



Emory Core Day

April 17, 2015

WHSCAB Plaza



Learn what's available
to support your research.



EMORY





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#1

Integrated Cellular Imaging (ICI)

ICI is jointly managed by Emory University School of Medicine and the Winship Cancer Institute

Our goal is to provide outstanding service and access to advanced optical imaging microscopes and software at Emory. ICI strives to unite diverse microscopy interests across Emory's campus, providing investigators the opportunity to share ideas, expertise, and instrumentation.

Services

- Basic and advanced training on all equipment and software
- Guidance in experimental design and assay development
- Assisted microscopy sessions
- Sample preparation and analysis

Microscopes

- 5 Point Scanning Confocals
- 2 Live Cell Confocal Imaging Systems (spinning disc, A1R resonant scanner)
- 2 Multi-photons (intravital, tissue, cell culture)
- 1 TIRF Microscope
- 2 Super-resolution microscopes (N-SIM, OMX Blaze)
- 3 Image Analysis Workstations (deconvolution, quantitation)
- 2 Widefield Fluorescence Scopes
- 1 Roche xCelligence
- 1 Fluorescent whole animal imaging station

ICI Directors

Adam Marcus, Ph.D., Director

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Alexa Mattheyses, Ph.D., Associate Director

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Visit us at: <http://ici.emory.edu>

Reservations: <https://ppms.us/emory>

General inquiries: ici@icicore.com



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Integrated Cellular
Imaging Core

Emory Integrated
Core Facilities



#2

Microscopy in Medicine (MiM Core)

<http://medicine.emory.edu/MIMCore>

The **Microscopy in Medicine (MiM) Core** was established in 2000 as a core facility providing access to state-of-the-art imaging instrumentation and technologies on a shared-use basis to faculty, staff and students of the Division of Cardiology and Department of Medicine in the Emory University School of Medicine. The facility is located in the Woodruff Memorial Research Building (WMB), and houses the following microscopes:

Laser Scanning Confocal Microscopes

- **Zeiss LSM 510 META** confocal laser scanning microscope in WMB 30
- **Leica TCS SP5 II** confocal microscope with tandem scanner (conventional and resonance) and HyD detectors located in WMB 1011

Brightfield and Widefield Fluorescence Microscopes

- **Zeiss Axioskop** microscope equipped with bright field and fluorescence optics and an **AxioCam** camera in WMB Room 303
- **Zeiss Axioskop** microscope equipped with brightfield and fluorescence optics and an **RT Slider Spot** camera in WMB Room 303
- **Olympus IX71** microscope equipped with phase contrast and fluorescence optics and an **Olympus DP71 camera** in Room WMB 303

Histology Equipment:

WMB 301 houses a fully equipped laboratory for processing of histological samples, including paraffin/frozen tissue embedding, sectioning, staining and immunohistochemistry using both chromogenic and fluorescence markers. The equipment includes:

- **Leica CM3050 cryostat**
- **Shandon FSE cryotome**
- **Leica RM2035** and **RM2235** microtomes
- **Leica EG1160** Tissue Embedding Station
- **Leica TP 1020** Automatic Tissue Processor with vacuum
- Basic supplies and reagents for histology in **Labconco Protector Work Station**

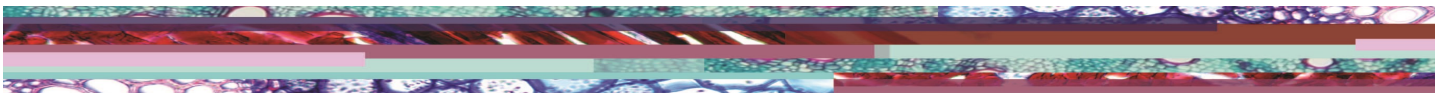


Image Processing and Analysis Software:

The MiM Core has the following software available on workstations in WMB 306 for the processing, analysis, and 3-D volume rendering of images and for the preparation of images for publication:

- **Bitplane Imaris Suite 6.3.1** (site license on Emory server) for 3D and 4D real-time interactive image visualization of 3D multichannel images, including volume and surface rendering, tracking of objects in 3D images over time and colocalization of multiple fluorescent probes in 3D and 4D images
- **Media Cybernetics Image-Pro Plus v. 6.2** with extensive enhancement, measurement and customization tools
- **Media Cybernetics AutoDeblur** for deconvolution of Z stacks acquired by confocal microscopy
- **Zeiss ZEN 2011**
- **Leica LAS AF**
- **Adobe Photoshop CS3 Extended, Adobe Photoshop Elements 6.0, Adobe Illustrator CS3 and Adobe Acrobat 8 Professional** for preparation of images for publication

All potential users of the systems are asked to contact the director of the facility, **Dr. Lula Hilenski**, at 404-727-8116 or lhilens@emory.edu to schedule a one-on-one Basic Training session at a mutually convenient time. These individual training sessions, which usually last about 2 hours, include proper use and care of microscope objectives, operation of the microscope and laser system, laser safety, as well as how to acquire, save, export and transfer images.



#3

Robert P. Apkarian Integrated Electron Microscopy Core

The Robert P. Apkarian Integrated Electron Microscopy Core is a university wide research core located in Cherry Logan Emerson Hall on the Emory University campus.

The RPAIEM Core provides investigators from all areas of the university with instrumentation, technical assistance, and training in transmission and scanning electron microscopy. The facility produces high quality work and offers flexible accessibility to meet researchers' needs for both small and large research projects.

The facility operates on a "first come, first serve" basis, although projects with grant or publication deadlines may be prioritized. The RPAIEM Core welcomes investigators from other universities and industry.

Services Offered:

- ◆ Conventional TEM & SEM imaging of biological and materials science specimens.
- ◆ Cryo-high resolution TEM & SEM imaging of frozen-hydrated specimens
- ◆ Conventional light microscope imaging
- ◆ Standard EM & LM sample embedding
- ◆ Standard ultrathin and semithin microtomy
- ◆ Cryo-ultramicrotomy
- ◆ Negative staining
- ◆ High pressure freezing, plunge freezing, and self pressurized rapid freezing.
- ◆ Cryo-substitution and embedding
- ◆ Ultrathin metal film coating
- ◆ EM and LM enzyme-cytochemistry
- ◆ EM and LM immunocytochemistry

Contact Information

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Visit us at:

http://med.emory.edu/research/core_labs/microscopy/index.html



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**Robert P. Apkarian Integrated
Electron Microscopy Core**
Emory Integrated Core Facilities



#4

CSI-BITC Service Center

The Center for Systems Imaging (CSI) and The Biomedical Imaging Center (BITC) are a single imaging Core Services Center (CSI-BITC) within Emory School of Medicine.

CSI is a cross-disciplinary scientific, administrative, and educational home for imaging science at Emory. The center is housed in a 17,000 square foot newly-renovated facility on the 2nd floor of the Wesley Woods Health Center Building and is home to thirty-six faculty, post-docs, students and staff.

BITC is a research center of the Wallace H. Coulter Department of Biomedical Engineering, a joint department of the Georgia Institute of Technology and Emory University. BITC is housed in a total of 2,400 square feet between Emory University Hospital (EUH), Whitehead Biomedical Research Building (WBRB), and the Health Sciences Research Building (HSRB) and is home to seventeen faculty, post-docs, students and staff.

The combined Center's goals are to:

- ◆ Support the advancement of scientific research in biomedical imaging
- ◆ Provide imaging services to researchers in and around the Emory community
- ◆ Provide interdisciplinary educational symposia and training programs.

The major imaging equipment located at CSI-BITC include:

- ◆ Siemens RDS 111 multiport, self-shielded, automated cyclotron producing a 11 MeV, 50 μ A proton beam
- ◆ radiochemistry laboratory for radiotracer research and production
- ◆ Siemens high resolution (2 mm) PET/HRRT human brain scanner
- ◆ two Siemens 3.0 Tesla MRI full body scanners
- ◆ Inveon micro PET-CT animal scanner
- ◆ high field Bruker BioSpec 94/20 9.4 Tesla animal scanner
- ◆ Maestro multispectral fluorescence animal imaging system
- ◆ MRI Simulator for pediatric MRI study subject training
- ◆ Vitronic 3-D body imaging scanner.

CSI-BITC's investigators routinely collaborate with researchers from the Emory departments and divisions, who use CSI-BITC's Core imaging services in their clinical studies. The Center is able to draw on the expertise available within the greater Emory community, as may be required in performing new medical procedures in accordance with standard of care or in developing new measurement or analytical methods needed for a study.



5

Cardiovascular Imaging Research Core at Pediatrics

The Cardiovascular Imaging Research Core (CIRC) at Children's Healthcare of Atlanta, Egleston Campus serves as a solely research- focused center, independent from the standard clinical operations. The CIRC core lab provides high quality, non-invasive cardiac imaging support for investigators involved in clinical research involving infants, children and adolescents in a dedicated research setting. Dedicated space, equipment and staff have experience transcending innovation by utilizing imaging modalities and techniques not typically seen in the clinical arena for clinical and basic research using echocardiography and vascular ultrasound.

CIRC website is

www.pedsresearch.org/cores/detail/cardiovascular-imaging-research-core-circ

Services offered by CIRC:

Echocardiograms

- Transthoracic Echocardiography
 - ◇ 2-dimensional (2-D) echocardiography
 - ◇ Color and spectral Doppler echocardiography
 - ◇ M-Mode echocardiography
 - ◇ Tissue Doppler Velocity Imaging
 - ◇ Real-time 3-D Imaging
- Strain and Strain rate imaging
- Transesophageal Echocardiography
- Fetal Echocardiography
- Stress echocardiogram

Exercise stress testing

Electrocardiograms

Vascular function assessment:

- Carotid intimal medial thickness (cIMT)
- Brachial flow mediated dilation (FMD)
- Applanation tonometry

Cardiac magnetic resonance imaging

Consultative expertise for protocol development

Post-processing of previously acquired images

Contacts:

Medical Director: Ritu Sachdeva, MD (sachdevar@kidsheart.com)

Senior Research Coordinator: Heather Friedman, MPH (heather.friedman@choa.org)

Imaging Scientist: Senthil Ramamurthy, MS (senthil.ramamurthy@choa.org)



6

Emory Integrated Genomics Core (EIGC)

The **Emory Integrated Genomics Core** (EIGC, <http://eigc.emory.edu>) consists of three divisions, which each provide unique services to Emory clinical and basic researchers. The central mission of the EIGC is to provide a top-tier genomics resource that is widely available to the Emory research community and that integrates cutting-edge genomics technologies with downstream analyses. The **CLIA Division** (CLIA ID Number: 11D1086150). provides nucleic acid isolation services and support for clinical trials research using genomics technologies that need to be conducted in a CLIA certified environment with CLIA validated protocols. The **Research Division** provides a wide variety of genomics services to include nucleic acid isolation, microarray-based gene expression and genotyping, and next-generation sequencing (NGS). Using an innovative NGS broker model, the EIGC outsources next-generation oligonucleotide sequencing to academic and commercial entities, with the ultimate goal of obtain the lowest cost, highest quality, fastest turn-around for our customers. The **Computational Division** oversees a 1 Petabyte storage array where large data files can be placed for analysis. We also act as the main customer support for the TARDIS HPC cluster, which enables investigators to process large computational jobs in parallel. Using this infrastructure, the EIGC offers innovative, tailored genomics services for investigators, while also allowing tighter integration with existing biostatistics/bioinformatics service centers at Emory.

Contact Information

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Contact us at: eigc@emory.edu

Visit us at: <http://EIGC.emory.edu>

Talking about genomics is easy...
...but effectively using genomic technologies is more challenging.

Our mission: Help you use genomics in your research.



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Emory Integrated
Proteomics Core

Emory Integrated
Core Facilities



#7

Yerkes Non Human Primate Genomics Core (GenCore)

The mission of the Yerkes Non Human Primate Genomics Core is to provide researchers at the YNPRC, Emory Vaccine Centre and greater Emory community with access to cutting edge high throughput genomic technologies including NextGen sequencing and microarray. The GenCore offers diverse set of assays, including NextGen sequencing applications: RNAseq, targeted resequencing, ChipSeq, Single Cell Genomics, microbiome sequencing and miRNA sequencing. The GenCore provides researchers with 'start-to-finish' service, assisting in assay design, sample preparation, quality assessment, data analysis and bioinformatics support. Ongoing projects in the GenCore laboratory include gene expression profiling of several pre-clinical HIV vaccine candidates, transcriptomic analysis of multiple primate malaria species, targeted sequencing of multiple genomic regions for their effects on behavior, and comparative miRNA analysis.

For more information please contact:

Co-directors:

Dr. Zach Johson zpjohns@emory.edu 404-727-1832

Dr. Steven Bosinger steven.bosinger@emory.edu 404-727-7216

#8

Emory Integrated Proteomics Core

PURPOSE:

The goal of the Emory Integrated Proteomics Core is to provide protein analytical services by cutting-edge mass spectrometry (MS). The main technology platform is liquid chromatography coupled with tandem mass spectrometry (LC-MS/MS) for highly sensitive protein identification, posttranslational site mapping, and protein quantification. Numerous computational tools have also been developed for high throughput data processing. Our priority is to serve the needs of investigators at Emory University, but we are capable of serving outside users as well.

SERVICES:

1) Protein Identification. The most common service provided by the core is the identification of unknown protein in a sample. In the typical experiment, protein samples of unknown sequence are resolved by 1D SDS-PAGE and enzymatically digested (e.g. trypsin) and analyzed by LC-MS/MS.



2) Defining Protein-protein Interactions with Co-immunoprecipitation and LC-MS/MS. Co-immunoprecipitated proteins that interact directly or indirectly with the target protein are analyzed by LC-MS/MS. No prior knowledge of the likely interacting partners is required and as such it is possible to capture and identify the entire protein complex or “interactome” out of solution thereby identifying unknown members of the complex.

3) Analysis of Post-Translational Modifications (PTMs) of Proteins. The proteomics core has the methodologies in place and documented examples of successfully analyzing the common post-translational modifications (PTMs) such as phosphorylation, ubiquitination, methylation, acetylation, hydroxylation, **Met/Cys(S-oxidation)**, **Cys-succination** and limited proteolysis processing.

4) Quantitative Comparative Proteomics. Protein/peptide quantification from cells or tissue can be achieved based by metabolic/chemical labeling (SILAC, ICAT, ITRAQ, TMT tags), extracted ion current, or spectral counts.

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**Emory Integrated
Proteomics Core**

Emory Integrated Core Facilities



#9

Emory Research and Health Sciences IT Service Center

The Emory Research IT Service Center at Emory University supports research investigators across the enterprise with a variety of tools and services provided through the Service Center Services including reusable electronic data capture (eCRF) tools, data extraction from clinical data sources, data modeling, software development, database management, database hosting and high performance computing. The Service Center has partnered with Emory University Technology Services to provide secure, HIPAA compliant data storage and system hosting to ensure the appropriate level of data security and access control. Project management and review processes ensure that the right resources are applied to tailor the solution to the need.

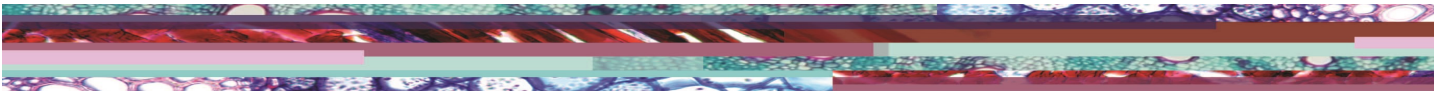
Data Extraction, Analysis and Management - The Data Analysis Service is a resource for the researchers who want to extract and analyze information from the Clinical Data Warehouse or other data sources. R-WIT employs a team of analysts who work with researchers to define specific data needs and create a strategy for delivering data on a one- time basis or for recurrent data needs as appropriate.

Services include:

- aggregate population queries for pre-research
- de-identified clinical data extraction
- defining cohort populations for retrospective studies or patient recruitment
- extraction of clinical information for current study populations
- assisting with migrating clinical data to research data repositories
- assisting with IRB and medical record clearance for data use

Electronic Data Capture - The Research IT Service Center hosts an instance of the Research Data Capture (REDCap) system developed by Vanderbilt University. The system is hosted on virtual machine infrastructure and backups are created nightly and stored securely at an Emory managed offsite facility. The service center supports research investigators with simple hosting of studies or consultation services including study configuration, data extraction and analytics.

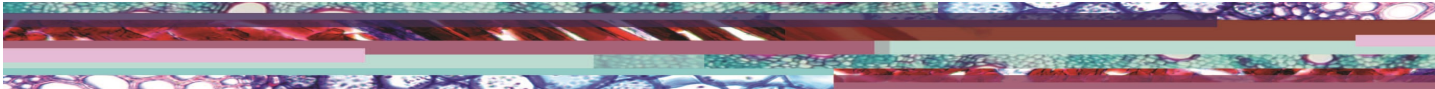
Software Development – The service center provides software development services for a wide range of application needs including research administration, clinical study management and basic science. The team of developers works with the Emory University Enterprise architecture group to reuse and implement enterprise software development patterns and architectures to provide standard development practices and efficiency across applications. The development group is lead by an assistant director for software development with multiple lead developers reporting to the assistant director. Each lead is responsible for



one or more application designs and provides direction and mentoring to junior developers. The service center software development methodology includes several roles including project managers, business analysts, software developers data modeler, database administrators and quality assurance analysts. The size of the team is determined based on application scope and complexity. Requirements are captured using standard templates and use case models are developed for each application. Project managers use industry standard techniques and tools to ensure proper tracking and reporting of project progress, issues and milestones.

Nautilus Laboratory Information Management System (LIMS) - The primary system used for cataloging and management of specimen information will be Nautilus LIMS. Nautilus LIMS is a system that is well suited for workflow automation and information tracking related to sample management and processing. Emory University and the Atlanta Clinical and Translational Science Institute (ACTSI) selected the system after a nine-month evaluation that included many stakeholders across Emory and the ACTSI. The initial license purchase and implementation are supported by ACTSI and Emory University funds and the system is currently utilized eight laboratories across Emory and the ACTSI. The Emory/ACTSI solution uses the base Thermo Fisher Scientific Nautilus LIMS along with a number of vendor developed extension modules to provide a high quality solution for a diverse set of laboratories. The LIMS is accessible from multiple organizations and physical networks, provides powerful and intuitive configuration tools, supports integration with other research systems via web services and includes features that support workflows related to bio-repository and research laboratory functions. Emory and the Thermo Fisher teamed to create the Study Design Module (SDM), which provides an easy to use graphical user interface for study design. The module uses metadata tables to store study attributes including groups, visits, draws and actions that dynamically control a set of default workflows. The SDM makes it possible for users to quickly design integrated workflows spanning: protocol generation, participant enrolment, sample submission and acquisition, and result reporting. The Emory/ACTSI LIMS is offered as an on-site HIPAA compliant hosted service by the Emory Research IT Service Center. The hosting environment is a physically secure server operations center with 24 x 7 monitoring, and environmental sensors and controls. Professional system administrators maintain and operate the servers and are responsible for ensuring performance, uptime, and system maintenance, including security and application-layer patching. In addition, the services comply with Emory University information security practices and controls.

High Performance Compute Cluster: The TARDIS cluster, a 768 CPU-core high performance supercomputing cluster, was acquired by Emory in the Fall of 2013 and is housed at Georgia Tech's primary data center. It is managed by the High Performance Computing Group within R-WIT in collaboration with scientific centers, investigators, and service cores. Policies and rates for use of TARDIS are established by the Executive Committee of the Emory High Performance Compute Cluster (EHPCC).



TARDIS is a high-performance supercomputing cluster with an estimated throughput of 5 teraflops. It is a loosely-coupled cluster designed primarily for serial/batch processing. The cluster consists of AMD Opteron-based systems connected via a carrier-grade gigabit ethernet switch, with a 40 TB GPFS parallel file system used for computational space. Torque and MOAB are used for managing jobs.

TARDIS was designed as a general use cluster, and has been tuned to perform optimally on jobs varying across a number of disciplines with both large and small data sets. Access to the cluster is granted to Emory-affiliated PIs based on a CPU/hour charge model.

#10

Winship Biostatistics and Bioinformatics Shared Resource

The Winship Biostatistics and Bioinformatics Shared Resource (BBISR) is staffed by 10 members (four PhD faculty with primary appointments in the Department of Biostatistics and Bioinformatics at the Rollins School of Public Health, two PhD staff, two MS-level staff, and one Administrative Assistant). We provide service and collaboration in clinical, laboratory, population and molecular cancer study design and analysis. We are a shared resource defined by a **TEAM-based approach** in which we are Thoughtfully Engaged to obtain Accurate results, while being Mindfully aware of their context to the cancer type and deadlines for their execution. Our core 'deliverable' is a report that includes detailed information to address manuscript preparation, grant submission, and presentation preparations by providing details on the methods, results and their interpretation, in addition to tables and figures of poster quality. During calendar year 2013, BBISR members provided service and collaboration to 130 users with a total of 644 requests that included 67 grant submissions, resulting in 51 accepted or published manuscripts.

For more information, visit our website:

<https://bbisr.winship.emory.edu>.

To place an online service request, visit

<https://apps.winship.emory.edu/winshipbbisr/signin.php>.



#11

Biostatistics Consulting Center (BCC)

Department of Biostatistics and Bioinformatics

Rollins School of Public Health

The Biostatistics Consulting Center (BCC) offers comprehensive statistical consultation and collaboration for Emory faculty and research staff. BCC services include preliminary study design, development of data management and analysis plans, data analysis, and statistical assistance in preparation of manuscripts and publications. In addition, the BCC provides support for basic database development for new and ongoing projects. The BCC operates on a task-based fee structure and can be supported through research funds or through limited pilot project support from the School of Medicine.

Interested investigators work with the BCC Director to evaluate the request and establish a detailed Statement of Work outlining expectations, data requirements, deliverables, and due dates. Typical projects are focused, short in duration (less than 6 months), with clear deliverables. BCC projects often provide the basis for ongoing research collaborations for future proposals and projects.

Past projects include data analysis for publications/presentations, pilot data analysis for grant preparation, sample size calculations, database development, questionnaire design, data management plans for multi-center research projects, and data analyses of archived data.

For more information or to initiate a project, please contact the BCC Director, Dr. Lance Waller, lwaller@emory.edu, 404-727-1057.



#12

Atlanta Clinical & Translational Science Institute (ACTSI)

www.ACTSI.org

To strengthen and accelerate the process of bringing scientific discoveries to the community, the Atlanta Clinical & Translational Science Institute (ACTSI) and its partners Emory University, Morehouse School of Medicine, and Georgia Institute of Technology, strive to remove roadblocks and ease challenges in clinical and translational research. ACTSI programs provide investigators with support in the following areas:

- A variety of **funding opportunities** to support innovative research projects, events, and community-based organizations
- Over 30 dedicated **clinical research units** throughout metro-Atlanta with specialized staff and resources
- **Training and career development** for the next generation of clinical and translational scientists
 - ◇ Master of Science in Clinical Research
 - ◇ KL2 Mentored Clinical and Translational Research Scholars Program
 - ◇ TL1 Pre-doctoral Medical Scientist Training Program
 - ◇ Certificate Program in Translational Research
- **Regulatory** strategies and submission assistance
- Research participant **recruitment** assistance
- Sophisticated **equipment** that transcends specific research areas
- Expertise, problem solving, and consultation in – **ethics, biostatistics, epidemiology, research design, biomedical informatics, pediatric research, clinical trials, and community engagement**



Atlanta Clinical & Translational Science Institute



#13

Translational Testing and Training Laboratories, Inc. (T3 Labs)

Pre-clinical Research

Translational Testing and Training Laboratories (T3 Labs) is a pre-clinical research institute operating a **GLP compliant, AAALAC accredited** facility. T3 Labs' mission is to advance the development of innovative therapeutics by providing exceptional quality work to industry and academic collaborators in the biomedical research field.

Emory University is dedicated to facilitating T3 Labs' mission by offering access to research expertise and leadership in translational science. Following the Emory/Saint Joseph's Joint Operating Company announced in 2012, T3 Labs remains a separate non-profit entity that will continue to carry out high-quality pre-clinical studies.

Services

- Pre-clinical testing for medical devices, pharmaceuticals, and biologics
- GLP and non-GLP studies
- Protocol and model development for acute or chronic studies

Facility

- State-of-the-art, 32,000 square-foot facility
- GLP compliant, AAALAC accredited
- fully equipped OR/Cath labs and 1 digital Cath lab
- Located 15 minutes from the Atlanta airport

Equipment

- Philips Allura Xper FD10, GE 9900, and 9800 OEC C-Arms
- Echo, TEE, TTE, OCT, IVUS, Digital X-Ray
- Micro-CT and Mobile MRI and CT
- Additional equipment can be sourced





#14

Emory Personalized Immunotherapy Center (EPIC)

The Emory Personalized Immunotherapy Core (EPIC) is located within the premises of Emory University Hospital Blood Bank. Our mission is to render accessible cutting edge, innovative personalized cellular pharmaceuticals for catastrophic illnesses. With financial sponsorship from Emory Healthcare, we have refurbished a 300 ft² clinical-grade, fully equipped, high sterility isolation facility. It is designed as an enabling infrastructure to support early phase clinical trials of cell-based therapies where processing of human cell and tissue is required as part of a FDA-sponsored biopharmaceutical study. The facility is manned by a team of highly qualified personnel dedicated to the successful implementation and prosecution of personalized cellular medicine clinical trials. The purpose of this designated Core facility is to directly support investigator-driven Phase I cell therapy clinical trials at Emory with an emphasis on novel therapies considered to be first-in-human, first-in-Georgia and first-in-child. As a Core facility, EPIC provides a unique resource to the Georgia research community in assisting the translation of cellular therapies from the bench side to the clinic. The facility possess the necessary infrastructure to manufacture cellular therapies under FDA approved good manufacturing practices (FDA cGMP Phase I guidance July 2008) and can provide resources and services to facilitate pre-clinical studies.

Contact Information

Ian Copland, PhD, Director

ian.copland@emory.edu

Visit us at:

http://med.emory.edu/research/core_labs/epic/index.html



#15

Flow Cytometry Core

The Emory School of Medicine Core Facility for Flow Cytometry provides analysis and sorting services to the research community in and around the Emory University Campus. We offer interactive training sessions and consultation services.

Training & Consultation

Train To Utilize Analyzers Within Our Facility:

- Contact us to sign up for a training session
- Bring Over Your Stained Cell Samples For Analysis
- Learn basics concerning electronics, fluidics, & optics of the instrument
- Become familiar with basics of compensation
- After initial training session, sign up to utilize the analyzer at your convenience
- We are available for assistance & troubleshooting

Cell Sorting

- Contact us for consultation & to sign up for a sort
- Review the “Guide For Getting A Great Sort” on our homepage
- Meet us in the sorter lab!

Contact Information

Rafi Ahmed, PhD, Core Director

Robert Karaffa, Technical Director

rkaraff@emory.edu

Sommer Durham, Flow Cytometry Technician

sdurha4@emory.edu



#16

Flow Cytometry Core at Pediatrics

The Pediatric Flow Cytometry Core provides cytometry services for the analysis and sorting of cells as well as expert consultation for experimental design and planning. The Flow Cytometry Core offers access to several state of the art analytical flow cytometers as well as high-speed cell sorting. Training and technical expertise are available to enable our users to improve the quality and scope of their research. Contact Aaron Rae for questions and to set up training. The Flow Cytometry Core also offers immunological-based assay services and consultation. Karnail Singh may be contacted for questions and to set up training for the immunological based assays.

The core has the following instruments available:

IMAGESTREAM^X MK II

This analyzer combines flow cytometry with high resolution microscopy. The system supports bright field, dark field and up to 9 fluorescent images of all cells in the flow stream and is suitable for multiple applications.

BD FACS ARIA II 15-color Cell Sorter (2B, 5YG, 5V, 3R)

The FACS ARIA II is capable of sorting up to four populations at once into various collection devices (15mL Tubes, 5mL Tubes, 96-well plates and custom types by request). Various nozzle sizes and sheath pressures can be used to optimize your cell sorting experiment.

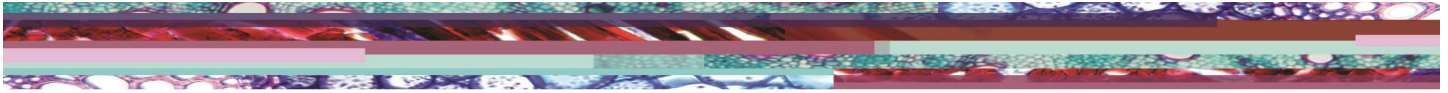
Our FACS Aria II is equipped with 4 lasers (405nm, 488nm, 561nm and 640nm) and can measure up to 15 different fluorochromes at once.

BD FACS Jazz 6-color Cell Sorter (BSL-2+)

The FACS Jazz is a brand new developmental cell sorter that can sort up to two populations at once and into various collection devices (5mL Tubes, multi-well plates). It also has the ability to do 96-well plate index sorting. This instrument is housed in a biosafety cabinet for infectious Human Cell Sorting.

AutoMacs Pro (Magnetic Cell Separator)

The AutoMacs Pro Separator is an automated magnetic cell separator used for cell isolation and enrichment. The AutoMacs can process up to six samples automatically, ranging in volumes from 0.2 mL to 50 mL. Preset cell separation programs allow positive or negative selection of magnetically labeled cells using MACS columns. Cell separation programs are chosen based on levels of antigen expression and desired levels.



2x BD LSRII 15-colour Analyzer (2B, 5 YG, 5V, 3R)

Both LSR II's are equipped with 4 lasers (405nm, 488nm, 561nm and 633nm) and can measure up to 15 different fluorochromes at once.

BD Canto II 8-colour Analyzer (4B, 2V, 2R)

The Canto II is equipped with 3 lasers (405nm, 488nm and 633nm) and can measure up to 8 different fluorochromes at once.

Luminex 100/200

The Luminex 100/200 System enables the users to multiplex (simultaneously measure) up to 100 analytes in a single microplate well, using very small sample volume (~50 ul). The system delivers fast and cost-effective bioassay results on many assay formats including RNA expression assays, receptor-ligand assays and immunoassays for cytokines and other secreted molecules in serum/plasma and other body fluids.

#17

Rodent Behavioral Core

The School of Medicine Rodent Behavioral Core provides planning, execution, and analysis of behavioral experiments examining activity, arousal, coordinated movement, learning and memory, anxiety, depression, seizure susceptibility, reward/reinforcement, and aggression in mice and rats. Additional tests can potentially be developed on a case-by-case basis. The Behavioral Core also offers several rodent surgical services and assistance in IACUC protocol preparation. Directed by Jason Schroeder, Ph.D. and David Weinshenker, Ph.D., the Core is located in the vivarium of the Whitehead Biomedical Research Building.

For more information contact

Jason Schroeder, jschroeder@genetics.emory.edu

(404) 309-8133.

#18

Transgenic Mouse & Gene Targeting Core

The Transgenic Mouse and Gene Targeting Core Facility's (TMF) mission is to provide outstanding service in generating and preserving genetically-engineered mouse models and to transfer existing mouse alleles on or off campus. To do so we possess both state of the art equipment along with deep expertise for the generation of transgenic and knockout or knock-in mice to study gene function in mouse models, as well as to cryopreserve genetically-engineered mouse models in order to facilitate allele transfer among Institutions.

With our proven expertise and strong success record, the core provides a full range of services including:

- **CRISPR/Cas9 Injection**, Gene editing via Crispr/Cas RNA microinjection into 1-cell embryo
- **Transgenic mouse production**, BAC or plasmid microinjection into fertilized embryo
- **ES Cell Targeting**, transfection of DNA into ES cells for the generation of recombinant ES cell clones
- **Generation of gene knockout or knock-in mice**, injection of targeted ES cell clones into host blastocysts
- **In Vitro Fertilization (IVF)**, often the fastest cheapest method to import an existing strain
- **Cryopreservation of mouse embryos or sperm**, includes 30 years of storage
- **Rederivation of alleles**, via embryos or sperm
- **Teratoma Formation Assays** to validate iPS cell lines

The facility also provides a wide range of consultation on experimental design and vector construction as well as genomic DNA preparation from recombinant ES clones and mouse tail biopsies, mouse husbandry and breeding.

The Mouse Core supports numerous research activities on and off campus. The Core is located in the Health Sciences Research Building (HSRB), where the animal facility is strictly maintained in both a Virus and Antibody Free (VAF) and Specific Pathogen Free (SPF) environment. For more information on services or contact, please visit the Core web site: <http://med.emory.edu/mousecore>





#19

Cancer Animal Models Shared Resource at Winship

Location: Emory Clinic B, third floor Laboratory 3113, at Winship Cancer Institute of Emory University.

Director: Melissa Gilbert-Ross, PhD

Laboratory Staff: Walter 'Guy' Wiles, MS

The current mission of CAMS is to assist investigators in the development, characterization and analysis of appropriate animal models for cancer research. Currently, the main emphasis and expertise of the facility lies in the use of complex genetic mouse models. The core acts as a resource for investigators by:

- Assists in the acquisition, breeding, and initial characterization of animal models from external sources including both PIs and resources such as The Jackson Laboratory, and the NCI Mouse Models of Human Cancers Consortium (MMHCC).
- Provides state-of-the-art technologies and superb technical expertise in a centralized location.
- Flexibility in experimental design to meet the needs of individual investigators in regard to planning and executing cancer model studies, and full service “hands on” monitoring, report generation, and analysis of tumor development
- Assistance in grant preparation and in IACUC protocol submission.

Service Provision Categories:

- Provision, Breeding, Colony Maintenance and Genetic Screening of animals.
- Provision of optical imaging modalities (including an in-house IVIS Spectrum for bioluminescence and fluorescence optical imaging, access to multiphoton analysis from within the Integrated Cellular Imaging (ICI) Core, and guidance for obtaining microCT/PET imaging through the Quantitative BioImaging Laboratory housed in the Emory University School of Medicine) for both genetic and xenograft model systems.
- Drug treatment and health status monitoring for longitudinal tumor studies.
- Customized surgeries such as cranial window placement for longitudinal monitoring of brain cancer xenograft models.
- Specialized services such as cell line generation, provision of reporter lines, and development of specific experimental programs based on investigator needs.



<https://winshipcancer.emory.edu/research/WinshipContentPage.aspx?nd=698>



#20

Animal Physiology Center at Pediatrics

The Animal Physiology (AP) Core is supported by the Emory+Children's Pediatric Research Center and is directed through the Heart Research and Outcomes (HeRO) center. The AP Core is a service center and offers acute and survival surgery to create disease models using small animals, such as rats and mice. Options include using our trained surgical staff to perform procedures or we will provide access to the surgical equipment for laboratories to perform their own procedures. We are located in ECC 260. Surgical procedures available include:

- Pulmonary artery or aortic banding to create heart failure
- Myocardial infarction or cardiac ischemia/reperfusion
- Liver ischemia/reperfusion
- Tail vein injections
- Chronic kidney disease modeling by 5/6 nephrectomy

In addition, we are happy to assist with the development of additional disease models.

Equipment available includes: small animal ventilators, cautery, temperature monitoring, pulse oximeter, isoflurane anesthesia systems, and dissecting microscope with fluorescence.

The AP core also offers high-resolution (30 μm) *in vivo* imaging ideally suited for small animals such as mice and rats. The Visualsonics Vevo 2100 system includes 4 microscan transducers to meet a wide variety of imaging needs. Each MicroScan transducer consists of a 256-element array and delivers a usable frame rate of 300-400 frames per second depending on the transducer type. Each transducer can have up to three focus depths that can be adjusted to acquire the optimal image. All VisualSonics transducers can be used to acquire two modes to be viewed simultaneously. Ultrasound examinations can be used to characterize cardiac function and liver and kidney blood flow as well as tumor and vascular imaging. In addition, we offer ultrasound guided injections for noninvasive, targeted delivery of therapies such as cell or nanoparticle therapies. Studies can be conducted for you by our trained staff or investigators can reserve the equipment and utilize their own laboratory personnel. We are happy to work with investigators to optimize their experiments. Equipment and modalities include: Visualsonics Vevo 2100 Ultrasound System, integrated isoflurane-based anesthesia system, B-Mode and M-Mode cardiac imaging modalities, Pulsed-Wave and Color Doppler modes, contrast imaging functionality, and strain imaging for cardiac mechanic measurements.

Subsidies are available for pediatric researchers.

Questions:

Please contact

Mary Wagner, PhD

Scientific Director

mary.wagner@emory.edu

404-727-1336

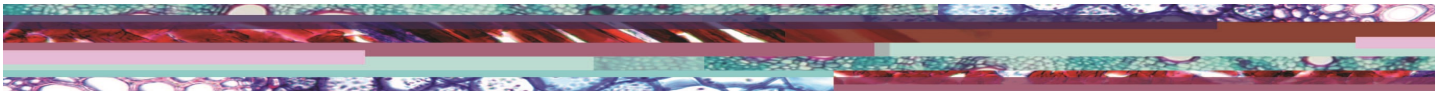
Rong Jiang, PhD

Technical Director

rjiang2@emory.edu

Visit our website at:

<http://www.pedsresearch.org/cores/detail/animal-physiology>



#21

Biomarkers Core at Pediatrics

The **Biomarkers Core** provides state of the art equipment and up-to-date technology to provide high quality analysis of biological samples. This core provides equipment and technical expertise to assay samples using the following methods: high performance liquid chromatography (HPLC) and gas chromatography/mass spectrometry (GC-MS). The Biomarkers Core will work with investigators to develop protocols to analyze their analyte of interest in the fastest turnaround time possible. Current established protocols include analysis of reduced and oxidized glutathione; cysteine and cystine; 60 different aliphatic and aromatic amino acids; metabolites of arginine metabolism; methionine metabolism; poly unsaturated fatty acids; and fatty acids.

#22

Emory Multiplexed Immunoassay Core

The EMIC is located in the Physiology Department on the 6th floor of the Whitehead Biomedical Research Bldg and houses the SECTOR Imager 2400 to run your research or clinical samples for a fee on any of the available MSD kits for Cytokines, Intracellular Signaling, Alzheimer's Disease, Metabolic Markers, Toxicology, Oncology Markers, Bone Markers, Cardiovascular markers, and other inflammatory disease markers.

Custom assay development upon request.

To learn more about MSD Assays & Kits go to: <http://www.mesoscale.com>



#23

Custom Cloning Core Facility

Emory DNA custom cloning core facility is the only one full service cloning core facility in the United States providing excellent custom cloning service at a fraction of industrial rates for Emory users as well as non-Emory clients. Clients of our core facility receive free consultations and can use for free the vector depositarium.

Since 2009 more than 4,000 custom DNA constructs were cloned. This resulted in hundreds of co-authorships and acknowledgments in high ranking journals, including Science, Nature, and Cell, as well as in numerous successful grant submissions by Emory and non-Emory faculties.

We clone

- Mutations/Deletions
- Knockouts/Transgenics
- Epitope tags & Fusion proteins
- Protein expression constructs
- Viral gene delivery constructs
- RNAi & related constructs
- CRISPR genomic modifications



#24

Biomarkers Core at Yerkes

The Biomarkers Core is a service laboratory providing determinations of reproductive function; stress physiology; growth; metabolism; circadian physiology; and neuropeptides, neurotransmitters, and a wide variety of endogenous and synthetic small molecule entities in a range of species from rodents, monkeys and apes, and humans using immunoassay, mass spectrometry and liquid chromatography. We have an established assay menu of more than 100 assays. In addition, the Biomarkers Core validates new assays for investigators to meet the specific aims of their research and serves as an information resource for Center staff and outside investigators on issues related to endocrinology. The laboratory also provides training opportunities for students interested in understanding and learning assay techniques as part of their educational program. We also work with researchers to develop testing strategies for drug and endogenous molecule studies of all types.

Investigators within each of the research divisions at Yerkes, as well as investigators from the Emory campus and around the world use this service. Assays are done for investigators on a per sample charge basis in which the Core recovers costs for personnel, reagents, equipment services contacts and miscellaneous supplies. The Biomarkers Core is located at the Main Station of the Main Building in the Yerkes National Primate Research Center. The laboratory is outfitted with the following major equipment: Sequoia-Turner fluorometer and spectrophotometer, Packard Liquid scintillation counter, Perkin-Elmer Wizard² gamma counter, Molecular Devices plate washers, SpectraMax 340 plate reader, Dionex AS50 HPLC, and a Dionex Ultimate 3000 HPLC. Our mass spectrometry capabilities include a Thermo LTQ-Orbitrap mass spectrometer, Micro AS autosampler, and Thermo MS Pump and a recent addition of a Shimadzu Nexera UPLC coupled to an AB Sciex 6500 triple quadrupole mass spectrometer (NIH/NCRR 1S10OD010757-01) for additional small molecule and peptide quantitation capabilities.

Contact Information:

Zach Johnson, Director

zpjohns@emory.edu

Jonathan Lowe, Lab Manger

jonathan.m.lowe@emory.edu



#25

CF Discovery Core at Pediatrics

The CF Discovery Core utilizes the Cystic Fibrosis Biospecimen Registry (CF-BR) which is a storage bank of several thousand biofluids collected from patients with cystic fibrosis at varying disease states. Patients are consented from both the adult and pediatric clinics at Emory and Children's Healthcare of Atlanta, and may donate samples at each outpatient clinic visit, at their annual visit only (which typically runs long and includes more lab tests), when hospitalized, or any combination of the above. Patients choose which samples they wish to donate upon enrollment. They may donate blood, exhaled breath condensate, sputum/throat swab, nasal scrapes, bacterial isolates, and/or bronchoalveolar lavage (BAL) fluid. Each sample donation is completely voluntary.

Since the creation of CFBR in 2010 and as of early 2015, 446 CF patients (194 adults; 252 pediatric patients) have enrolled in this effort. Among these, 334 patients have donated sample(s) at least once and 215 have donated samples more than once. Furthermore, we collect demographic and clinical data associated with every sample in the registry in order to well-characterize the samples for future research. To date, we have collected 2,558 samples and banked 5,513 aliquots. We are expected to collect 1,000+ samples in 2015.

We believe that these treasured samples may be the keys that will allow our researchers to unlock the mysteries underlying the changes that occur in the lungs of CF patients as the disease progresses.

Please visit our webpage at the link below for more information on how to get access to samples, pricing, and a detailed presentation on the samples currently in the CFBR.

<http://www.pedsresearch.org/cores/detail/discovery-core>



26

Emory+Children's Pediatric Research Center Biorepository

Emory+Children's Pediatric Research Center Biorepository, housed within the Center for Transplantation and Immune-Mediated Disorders, is a three-fold entity catering to investigator initiated, as well as center based and disease based research studies. In our current capacity we serve as a biorepository but are expanding into biobanking as well.

Some of the services offered include:

- Processing and storage of DNA, RNA, Serum, Plasma, PBMCs, Urine and Tissue samples
- Shipping and Receiving of samples to/from external laboratories
- Tracking of samples through LIMS
- Database management through REDCap

Biologic, genetic, demographic and clinical data are collected in association with human specimens. Collection of data and specimens is coordinated with regular care visits for patient participants at the Emory CHOA Clinical Service Specialties Clinics and currently serves as the central resource for recruitment of biorepository subjects. The use of the biorepository is open to investigators at Emory and CHOA, as well as collaborators within and outside of Emory.

Core Leadership and Staff:

CTID Director: Subra Kugathasan, MD

Biorepository Director: Sampath Prahalad, MD, MSc

Biorepository Lead Coordinator: Arthi Vasantharoopan, MS

Biorepository Technical Lead: Jarod Prince

Visit Us At: <http://www.pedsresearch.org/cores/detail/specimen-repository>



#27

University of Georgia
Bioexpression and Fermentation Facility

The Bioexpression and Fermentation Facility (BFF) was established in 1967 and is one of the largest fermentation pilot plants in the Southeast offering a variety of services from recombinant protein production to monoclonal antibodies. The BFF consists of the Fermentation Research Facility, Protein Purification laboratory, Cell Culture Facility and Monoclonal Antibody Facility. These four divisions enable the BFF to provide clients with a comprehensive array of services covering a wide range of biomanufacturing areas. The BFF has the capability to provide expertise and training in the biotech industry from biofuels and other environmentally-friendly products to biomedical technology.

The BFF is located at the University of Georgia, in Athens, GA, occupying approximately 9500 square feet of lab space. The BFF has 23 bioreactors ranging from 1 L to 800 L, with centrifugation and tangential flow filtration available for all reactor sizes in addition to cell homogenization and other downstream processing capabilities. In addition, the BFF has a range of LC units capable of flow rates from 1 mL/min to 800 mL/min, and processing at temperatures from 4 °C to 80 °C. There are 13 staff members with 2 PhD scientists.

In 2014, the BFF completed over 131 discrete projects for more than 40 clients. In addition to providing services to several in-state biotech companies and academic researchers the BFF has served hundreds of clients including organizations in 37 states and six countries. The facility has a solid International reputation for providing fermentation and protein purification services. In addition, significant equipment upgrades have been funded by income from service work as well as government grants. BFF operates under ICH Q10 quality system guidelines ensuring projects are well documented and performed to meet the client's specifications.





#28

Cancer Tissue and Pathology Shared Resource

Winship Cancer Institute

Daniel J. Brat MD, PhD, Director

Gabe Sica, MD, PhD, Co-Director

Tissue-based investigation represents a scientific cornerstone for clinical, translational, basic and epidemiologic research. The mission of the Winship **Cancer Tissue and Pathology (CTP) Shared Resource** is to enhance tissue-based investigation by providing a centralized source of high quality human tissue samples and comprehensive histopathological services. This shared resource is comprised of the **Human Tissue Procurement Service (HTPS)**, which provides high quality cancer specimens from consenting patients to investigators, and the **Research Pathology Laboratory**, which offers a full array of standard and advanced pathology services.

The **HTPS** is under the direction of Winship, with supervision by faculty members of the Department of Pathology and Laboratory Medicine. The HTPS is centered at Emory University Hospital with affiliated banking sites at Emory Midtown and Grady Memorial Hospitals. It contains over 55,000 specimens for research and procures approximately 7,000 new specimens per year.

The **Research Pathology Laboratory** is also under the direction of Winship and provides investigators routine and advanced histopathologic services with rapid turnaround times for standard projects. The highest volume services are general histological techniques performed on tissues from animal models and human disease, including paraffin and frozen section histology and immunohistochemistry. Other services include tissue microarray (TMA) production, and whole slide scanning for digital pathology applications.



#29

Emory Sleep Center

Research Sleep Testing

The Emory Sleep Center Core Research Sleep Laboratory is available to service your sleep research protocol needs.

There are 2 research sleep study bedrooms with adjacent bathroom and shower which will be staffed by registered Sleep Technologists, a Clinical Research Nurse and supervised by our sleep medicine board certified physicians. Our state-of-the-art laboratory is located in the recently opened Brain Health Center at 12 Executive Park Drive NE – conveniently located right off I-85 with free adjacent parking. The sleep laboratory is accredited by the American Academy of Sleep Medicine.

All studies are performed with Embla N7000 equipment and can include full montage EEG channels, multiple EMG leads, EOG, airflow sensors (both nasal pressure and thermistor), inductance plethysmography for respiratory effort measurement, ECG signals, pulse oximetry, transcutaneous or end-tidal carbon dioxide measurements, audio and videotaping synchronized to polysomnography with infrared lighting. Studies are scheduled, coordinated, performed, scored and ready for your interpretation within a week of testing. Studies are maintained on a server which is partitioned for individual investigators.

Services offered:

- Overnight Polysomnography testing (PSG) with and without PAP
- Nap studies (PSG)
- Multiple Sleep Latency testing (MSLT)
- Maintenance of wakefulness testing (MWT)
- Home Sleep Apnea Testing (HSAT)
- Phlebotomy during testing

Contact Information:

Nancy Collop, MD

Director, Emory Sleep Center

Nancy.Collop@emory.edu

Reid Willingham

Administrator, Emory Sleep Center

Reid.Willingham@emory.edu



#30

Cherry L. Emerson Center for Scientific Computation

The Cherry L. Emerson Center for Scientific Computation was established in 1991 as a result of a generous donation from Dr. Cherry L. Emerson and a matching contribution by Emory University. A new Emerson Hall was introduced in 2001 where the Center's staff and computer servers are currently located.

The objective of the Center is manifold, including: (1) To provide high-end computational facilities and expertise to the computationally oriented scientific research at Emory, and to propel Emory into the forefront of research in computational sciences; (2) To help provide state-of-the-art education on computational sciences at Emory, and to help bring computational education in Emory to the highest possible national and international levels; (3) To Promote multi-disciplinary research in the frontiers of natural sciences, (4) To encourage collaborations with other national and international institutions, as well as on Emory campus; (5) To emphasize the importance of knowledge dissemination and to draw attention to current trends in science. (The Center organizes an annual symposium, known as “The Emerson Center Lectureship Award Symposium”.)

The Center currently has over a hundred active users including faculty and students from Biology, Chemistry and Physics departments. The Center's Subscribers have access to state-of-the-art computational facilities, world-class experts, and the Visiting Fellows Program, which brings to campus experts in various fields of computational sciences that are of interest to our faculty and students.

The Center is housed on the fifth floor of the Cherry Logan Emerson Hall. Currently, it owns, maintains and operates an array of computers:. The Center also maintains and provides service to more than 35 state-of-the-art application programs.

Contact Information

Jamal Musaev, PhD, Director

dmusaev@emory.edu

#31

Molecular Pathology at Yerkes

The Molecular Pathology Core at the Yerkes National Primate Research Center under the leadership of the Laboratory Director-Dr. Prachi Sharma continues to provide immunohistochemistry and in situ hybridization services to Emory and external investigators. ☐The lab provides In Situ Hybridization (ISH), fluorescence in situ hybridization (FISH), immunohistochemistry (IHC) and immunofluorescence (IF) staining on paraffin-embedded and frozen nonhuman primate and rodent tissue sections. The facility also develops new protocols for ISH/FISH and IHC using probes and antibodies for requesting investigators. Turn-around time: ☐ Routine services (established protocols) currently average 1-2 weeks from the time of submission.



#32

CFAR Core Labs

The CFAR at Emory's mission is to facilitate the conduct of scientifically rigorous "crucible to community" basic, clinical, translational, and social/behavioral research in HIV/AIDS and to connect HIV/AIDS researchers within and across scientific fields. One of the ways we seek to accomplish this is through investigator access to five science cores. They are: 1) Biostatistics & Biomedical Informatics, 2) Clinical Research, 3) Immunology, 4) Prevention Science, and 5) Virology & Molecular Biomarkers.

Biostatistics and Biomedical Informatics Core

Bob Lyles, PhD: Director

Kirk Easley, MS: Associate Director

The Biostatistics and Biomedical Informatics Core provides essential biostatistics, biomedical informatics and data management collaborative/consulting expertise.

For more information or to request services contact: [Kirk Easley](#)

Clinical Research Core

Jeffrey Lennox, MD: Co-Director

Mark Mulligan, MD: Co-Director

The Clinical Research Core facilitates the design and implementation of studies that improve knowledge about, prevention of, and treatment for HIV infection in humans. Biologic samples from selected patients at our Ponce, Midtown and VA clinics, along with samples from healthy volunteers recruited through the Clinical Core's Hope Clinic site, are available through the CFAR Clinical Research Database and Linked Specimen Repository.

For more information or to request services contact: [Cameron Tran](#)

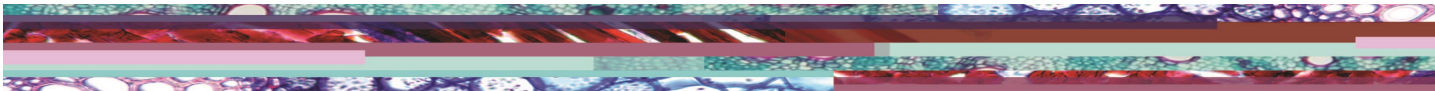
Immunology Core

John Altman, PhD: Director

Chris Ibegbu, PhD: Associate Director

The Immunology Core supports the assessment of immunological function necessary for the study of the pathogenesis, treatment, and prevention of immunodeficiency virus infections in humans and non-human primates and is located at the Yerkes National Primate Research Center.

For more information or to request services contact: [Chris Ibegbu](#)



Prevention Science Core

Patrick Sullivan, DVM, PhD: Co-Director

Gina Wingood, ScD, MPH: Co-Director

The Prevention Science Core facilitates the use of measurement technologies in the conduct of qualitative and behavioral research, promotes the local and national dissemination of results from HIV-related behavioral and social sciences research, and provides scientific leadership in developing theory-based HIV/AIDS interventions.

For more information or to request services contact: [Tracy Farmer](#)

Virology & Molecular Biomarkers Core

Guido Silvestri, MD, PhD: Director

Colleen Kraft, MD: Associate Director - Clinical Virology Laboratory

Thomas Vanderford, PhD: Associate Director – Preclinical Virology Laboratory

The Virology and Molecular Biomarkers Core supports virology studies at all points along the spectrum of HIV/AIDS and SIV research for humans and non-human primates. The Core's preclinical laboratory is located at Yerkes and provides a broad spectrum of virological and gene expression assays for investigators studying SIV/SHIV infection in nonhuman primates. The Core's clinical laboratory is located at the WMB and provides HIV viral load quantification and assays related to HIV-associated diseases in humans.

For more information or to request clinical virology services contact:

[Jessica Ingersoll](#)

For more information or to request pre-clinical virology services contact: [Vandy Vanderford](#)



EMORY
UNIVERSITY

**Center for
AIDS Research**



#33

X-ray Crystallography Center

The primary function of the X-ray center is the determination of the arrangements of atoms and molecules in inorganic, organometallic, organic and biological compounds. Chemists and biologists use the information to validate and improve their inorganic and organic syntheses and to understand the biological activity of their compounds. Many laboratories rely heavily on X-ray crystallography for the unambiguous structural characterization, including the absolute structure determination, of their products. They use the data not only to establish relative and absolute stereochemistry but also to confirm regioselective outcomes of reactions.

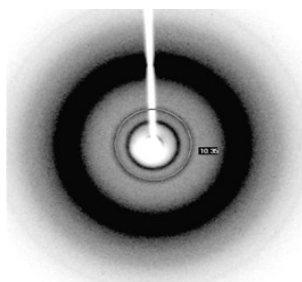
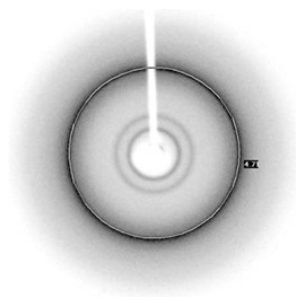
Single Crystal Structure Analysis.

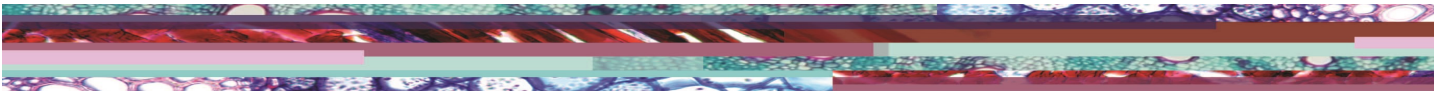
If you can grow a new crystal, we can collect high quality diffraction data for a good structure analysis. The high standard of our data, our refinements, and pre-publication checks means that your structure will get accepted by the major chemical journals. We examine structures carefully and can provide a detailed analysis of the results. We supply you with a short report of your structure as well as any supplementary information that is needed for publication. The complete analysis can usually be done on the same day as the sample was received

X-ray Powder Diffraction Analysis of Protein Assemblies.

A recent technique we have developed is measuring diffraction patterns from microamounts of biological materials. This give us d-spacings in the range 20 Å – 1.5 Å. The resulting spacings allows us to identify protein/peptide packing motifs.

The information from these studies provides tools for the structural analysis of a wide range of novel biological materials that may be used in biomedical applications such as drug delivery.





Powder Diffraction Analysis.

If you cannot grow single crystals of your compounds, we can collect powder diffraction data for phase identification analysis and in some cases determine the crystal structure of the compound from powder data.

Charge density analysis of biologically active compounds.

The center is carrying out charge density refinements of biologically active compounds. This research yields chemically useful information from X-ray data such as electron densities in chemical bonds, arrangement of lone pair electrons and atomic charges. Positive and negative electrostatic potential isosurfaces, for biologically important drug molecules, are derived by this method. Examples of molecules and molecular fragments whose charge densities we have analyzed are shown below:

We aim to extend this research to transition metal atoms. A complete electron-density distribution is available from this method, and therefore enable us to understand the capacity of a molecule to interact with a protein-binding site. This is very important for protein binding studies and in understanding the biological activity of our compounds.

#34

Viral Vector Core

The Emory Viral Vector Core provides following services:

- Customized High-titer and purified Lentiviral and Retroviral vectors
- Customized High-titer and purified Adeno-associated virus serotypes: 1, 2, 5, 9, & hybrids
- Consultations for design and construction of your viral vector

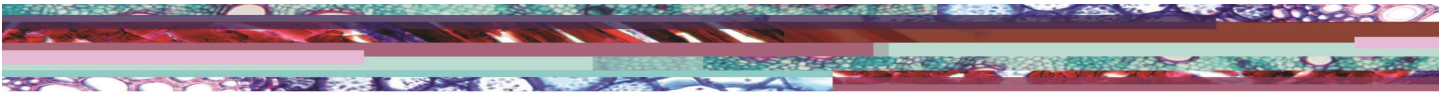
http://neurology.emory.edu/ENNCF/viral_vector/index.html

Contact: Xinping Huang

xhuang4@emory.edu

404-727-4191





Thank you for attending
Core Day 2015.

<http://med.emory.edu/research/index.html>



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**Emory Integrated
Core Facilities**