley@chem.tamu.edu
979-845-4077
https://lsbi.chem.tamu.edu/
**Molecular Cytogenetics Laboratory**

The Molecular Cytogenetics lab offers traditional karyotyping and molecular cytogenetic analysis for a broad range of vertebrate species to: i) identify chromosome rearrangements underlying congenital disorders, subfertility, and disorders of sexual development; ii) evaluate chromosomal stability of cell lines; iii) identify species, or iv) contribute to collaborative projects.

**LOCATION**
Texas A&M University, CVM, VIBS Veterinary Medical Research Bldg (1197), Room #314, College Station

**DIRECTOR**
Terje Raudsepp, PhD
traudsepp@cvm.tamu.edu
979 862 2879
https://vetmed.tamu.edu/molecular-cytogenetics/

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**Molecular Genomics Core**

The Texas A&M Institute for Genome Sciences and Society (TIGSS) seeks to improve the lives of humans and animals and advance genomic research throughout the Texas A&M System. The goal of the TIGSS Molecular Genomics Core:

Enhance educational excellence through training of faculty, students and staff in genomic and analytical techniques
Expand infrastructure and facilitate access to instrumentation for genomic research and analysis
Increase collaboration with investigators throughout Texas A&M, the state of Texas and beyond.

**Major Equipment**
- Illumina NextSeq 500 and MiSeq Next generation sequencers
- Oxford Nanopore GridIon Nanopore sequencer
- BioNano Saphyr Optical DNA mapper
- 10x Genomics Chromium single cell genomics system
- EpMotion 5075 Fluid Handling robotic system
- Fluidigm C1 and BioMark HD microfluidics system for single cell sequencing and high throughput molecular analysis.
- BioRad droplet Digital PCR system for high resolution qPCR
- Biotek Cytation 5 plate reader and Imager
- BioRad CFX96 and CFX384 real time PCR systems
- Agilent TapeStation 2200 and 4200 Nucleic Acid Analyzer

**LOCATION**
266 Vet Med Research Annex
446 Reynolds Medical Building
College Station, TX

**ASSOCIATE DIRECTOR**
Andrew Hillhouse, PhD
hillhouse@tamu.edu
979-458-5678
www.genomics.tamu.edu
Multi-Crop Transformation Facility (MTF)

Plant transformation is a major bottleneck in genetic research among crops and especially in commercial varieties of agricultural importance. In order to leverage Texas A&M research and development capabilities, MTF provides high quality plant transformation services to the scientific community across Texas A&M AgriLife, TAMU, the Texas A&M University System, and external collaborators. Partnership with AgriLife Research Facilities including the Genomics and Bioinformatics Service Lab and the Crop Genome Editing Laboratory provides a solid plant transformation pipeline.

Major Skills and Equipment
- 20+ years of industry experience in plant tissue culture/transformation and Project Management
- Agrobacterium-mediated and Biolistic transformation capabilities for Plant Transgenesis and Genome Editing.
- Protocol validated in model crops and multiple commercial varieties
- Laminar flow hoods, growth chambers, light rooms, barcode tracking and greenhouse capacities

Location
Norman E. Borlaug Center, IPGB #159
498 Olsen Blvd., College Station, TX
979.458.1410
https://croptransformation.tamu.edu/

Protein Production Core

The goal of the Protein Production core is to provide cloning, expression and purification services of functional proteins at a scale that meets the quantity and purity benchmarks for structural, biophysical, biochemical, and therapeutics studies; employs bacteria and yeast host systems with a view to expanding into insect and mammalian host systems; and specializes in systematic method development for expressing and purifying challenging proteins.

Major Equipment:
- ÄKTA Pure 25L chromatography system – A flexible and intuitive purification system for proteins, peptides, and nucleic acids from microgram levels to tons of grams of target product in research applications.
- Jasco-720 Spectrophotometer - High sensitivity measurements in the near- and far-UV regions. High optical throughput, double prism monochromator, highly efficient nitrogen purge system, and simultaneous multi-probes.
- Avanti J-E centrifuge and Optima XPN-80 ultracentrifuge – capable of large scale and high efficiency cell lysisate separation and membrane preparation.
- MicroCal PEAQ-ITC - Allows direct, label-free in solution measurement of binding affinity and thermodynamics to provide a complete thermodynamic profile of the molecular interaction.
- Microfluidics' Microfluidizer M 110P – capable of large scale and high efficiency cell lysis.

Location
Institute of Biosciences and Technology
Houston

Director
Wen Liu, PhD
wen_liu@tamu.edu
713-677-7583
https://www.ibt.tamhsc.edu/cores/protein/index.html
Rodent Preclinical Phenotyping Core

The Rodent Preclinical Phenotyping Core houses various instruments to measure and quantitate mouse physiology and behavior. We offer a wide variety of state of the art equipment to help expedite comprehensive research in many fields, including Behavior, Cardiovascular, Cancer, Chemical, Metabolic, and Skeletomuscular.

Major Equipment

- TSE Phenomaster- measures food/water intake, activity monitoring, and calorimetry/O2/CO2 measurements.
- Noldus Ethovision XT- video tracking software that tracks and analyzes behavior, movement, and activity.
- Vevo 3100 LT Ultrasound- real time, in vivo physiological information: B-Mode, M-Mode, Color Doppler, and PW Doppler.
- Storz Rodent Endoscope- small animal endoscopy for various diagnostic, surgical, and orthopedic indications.
- EchoMRI-130- body composition analyzer for live subjects, whole body fat, lean, free water, and total water masses.

LOCATION
TAMU Reynolds Medical Building

ASSOCIATE DIRECTOR
Alex Trott, PhD
atrott@tamu.edu
940.368.2374
https://genomics.tamu.edu/preclinical-phenotyping/

Texas A&M Institute for Genomic Medicine

The Texas A&M Institute for Genomic Medicine (TIGM) is an essential resource for researchers looking to obtain transgenic services. Since 2006, TIGM has delivered more than 800 mouse and cells orders to more than 340 academic and commercial institutions in over 26 countries. These are featured in more than 230 peer-reviewed publications. TIGM provides transgenic core services to researchers within and outside the Texas A&M system including blastocyst or pronuclear injections (including CRISPR/Cas9), rederivation, embryo transfer, design and production of vectors for custom knockout (stable and Cre-ready conditional) and knock in projects, various aspects of ES cell manipulations and embryo and sperm cryopreservation.

LOCATION
College Station

EXECUTIVE DIRECTOR
Dr. Ben Morpurgo, PhD
bmorpurgo@tigm.org
979.458.5494
http://www.tigm.org/tamus_services/

Texas A&M Institute for Genomic Medicine (TIGM) facilitates breakthroughs in science and medicine and accelerates the pace of medical discoveries through internal research and by providing our resources, training and services to the scientific community at Texas A&M, The State of Texas, and the world.
The AggieFab Nanofabrication Facility is a class 100/1000 nano/microfabrication cleanroom facility, equipped with full ranges of micro/nano-scale fabrication on diverse materials. Over 35 instruments are placed in four cleanroom bays, categorized into: lithography/patterning, deposition/diffusion, plasma etching, bonding/dicing, rapid prototyping, and characterization.

Major Equipment (few examples)
• FEI Helios NanoLab 460F1 DualBeam Focused Ion Beam (FIB): direct nanopatterning with ion beam and imaging with electron beam; TEM sample preparation using EZ lift
• Tescan Mira 3 electron beam lithography tool with DrawBeam patterning software
• Zeiss Orion Plus Helium Ion Microscope/NanoFab: 10nm patterning resolution; biological material imaging
• EVG 610 double-sided mask aligner
• Nanoscribe Photonic Professional GT2: maskless sub-micron-resolution 3D printer (being acquired)
• Tystar LPCVD: deposit low temperature SiO, and low stress SiN,
• Lesker Sputter and Evaporator: deposit metals and insulators
• Clustex multi-sputter tool: 20 magnetron arms (DC/RF)
• Oxford PECVD: deposition of SiOx, SiNx and SiOxNy
• Oxford ICP RIE: selective etch of Si, SiO, and SiN
• EVG510 Wafer Bonder
• Veeco N91000 and Bruker DektakXT Profilometers
• EnvisionTech high-resolution 3D printers, PLS Laser engraver

LOCATION
GERB, 1617 Research Parkway
TAMU, College Station

DIRECTOR
Arum Han, PhD
arum.han@tamu.edu
979-458-8854
https://aggiefab.tamu.edu
Biomedical Engineering Shared Laboratories

The Biomedical Engineering Shared Laboratories are a collection of controlled access labs that house various equipment shared amongst the Biomedical Engineering faculty. The main purposes of these facilities are to provide more, cost-effective resources for the research groups and to minimize duplication of equipment within the department. Equipment is available to other TAMU departments and external users.

Major Equipment
- EnvisionTEC 3D Bioplotter in biological safety cabinet
- Molecular Devices ImageXpress Micro Confocal – High-throughput imaging system
- Biotek CytoLyte 5 Imaging reader
- Resonetics RapidX250 Excimer Laser
- Gravograph LS100-40W CO2 Laser
- NanoSight LM10 Nanoparticle Tracking Analysis
- Malvern Nano ZS Zetasizer – DLS and Zeta Potential
- Beckman Coulter Optima MAX-XP Ultracentrifuge
- JEOL JCM-5000 Neoscope Scanning Electron Microscope
- Anton Paar MCR 301 Rheometer
- TA Instruments Q800 DMA, Q20 DSC and Q50 TGA
- HAAS Super Mini CNC Mill

LOCATION
Emerging Technologies Building
Texas A&M University
101 Bizzell St.
College Station, TX 77843

COORDINATOR
Amanda Myatt
amyatt@tamu.edu
979-458-2317

IODP Core Scanning Laboratory

The core scanning laboratory at IODP allows rapid non-destructive lithological characterization of sediment and hard rock cores. The laboratory mostly supports the research activities of the JOIDES Resolution, but it is also open to the public. Scientists from around TAMU and around the world can come to study the cores stored in the Gulf Coast Repository, or they can bring their own.

Major Equipment
- Avaatech XRF Core Scanners (2) – capable of performing automated EDS-XRF analyses at user-defined locations on the surface of a core or other flat sample; 100W Rh tube, maximum 50kVp, 2.0mA, capable of measuring from Mg to Ce (semi-quantitative)
- Section-Half Image Logger – capable of producing high-resolution line scan images of core sections
- Whole-Round Multi-Sensor Logger – capable of measuring the magnetic susceptibility and density (gamma-ray) of core sections
- Chemistry Lab – 1.5 rooms dedicated as chemistry labs with fume hoods rated for HF and perchloric acid
- Other – Additional equipment soon to be added include an SEM, UV/Vis spectrometer, SRA, GC, and IC

LOCATION
International Ocean Discovery Program (IODP)
1000 Discovery Dr

DIRECTOR
Brian LeVay, PhD
levay_b@iodp.tamu.edu
979-458-1155
http://iodp.tamu.edu/labs/xrf/
Materials Characterization Facility

The Materials Characterization Facility (MCF) is a core user facility that provides researchers with access to high-end instrumentation essential for characterization of structure and properties of various materials, surfaces and interfaces. MCF is staffed by research scientists with expertise in different areas providing fundamental research training to internal and external users, consolation of measurements needs and data interpretation.

Major Equipment
- Titan Themis® Scanning Transmission Electron Microscope (S/TEM) with EFTEM, EDXS and EELS.
- Lyra-3 and Fera-3 Focused Ion Beam - Scanning Electron Microscope with (FIB-SEM) with EDS, EBIC, EBSD, TOF-SIMS and in-situ loading/heating stages.
- Osmicron X-ray and UV Electron Spectroscopy (XPS/UPS) system with Argus detector.
- Bruker Dimension Icon Atomic Force Microscope (AFM) and Anasys nanoIR2-s Atomic Force Microscope Infrared Spectroscope (AFM-IR)
- Horiba Jobin-Yvon LabRam HR Raman Confocal Microcope.
- Cameca SXFive electron microprobe with EDS.
- Hysitron TI 950 Triboindenter/Nanoindenter.

LOCATION
Frederick E. Giesecke Engineering Research Building
1617 Research Parkway
College Station
DIRECTOR
Miladin Radovic, PhD
mradovic@tamu.edu
979-845-5114
https://mcf.tamu.edu/

The National Center for Therapeutics Manufacturing is an interdisciplinary workforce education and research center serving the global vaccine and biopharmaceutical manufacturing industries. NCTM’s technical staff can support your bioprocess research, development, and scale-up needs with its wide selection of bench- and pilot-scale microbial and mammalian bioreactors, chromatography systems, and analytical equipment. Equipment use agreements are customizable and can also include trained operator time and documentation.

Major Equipment / Capabilities
- Bacterial/mammalian cell (CHO, VERO, etc.) expression systems
- 5-10L Eppendorf BioFlo bioreactors; 125L stainless steel stirred tank bioreactor with CIP capability; 10L Sartorius B Plus stirred tank reactor; 50L Sartorius BIOSTAT RM single-use system
- Microfluidics homogenizer, tubular and disc-stack centrifuges, and Millipore Millistak+® Pod depth filter holder
- Spectrum Krosflo and Millipore Pellicon® TFF membrane filtration systems;
- ÄKTA Avant 25, Avant 150, ÄKTA Pilot systems and GE AxiChrom™ columns
- Tecan Freedom EVO liquid handling system, Dionex Ultimate 3000 HPLC system, Biotek Synergy H1 multi-mode plate reader, Biotek ELx50 ELISA plate washer, Bio-Rad ChemiDoc gel, TOC water analyzer, thermal cycler, and UV-VIS specs
- Class II A biosafety cabinets, CO2 incubators, LN2 cryo storage, cell counters, microscopes

LOCATION
100 Discovery Drive, 4482 TAMU
College Station, Texas 77843-4482
nctm.tamu.edu
programs@NCTMmail.tamu.edu
DIRECTOR
Zivko Nikolov, PhD
znikolov@tamu.edu
(979) 458-0763
The National Corrosion and Materials Reliability Laboratory (NCMRL) goal is to preserve and extend the integrity of the structures, such as buildings, bridges, pipelines, roads, ports and offshore platforms that can be continuously occupied and operational during the entire design life of current or new civil infrastructures. The NCMRL conducts state-of-the-art research in close collaboration with industry, for the development, testing and assessment of corrosion-resistant materials, corrosion mitigation strategies, corrosion sensors and asset life prediction tools. To achieve the goals and vision of the laboratory the NCMRL facilities and equipment are organized across the following research lines:

- **Atmospheric Corrosion**: 2 Fog chamber LF 8151 QS Model
- **Advanced surface electrochemistry characterization:**
  - Scanning Kelvin Probe
  - Scanning Vibrating Electrode Technique
  - Localized Electrochemical Impedance Spectroscopy
  - Scanning Electrochemical Microscopy
- **Coating system evaluation and testing laboratory**
  - Gamry Reference 600 potentiostats
  - Gamry 600+ potentiostats
- **Faraday cages (custom made)**
- **Coating system evaluation and testing laboratory**
- **Extreme service conditions materials selection laboratory**:
  - Cortest Autoclave with 5 lt capacity, made with Hastelloy C-2000, rated at 6000 psia and 350°F, equipped for electrochemical testing
  - CERT frames capable up to 10,000-pound force. This are instrumented to perform slow strain rate, constant load and ripple testing following applicable standards at both room conditions and high pressure and temperature
  - Laboratory capable of handling experiments with H2S

**Location**
Centre of Infrastructure Renewal Building in the new Texas A&M University RELLIS campus (https://cir.tamu.edu/facilities/national-corrosion-materials-reliability-lab/)

**Director**
Romero Castaneda, PhD
hcastaneda@tamu.edu

Raymundo Case, PhD
Raymundo.Case@tamu.edu

The new Soft Matter Facility (SoMF) is the user facility funded by an RDF grant. The facility is focused on characterization of multifunctional soft materials. The facility includes four instrumentation suites:

1. **Processing & Mechanics**
   - Microcompounder & Injection Molder
   - Spin Coater
   - Dynamic Mechanical Analysis (DMA)
   - Rotational Rheometer
   - Differential Scanning Calorimetry (DSC)
   - Thermogravimetric Analysis (TGA) with Mass Spectrometry Attachment

2. **Molecular Characterization**
   - Four Gel Permeation Chromatography (GPC) Instruments for Ambient & High-Temp Analysis in Different Solvents
   - Membrane Osmometer

3. **Thin Film & Interfacial Analysis**
   - Nanosizer Zetasizer

4. **Nanostructure Characterization**
   - Small Angle X-ray Scattering (SAXS)

**Location**
Testing & Characterization Facility (TCF) Building
1313 Research Parkway
College Station, TX 77845
Website: somf.engr.tamu.edu

**Director**
Svetlana Sukhishvili, PhD
directorsofm@tamu.edu

**Coordinator**
David Truong, PhD
pvtruong@tamu.edu
The X-ray Diffraction Laboratory is a full-service facility that provides TAMU researchers with access to high-end instruments routinely used for determining the three-dimensional structure of molecules and solids. The facility has two full-time PhD crystallographers who assist students, postdocs, and faculty members with data collection and analysis tasks. Full service is also available including to occasional outside users and collaborators.

Major instrumentation.

- Bruker single crystal instruments
  - Venture (Cu)
  - Quest (Mo)
  - D8 Duo (Mo,Cu)
  - APEX2 (Mo)
- Bruker powder diffractometers
  - Davinci
  - ECO
  - D8 Advanced
  - D8 Advanced (OVEN RT-1000C)

Available services include: single crystal diffraction, wide angle diffraction, high resolution diffraction, 2D powder diffraction, structure solution of single crystal and powder materials, qualitative and quantitative phase analysis, micro powder diffraction, crystallinity measurement, residual stress analysis, line broadening analysis, thin film analysis, and pole figure analysis.

The users may opt to submit their samples to the facility for structural analysis or to have students and postdocs trained to use the equipment if frequent use is expected. The hands-on aspect of the laboratory is one of the hallmarks of our PhD and postdoc education, as many research groups depend on X-ray crystallography for the main method of characterization.

Data Informatics and Computation
Crop Genome Editing Laboratory (CGEL)

The goal of the Texas A&M AgriLife Research Crop Genome Editing Lab (CGEL) is to test novel approaches for high-throughput CRISPR/Cas-based crop gene editing and to offer a gene editing service to crop research and breeding groups. A pilot X-Grant project is underway to bring Texas A&M to the forefront of the field of genome editing for crop improvement. Seed grant projects for gene editing across multiple crops have also been initiated by CGEL and the Multi-Crop Transformation Facility in collaboration with research and breeding groups at Texas A&M to develop new gene-edited products with potential to be commercialized.

LOCATION
Centeq Building, Suite 220
College Station

DIRECTOR
Michael Thomson, PhD
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https://agrilife.org/cgel/

Genomics and Bioinformatics Service


In our 10th year, we have completed over 2500 projects and worked with over 1000 scientists from 36 countries, grown to be one of the leading agrigenomic sequencing facilities in the world. Our team work with faculty across the Texas A&M System, providing support for grants totaling over $135 million.

LOCATION
Centeq Building A, Suite 250
College Station

DIRECTOR
Charlie Johnson, PhD
charlie@ag.tamu.edu
979-862-3262
https://www.txgen.tamu.edu

Major Equipment ($7.8M/10 years)

- Illumina NovaSeq 6000 Sequencing System (x2)
- Illumina Dragen HPC system
- PacBio Sequel SMRT Sequencing System
- Illumina HiSeq 4000 Sequencing System
- Illumina MiSeq Sequencing System
- Illumina iSeq 100 Sequencing System
- PerkinElmer JANUS G3 NGS Express Workstation
- PerkinElmer Sciclone G3 Liquid Handling Workstations (x2)
Laboratory for Molecular Simulation

The mission of the LMS is to bring atomistic modeling closer to the experimental scientist by offering training and cutting-edge molecular modeling software for applications ranging from quantum calculations on "small" molecular or solid systems to molecular mechanics/dynamics modeling for proteins, DNA, nanoparticles, polymers, solids, and liquids. The LMS is also committed to expanding the incorporation of molecular modeling into TAMU university courses.

LOCATION
Room 2109
Department of Chemistry
College Station

DIRECTOR
Michael B. Hall, PhD
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979-845-1843
https://lms.chem.tamu.edu/

Major SOFTWARE and HARDWARE:
• Materials Studio: Visualizer, Conformers, Forcite Plus Parallel, QSAR+, Refex, VAMP, CASTEP, DFTB+, etc.
• Discovery Studio: Visualizer, Analysis, Biopolymer, Catalyst Conformation, CHARMM, De Novo Ligand Builder, etc.
• Schrödinger: Maestro, CombGlide, Glide, Jaguar, etc.
• MOE: a fully integrated drug discovery software package.
• Gaussian, AMBER, MOLPRO, ADF, LAMMPS, Desmond, ORCA.
• Linux Teaching Lab - 17 Dell Precision workstations, NVIDIA GPU.
• Two HPC clusters: 1088-core cluster and 312-core cluster.

Rigor and Reproducibility Core

Mission
• To assist investigators to incorporate Rigor and Reproducibility into their research proposals.
• To collaborate with researchers to perform rigorous statistical and bioinformatics analysis for their research projects.
• To train the next generation scientists for the good practice of Rigor and Reproducibility.

Staffing
• Director: Kurt Zhang, PhD
• A postdoctoral fellow for bioinformatics/biostatistics
• 2 graduate students

Operations
Functions as IBT Core / TAMU – qualified Service Center
iLabs scheduling and project management
Administrative Core to manage workflow
Smart Grid Control Room Lab

The Control Room Lab (CRL), a facility of the TEES Smart Grid Center, is an innovative vision of a large-scale seamlessly integrated Power System Control Center of the future, featuring facilities that emulate end-to-end control systems and a training room. The CRL functions as a living laboratory, one that continuously monitors certain sites in various grids through virtual substation equipment, as well as some actual sensors.

Major Equipment

- Simulation system for continuously monitoring certain sites in various grids through actual or virtual substation equipment.
- Advanced visualization tools for electric grid control center emulation.
- A wide variety of electric grid analysis software
- Training room integrated with the simulation system with 24 dual monitor computers.

TIGSS Bioinformatics Core

The Texas A&M Institute for Genome Sciences and Society (TIGSS) started offering Bioinformatics services and support since January of 2012.

Accelerate data analysis through standardized gold-standard pipelines
- Provided computational resources tailored for Bioinformatics data analysis and computational biology research
- Assist in software development streamlined data analysis pipelines.

- Next-generation sequencing generates huge amounts of data and the size of data sets is further compounded by number of samples and conditions being investigated. Such data generation tasks often require at least some form of storage and ease of access to foster multi collaborative research and to construct, model and engineer new approaches to solve the complexity and challenges of big data analysis through high performance computing.

- With programming expertise in various computer languages (Perl, Python, MATLAB, R, JavaScript, MySQL, CSS, HTML) TIGSS Bioinformatics Core can efficiently design custom computational analysis pipelines to better perform secondary and tertiary data analysis.

- Few examples of software developed by the core and open-sourced for biological data analysis:
  - SBEToolbox is a GUI based Matlab toolbox for biological analysis
  - lncRNApipe is an open-source command-line automated software to predict novel long non-coding RNA from mRNA-Seq data.
An interdisciplinary center, CACE, provides a platform for collaborative research projects with members across campus addressing the roles of atmospheric chemistry in fundamental chemical processes, environmental threats resulting from climate change, the exploration of new technologies and mitigation strategies to reduce the impacts of climate change, as well as chemical aspects of air quality and human health.

Major equipment:
Sigmaspace micro-pulse LIDAR, used to generate vertical maps of aerosol and cloud properties. Available for ground, mobile, and shipboard projects lead by on and off-campus users.
Collaborative Resource in Biomolecular NMR

The Department of Biochemistry & Biophysics maintains a state-of-the-art solution NMR spectroscopy collaborative resource for studies of the structure and dynamics of biological macromolecules.

**Major Equipment**
- Bruker NEO 800 MHz NMR 4-channel spectrometer equipped with a triple resonance $^1$H detection He-cooled cryoprobe and SampleJet sample changer
- Bruker Avance III HD 800 MHz NMR 4-channel spectrometer equipped with a triple resonance $^1$H detection He-cooled cryoprobe.
- Bruker Avance III HD 600 MHz NMR 4-channel spectrometer equipped with a triple resonance $^1$H detection He-cooled cryoprobe.
- Bruker NEO 600 MHz NMR 4-channel spectrometer equipped with a triple resonance $^1$H detection N2-cooled cryoprobe also tunable to $^{19}$F.
- Bruker Avance III HD 500 MHz NMR 4-channel spectrometer equipped with a triple resonance $^1$H detection He-cooled cryoprobe.

**LOCATION**
NMR Wing (Bldg 1507)
Biochemistry & Biophysics
300 Olsen Blvd
College Station

**DIRECTORS**
A. Joshua Wand, PhD
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Tatyana Igumenova, PhD
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Elemental Analysis Laboratory

The EAL at Texas A&M University is a component of the Department of Chemistry's Center for Chemical Characterization and Analysis. The laboratory provides research support in the area of elemental and trace analysis. Our lab is distinguished in that we feature fast neutron activation analysis (FNAA) capabilities in addition to thermal instrumental neutron activation (INAA) using the NESC 1 MW TRIGA research reactor. In addition, the laboratory provides training and access to a state-of-the-art ICP-MS.

**Major Equipment**
- Two Kaman A-711 14-MeV Neutron Generators.
- Suite of HPGe Gamma-ray Spectrometers, including low-background counting.
- PerkinElmer NexION 300D ICP-MS.
- Cetac ASX-520 Liquid Autosampler.

**LOCATION**
Olin E. Teague Research Center

**MANAGER**
Bryan E. Tomlin, Ph.D.
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http://eal.tamu.edu
The Geochemical and Environmental Research Group (GERG) is a research center providing a wide range of capabilities including field acquisition, analyses, and interpretation of data across several different interlocking themes in environmental sciences, ocean sciences, and resource geosciences. It operates a variety of Autonomous Ocean Vehicles, Gliders, Surface ASVs, Buoys and HF Radars. GERG is also part of the Applied Mass Spectrometry Core of the University. It has (11) Mass Spectrometers and various other analytical equipment for both targeted and untargeted analysis of contaminants and natural products in a number of matrices from soils, tissues, wafer, seawater and tissues. It has a large BSL2 facility for other matrices.

LOCATION
833 Graham Road
College Station, Texas 77845

DIRECTOR
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The goal of the ILSB-MSL is to provide advanced native mass spectrometry capabilities for analysis and characterization of proteins/protein complexes as well as how ligands (small molecules, metals, lipids, nucleic acids) influence their structure/function. The lab supports fundamental and applied multi-investigator, multi-institutional research using state-of-the-art native ion mobility-mass spectrometry instruments. The research capabilities of ILSB-MSL are leveraged by an NIH P41 grant “Resource in Native MS-Guide Structural Biology”, thereby providing researchers access to unrivaled native ion mobility/mass spectrometry resources.

LOCATION
Interdisciplinary Life Science Bldg
Room 1172/1195

DIRECTOR
David H. Russell, Ph. D.
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979/845-3345
https://ilsbms.chem.tamu.edu

Major Equipment
• Agilent 6560 HPLC-Ion Mobility-Q-ToF MS.
• Agilent 6545XT HPLC-Q-TOF MS modified for 25 kDa. mass range
• ThermoFisher HPLC Fusion Orbitrap MS (cutting edge proteomics)
• P41 Resource Instruments: Waters Synapt G2 TWIMS, 2 ea.
• ThermoFisher-Exactive EMR IMS, and Q-Exactive UHMR (80 kDa mass range) modified for high resolution IMS.
NMR/ESR Facility of the Chemistry Department

Our NMR/ESR facility includes 8 solution NMR spectrometers, a solid-state NMR, and an EPR instrument. Although all instruments are physically housed within buildings of the Chemistry Department, access and services are provided to the entire TAMU community and beyond. The goal is to enable faculty to pursue cutting-edge research on all aspects of molecular species and materials.

Major Equipment (details: https://nmr.chem.tamu.edu/index.php)
- Avance 400 (Solids NMR): new instrument will replace old one soon!
- Avance III 400 (ILSB)
- Avance Neo 400 (2 instruments)
- Avance 500
- Varian NMR 500
- Varian NMR 300 (dedicated to teaching)
- Varian NMR 500 (Reed McDonald)
- Inova 500
- EPR (paramagnetic species)

LOCATION
Chemistry Department of
Texas A&M University
Chemistry, Reed McDonald, and ILSB
College Station

DIRECTOR
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979-845-7749
https://www.chem.tamu.edu/group/bluemel/index.html

Protein Chemistry Laboratory

The PCL core facility supports metabolomics research by providing state-of-the-art instrumentation, systems, software, technical expertise and training for the application of modern protein chemistry and proteomic technologies. With services including imaging mass spectrometry, amino acid analysis, chromatographic separations and both MALDI-TOF and LC-ESI MS based analysis, the PCL provides researchers on campus with a significant resource to increase their impact on the scientific community at large.

Major Equipment
- Ultraflextreme MALDI-TOF-TOF – Top Down and Bottom Up protein sequencing. In addition the Ultraflextreme is capable of Imaging Mass Spectrometry.
- Exact Orbitrap – Liquid chromatography high resolution accurate mass spectrometry system
- Ettan Robotic Systems: Robotic systems for High-throughput Proteomics analysis; Spot Picker, Digestor, (MALDI plate) Spotter
- AAA Analyzer – Agilent 1260, G1365, DG1321B combined with a programmable autosampler.

LOCATION
Biochemistry / Biophysics
College Station

DIRECTOR
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979-845-2965
https://pcl.tamu.edu/
Radiation Effects Facility

The Cyclotron Institute's Radiation Effects Facility provides a convenient and affordable solution to commercial, governmental, and educational customers in need of studying, testing, and simulating the effects of ionizing radiation on electronic and biological systems. The facility features two dedicated beam lines with diagnostic equipment for complete dosimetry analysis and beam quality assurance. A beam energy degrader system allows for a change of linear energy transfer (LET) without cyclotron re-tuning or target rotations.

Major Equipment / Information:
- K500 Superconducting Cyclotron – ion beams of He, N, Ne, Ar, Cu, Kr, Ag, Xe, Pt, Ho, Ta, Au at 15, 25, 40 MeV/u.
- K150 (88”) Cyclotron – proton beams at 3 – 45 MeV (tunable) and ion beams of He, N, Ne, Ar, Cu, Kr at 15 MeV/u.
- Dedicated beam line on each cyclotron complete with SEUSS dosimetry system and remote controlled staging system.
- Two data rooms with setup / staging areas.
- Machine and electronics shop time available on request.
- Beam time available 24 hours per day / 7 days per week.
- Over 4,000 hours available annually.

Stable Isotope Geosciences Facility

Established in 2009, the Stable Isotope Geosciences Facility brings together under one roof the College of Geoscience’s mass spectrometers for light stable isotope measurement, ensuring reliable and timely analyses to TAMU’s faculty, staff, and students. We use isotopic measurements of hydrogen, carbon, and nitrogen - elements necessary for life - to reveal clues about the history and workings of our oceans, atmosphere, lithosphere, and biosphere.

Major Equipment -- Thermo Fisher Scientific IRMS
- DeltaPlusXP isotope with Carlo Erba NA 1500 Elemental Analyzer (EA) -- analyze a broad range of organic sample types for δ13C, and δ15N compositions.
- Delta V Advantage with Flash EA to analyze δ34S, δ13C and δ15N of organic matter and with GasBench II δ13C analyses of natural water dissolved inorganic carbon (DIC), soil gas, breath gas, etc.
- Delta V Advantage with GC-Isolink, -- analyze H, C, and N isotope analyses on specific organic compounds.
- MAT 253 dual inlet IRMS Kiel IV Automated Carbonate Device -- high-precision carbonate δ13C and δ18O analyses.
- MAT 253 Plus and modified Kiel IV Automated Carbonate Device -- clumped isotope analyses of carbonate samples.
- Picarro Li2120 Cavity Ring-Down Spectrometer (CRDS) Water δ18O and δD analyses.
The purpose of the SIBS Lab is to provide Isotope Ratio Mass Spectrometry (IRMS) methods that enable unique and quantitative studies in the biogeoosciences to address questions related to energy flow, element cycling, organismal physiology, hydrology, and land-atmosphere interactions. The lab is capable of analyzing organic materials (plants, animals, microbes, specific organic compounds), atmospheric gases (CO₂, CH₄, N₂O), water, and other environmental materials for H, C, N, O, and S isotope ratios.

Major Equipment:
- ThermoFisher Delta V Advantage Isotope Ratio Mass Spectrometer interfaced with a Carlo Erba Flash elemental analyzer to enable δ¹³C, δ¹⁵N, δ³⁴S, %C, %N, and %S on plant and animal tissues, soils, sediments, and other organic and inorganic materials.
- ThermoFisher Delta V Advantage Isotope Ratio Mass Spectrometer interfaced with a TC/EA high temperature conversion elemental analyzer to obtain δ²H and δ¹⁸O on water and organic materials, and with a Gas Bench/Precon system to enable isotopic measurements on atmospheric trace gases.
- ThermoFisher MAT253 Plus Isotope Ratio Mass Spectrometer interfaced with a Trace GC system to obtain δ¹³C, δ¹⁵N, δ¹⁸O and δ³⁴S on specific biochemical compounds (e.g., alkanes, lipids, amino acids, etc.). Linkage with a quadrupole mass spectrometer also provides compound identification and quantification.

LOCATION:
Kleberg Building, Texas A&M College Station, TX

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