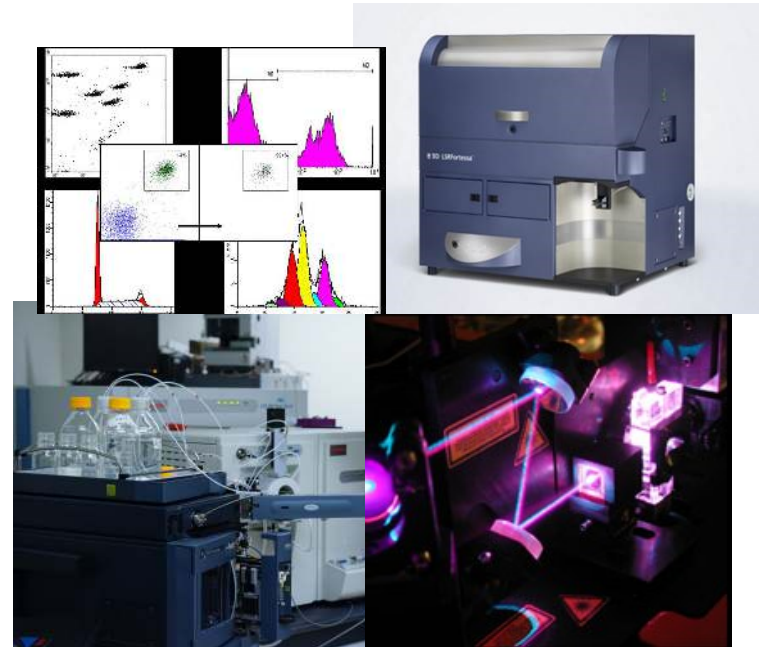


Showcase of Medical Discoveries:
A Focus on Core Facilities



Wednesday, February 22, 2017
4:30—6:00 p.m.

***A Wine & Cheese Reception Featuring
UAMS Core Directors Presenting their
Instrumentation and Services.***

Winthrop P. Rockefeller Cancer Institute
10th Floor Rotunda



Flow Cytometry Core Facility



The Flow Core Facility houses the BD LSRFortessa and BD FACSAria IIIu. The Fortessa has 4 lasers (488, 561, 633 and 405) and capability to analyze up to 16 colors at once, as well as a FSC PMT to allow for detection of smaller particles. The FACS Aria also has 4 lasers and 15 different detectors. The Aria can analyze cells labeled with up to 15 different fluorochromes. In addition, the FACS Aria can also perform sterile cell sorting. The FACS Aria is primarily used for cell sorting and serves as back-up to the Fortessa. The Aria can sort up to 4 different cell populations at a time into either tubes, 96, 6, or 12 well plates. The Flow Core also has FlowJo analysis software. Analysis can be done by core personnel or there is a FlowJo workstation available for users to analyze their own data. Experimental consultation is also available with core personnel.



BD LSRFortessa

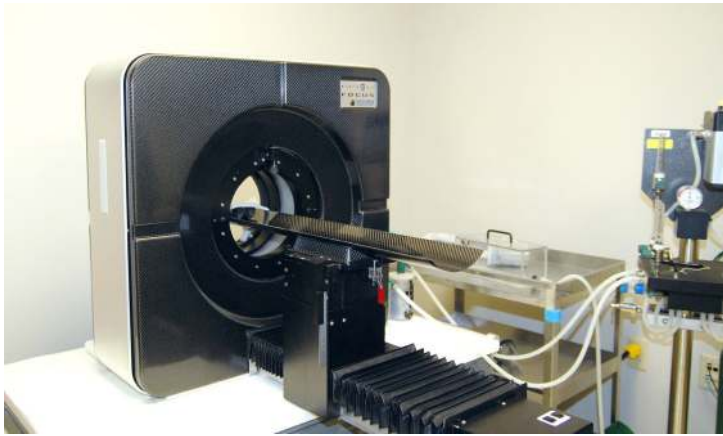
Science Communications (SciCom) Core



SciCom provides investigators with editorial and project-management services as well as assistance with budgets and required forms. Editorial services range from simple grammatical assistance (e.g., a scientist whose native language is not English) to substantive editing with suggestions for textual revision and reorganization. For large multi-investigator projects, such as a NIH program project (P01) or center grant (P20, P30, U01), we offer the following project-management services that include: a) organizing regular meetings, face-to-face or by teleconference, b) establishing lines of communication/coordination among a center or program project's principals, and c) establishing and monitoring schedule adherence for project/primary components submission (e.g., series of edits) compatible with institutional deadlines for application assembly and submission.



Molecular Imaging Core



The Molecular Imaging Core provides comprehensive services for non-invasive imaging with a 7 T Magnetic Resonance Imager (MRI) and a MicroPET (Positron Emission Tomography). These instruments can be used to image small animals, biological tissues, phantoms, appendages of human subjects, and many other samples. Our services include:

- Consultation on development of imaging protocols, (e.g., choice of imaging modalities/techniques most appropriate for a project)
- Assistance with experimental design and submission to the IACUC
- Preparation/monitoring of animals prior to and during imaging
- Quantitative analyses of images obtained with the 7T MRI, MicroPET and other devices .



UAMS DNA Sequencing Core Facility



The UAMS DNA Sequencing Facility offers Sanger and Next Generation Sequencing on a fee for service basis. For Sanger sequencing, we use an Applied Biosystems, 3130xl Genetic Analyzer and regularly achieve read lengths of approximately 1000 bases. Results are returned as web links to text files and graphic files which can be viewed by widely available freeware.

For Next Generation Sequencing, we use an Illumina Miseq and currently offer three applications.

- Small Genome Sequencing
- RNA sequencing
- 16S Metagenomics Sequencing

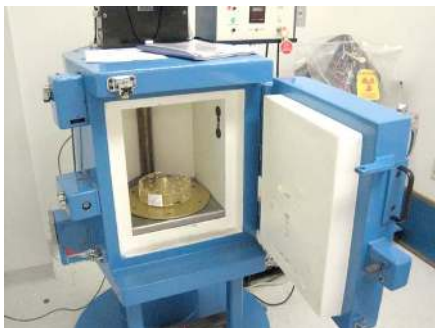
Results are returned as web links to Illumina's BaseSpace Cloud Service, which also has a variety of bioinformatics apps. We also offer bioinformatics services such as mapping, differential expression, variant calling, and 16s metagenomics microbiome identification.



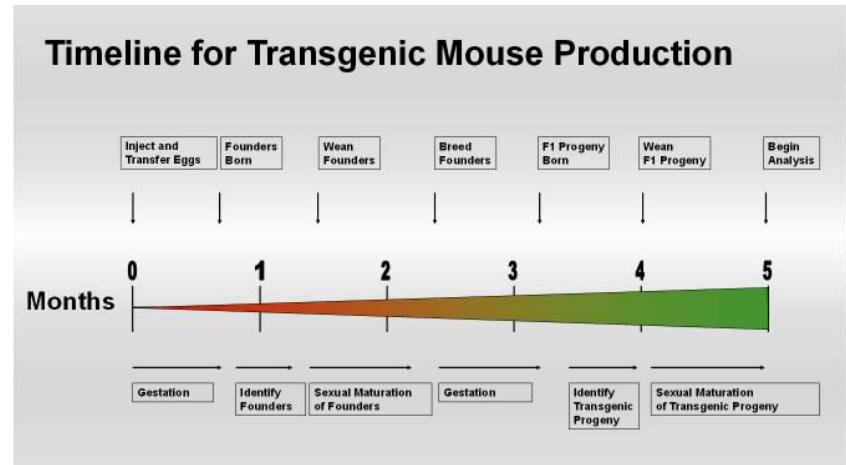
Irradiation and Animal Core



The Irradiation and Animal Core assists in the design and execution of experimental radiation models with the use of experimental cesium source irradiators, X-ray machines, and beta-emitter sources available on campus. Radiation models span from whole body irradiation of organisms to precision computed tomography (CT) – guided irradiation of tumors or organs with radiation beams down to less than 1 mm in diameter. We also provide radiation biology expertise and assist in determining which radiation model is most appropriate for your research goals.

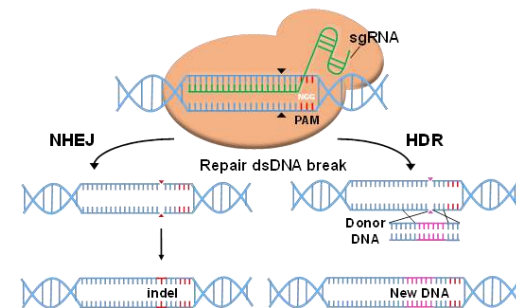


Transgenic Mouse Core Facility



The UAMS Transgenic Mouse Core offers several services related to the production and maintenance of genetically modified mice. We produce traditional transgenic mice in the C57BL/6 or CB6F1 genetic background. We also produce gene-edited mice using the CRISPR-Cas9 system. Gene editing can be used to inactivate a gene, insert an epitope tag onto an endogenous protein, or change the amino acid sequence of an endogenous protein, in addition to other modifications. Maintenance services such as sperm cryopreservation and in vitro fertilization are also available.

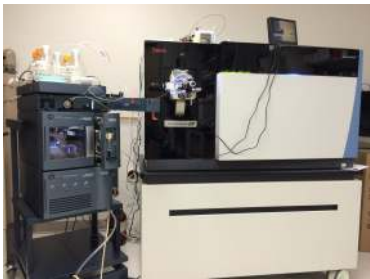
CRISPR-Cas9 system



Proteomics Core Facility



The Proteomics Core Facility provides protein characterization by mass spectrometry. This includes identification of unknown proteins, quantitative comparison of proteins in biological samples, and mapping of post-translational protein modifications. Instrumentation associated with the Proteomics Core includes state-of-the-art Orbitrap Fusion (Thermo) and LTQ Orbitrap Velos (Thermo) mass spectrometers. The core also maintains an on-site Mascot Server (Matrix Science) as well as MaxQuant (Max Planck Institute) and Scaffold Q+S, PTM and perSPECTives (Proteome Software) licenses for data analysis.



Winthrop P. Rockefeller Cancer Institute Genomics Core Laboratory



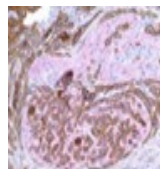
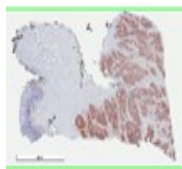
Winthrop P. Rockefeller Cancer Institute Genomics Core Laboratory provides researchers with initial consultation for study design and support, sample size calculation and power analysis. Core lab instrumentation includes Illumina HiSeq 3000 and NextSeq 500 sequencers, Illumina iScan BeadArray scanner, Tecan dedicated robot for Illumina assays, Agilent Bioanalyzer, Advanced Analytics Fragment Analyzer, and Qubit 3.0 fluorometer, as well as associated equipment necessary for performing genetic and genomic assays. With this instrumentation, the lab provides analysis of RNA and DNA for sizing, quantification, and quality control, Illumina gene expression analysis by RNA Seq for human and mouse, Illumina SNP/CNV analysis by BeadArrays for human-based studies, and whole-genome methylation assays by use of Illumina array-based DNA methylation analysis. The core can also provide sample and library preparation for high-throughput sequencing of any organism using the Illumina cBot and Genome Analyzer IIX. Sequencing services include *de novo* or targeted resequencing, mRNA sequencing, small RNA discovery, ChIP-Seq, and sequencing based methylation analysis.

Poster #5

Translational Pathology Shared Resources: Experimental Pathology Core Laboratory



The Experimental Pathology (ExPath) Core Laboratory provides investigators with centralized, comprehensive histological services. The core can process and section frozen and paraffin-embedded tissues. Slides can be prepared for staining, molecular studies, and laser capture dissection. The core provides a variety of standard pathological stains for histochemical analysis of tissues, including hematoxylin and eosin, special stains, and immunohistochemistry. As needed, the laboratory works with investigators to develop immune-staining approaches for detecting specific targets of interest. The core is equipped with two Aperio slide scanners (bright-field and fluorescence) for capturing whole-slide images, which can be analyzed using Aperio ImageScope software with algorithms for color deconvolution, nuclear and membrane localization, and quantifying positive pixel number and intensity. Finally, clinical pathologists can assist with image analysis and data interpretation.



Poster #10

Ultrasound Imaging Core



Ultrasound imaging offers non invasive assessment for cardiovascular, vascular biology and cancer research, including pulse-wave and color Doppler imaging and non-targeted/targeted contrast imaging with MicroMarkers.

The VisualSonics Vevo 2100 system ultrasound instrumentation uses high-frequency, high-resolution digital imaging with linear array technology and color Doppler for general anatomical localization. It is particularly valuable in specialized research applications such as cardiac functional analysis and blood flow quantification in a variety of vascular beds.



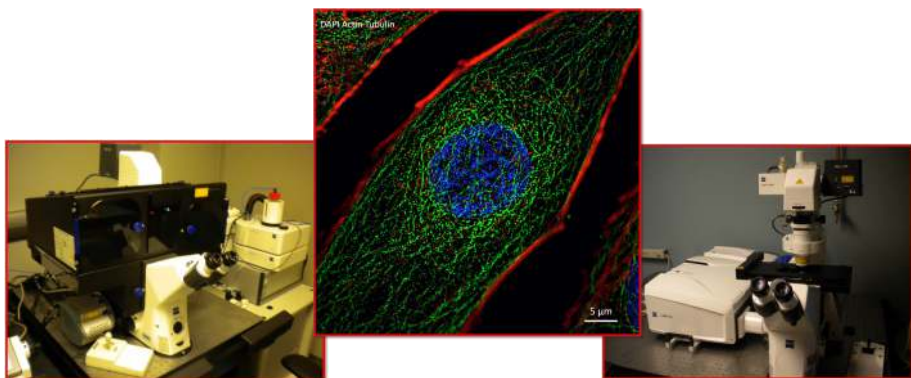
Poster #9

Digital Microscopy Core Laboratory



The Digital Microscopy Core operates and maintains computer controlled microscope workstations ranging from light to electron microscopy. We offer advice, training and user support for equipment operation (e.g., 3D SIM, PALM, CLEM, TEM) and sample preparation such as chemical fixation of cell culture and tissue samples.

We also provide a range of sample preparation equipment for electron microscopy including a Leica high pressure freezer and freeze substitution units and a FEI Vitrobot unit for plunge freezing of samples. A Leica UC7 ultramicrotome is available for plastic sectioning for electron microscopy. Thick sections are cut with glass knives for electron tomography. There is a Leica UC7 for cryosectioning. We support negative staining and cryo-electron microscopy approaches to protein structure.



Poster #6

Translational Pathology Shared Resources: Tissue Biorepository and Procurement Service



The UAMS Tissue Biorepository and Procurement Service (TBAPS) is a repository of human specimens accessible to the UAMS research community. We have an IRB approved protocol and general consent form that allows us to consent patients, acquire samples from the pathology grossing room, and provide these samples to researchers who have appropriate approval. Solid tissues and fluid specimens (serum or urine) are stored in liquid nitrogen tanks. Solid tissues may also be embedded into paraffin. Our specimen collection has over 12,000 tissue samples along with de-identified sample related pathology data available from a variety of organs and an extensive list of diagnoses. Researchers may browse the collection of specimens using an online database management software (CaTissue) to search donor demographics, diagnosis, and/or other sample-related data to identify and request specimens of interest.

Poster #7

Helen L. Porter and James T. Dyke Brain Imaging Research Center



The BIRC is a neuroscience and neurotechnology resource for the PRI, College of Medicine, UAMS, and the state of Arkansas. The long-term goal of the BIRC is to conduct human neuroscientific research that has the greatest potential to improve the treatment of psychiatric disorders and prevent illness in at-risk individuals. By doing so, the BIRC provides novel insights into the biological bases of mental health, enhances patient education on the causes of mental illness to promote a greater expectation of recovery, and guides the development of more effective treatment approaches. Seeking explanations at the neural network level, the BIRC seeks to provide clinical neuroscience with a better understanding of the causes of mental illness and the specific brain responses to medication and behavioral therapies. Examples of the BIRC's broad collaborative service to UAMS include identifying predictors of treatment response among candidates undergoing neurostimulation for treatment of tinnitus or Parkinson's Disease (Dept. of Neurosurgery), mapping the neural mechanisms underlying nonpharmacological approaches for managing chronic pain (College of Nursing), and modeling neuroplasticity with successful treatment of aphasia (College of Health Professions).



Poster #8

Bioanalytical Core



Using modern analytical instrumentation (e.g., LC-MS, GC-MS), the Bioanalytical Core offers high-throughput analytical services for determining diagnostic amino acids and their precursors or metabolic products. Available biomarkers include citrulline and tetrahydrobiopterin. Determination of other small molecules is possible, but fees will be assessed for the cost of method validation. The Bioanalytical Core can provide analysis of pharmacokinetic samples and subsequent determination of pharmacokinetic parameters. The Bioanalytical Core, in support of preclinical drug development or Phase 1 clinical trials and gathered in compliance with 501(a) (2)(B) of the FD&C Act, can provide bioanalytical data for Investigational New Drug (IND) applications.

