



EMORY
UNIVERSITY

Emory Integrated
Core Facilities

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As one of the nation’s leading research universities, Emory offers an exceptional breadth of resources and innovative technologies to support research and discovery.

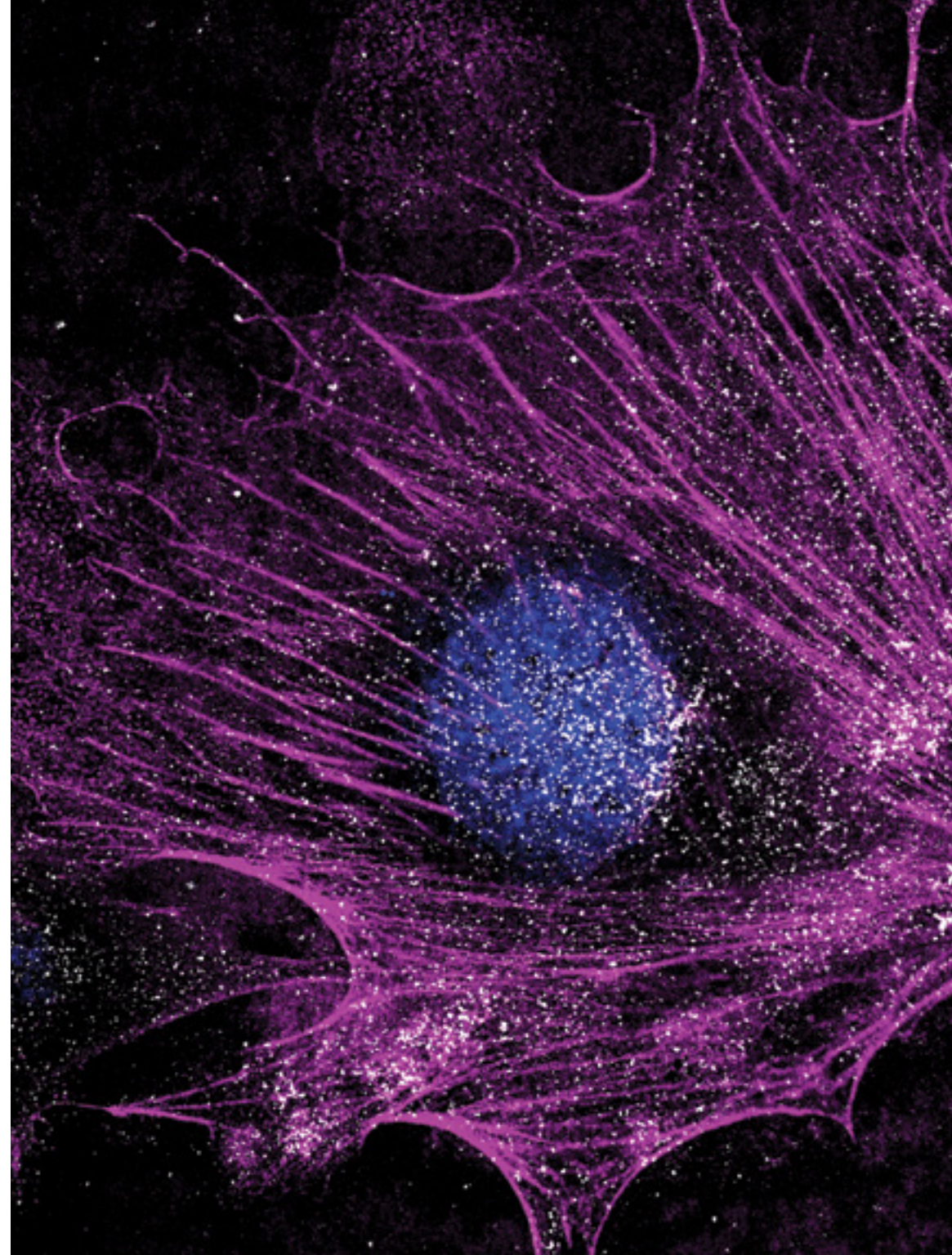
Our Integrated Core Facilities provide researchers with advanced tools and equipment paired with specialized expertise to advance multi-disciplinary research excellence. Our integrated core offerings with eighteen active centers continue to expand to support our scientists’ growing needs.

In addition to our Integrated Core Facilities, Emory investigators have access to unit and department-specific core facilities that provide unique capabilities to enhance research and fuel collaboration. Furthermore, the Georgia Core Facilities Partnership, supported by the Georgia Research Alliance’s Georgia Core Exchange website and database, facilitates investigator access to core facilities at Georgia’s eight largest research universities.

In this brochure, you will find an overview of our current offerings to support your research needs. To inquire about services available, contact EmoryCores@emory.edu.

Many thanks to the Integrated Cellular Imaging Core for providing the stunning images in this brochure.

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BIostatistics Collaboration Core BCC

cores.emory.edu/bcc

The Emory Biostatistics Collaboration Core (BCC) provides researchers state-of-the-art statistical and bioinformatics analyses to support scientific rigor and reproducibility. Their mission is to collaborate with investigators to support optimal study design for quantitative analysis and ensure appropriate statistical methodology implementation in research. The BCC has access to a broad range of computer hardware and software and personnel with expertise with major statistical, graphics, and data management packages.

Services offered include:

- Statistical and bioinformatics analysis for abstracts and manuscripts
- Collaboration on grant proposals
- Study design
- Database development, implementation, and maintenance
- Data mining and analysis of large, administrative datasets

For more information, contact BCC@emory.edu.

CENTER FOR SYSTEMS IMAGING CORE CSIC

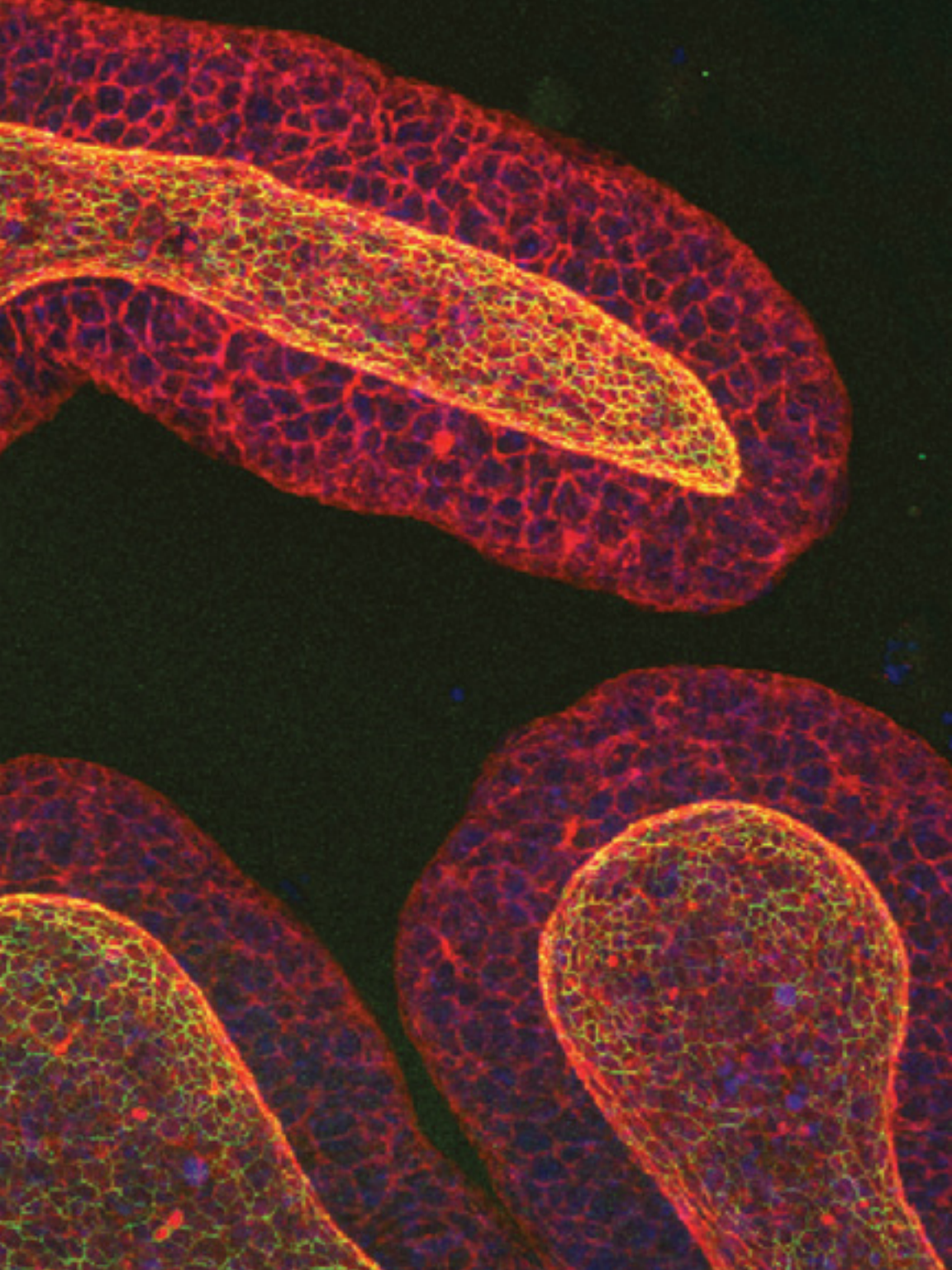
cores.emory.edu/csic

The Center for Systems Imaging Core (CSIC) provides investigators access to the latest pre-clinical human and animal imaging technologies. The CSIC supports the development and application of emerging biomedical imaging technologies, facilitates research focused on imaging biomarker discovery and development, and builds cross-cutting educational and training programs.

Services offered include:

- Positron emission tomography (PET) imaging
- Radiochemistry/Cyclotron
- MRI imaging
- Professional interpretation of MRI images
- Animal imaging (Micro PET/CT, 9.4T MRI)
- Data analysis

For more information, contact CSIC@emory.edu.



DIVISION OF ANIMAL RESOURCES DAR

cores.emory.edu/dar

The Division of Animal Resources (DAR) promotes people's health and well-being by providing researchers the finest animal care and support at Emory University.

Services offered include:

- Veterinary services
 - *Veterinary pathology and technical services*
 - *Virus/antibody-free rodent housing*
- Veterinary information
 - *Analgesic and anesthetic drugs*
 - *Major/minor surgical procedures and post-operative care*
- Sentinels
 - *Mouse and rat health surveillance and maintenance program*
- Rodent management
 - *Mutant rodent lines*
 - *Genetic monitoring*
- Educational opportunities
 - *Veterinary externship program*
 - *Residency training*

For more information, contact darcust@emory.edu.

EMORY GLYCOMICS AND MOLECULAR INTERACTIONS CORE EGMIC

cores.emory.edu/egmic

The Emory Glycomics and Molecular Interactions Core (EGMIC) provides researchers access to the latest functional glycomics and molecular interaction methods and technologies. The EGMIC effectively implements its critical technologies and provides consultations, cutting-edge services, expert training, and support for various systems.

Services offered include:

- Comprehensive glycomics analyses
- Protein-glycan, protein-protein, or protein-small molecule interaction analyses
- Hydrogen Deuterium Exchange mass spectrometry
- Characterization of recombinant proteins and synthetic peptides
- Ion mobility mass spectrometry of proteins, peptides, and small molecules
- Quantitative mass spectrometry

For more information, contact EGMIC@emory.edu.

EMORY FLOW CYTOMETRY CORE EFCC

cores.emory.edu/fcc

The Emory Flow Cytometry Core (EFCC) provides quantitative flow cytometric analyses for samples from various biological matrices to support clinical and basic research efforts. They seek to unite diverse research interests, allowing investigators to share ideas, expertise, and instrumentation. Developing new flow cytometric techniques and acquiring new cutting-edge equipment are central to their mission to serve Emory investigators. Sample types include blood, bone marrow, spleen, serum, plasma, solid tissues, and cell extracts.

Services offered include:

- Flow cytometry: analysis
- Flow cytometry: sorting
- Flow cytometry: training

For more information, contact EFCC@emory.edu.

EMORY GNOTOBIOTIC ANIMAL CORE EGAC

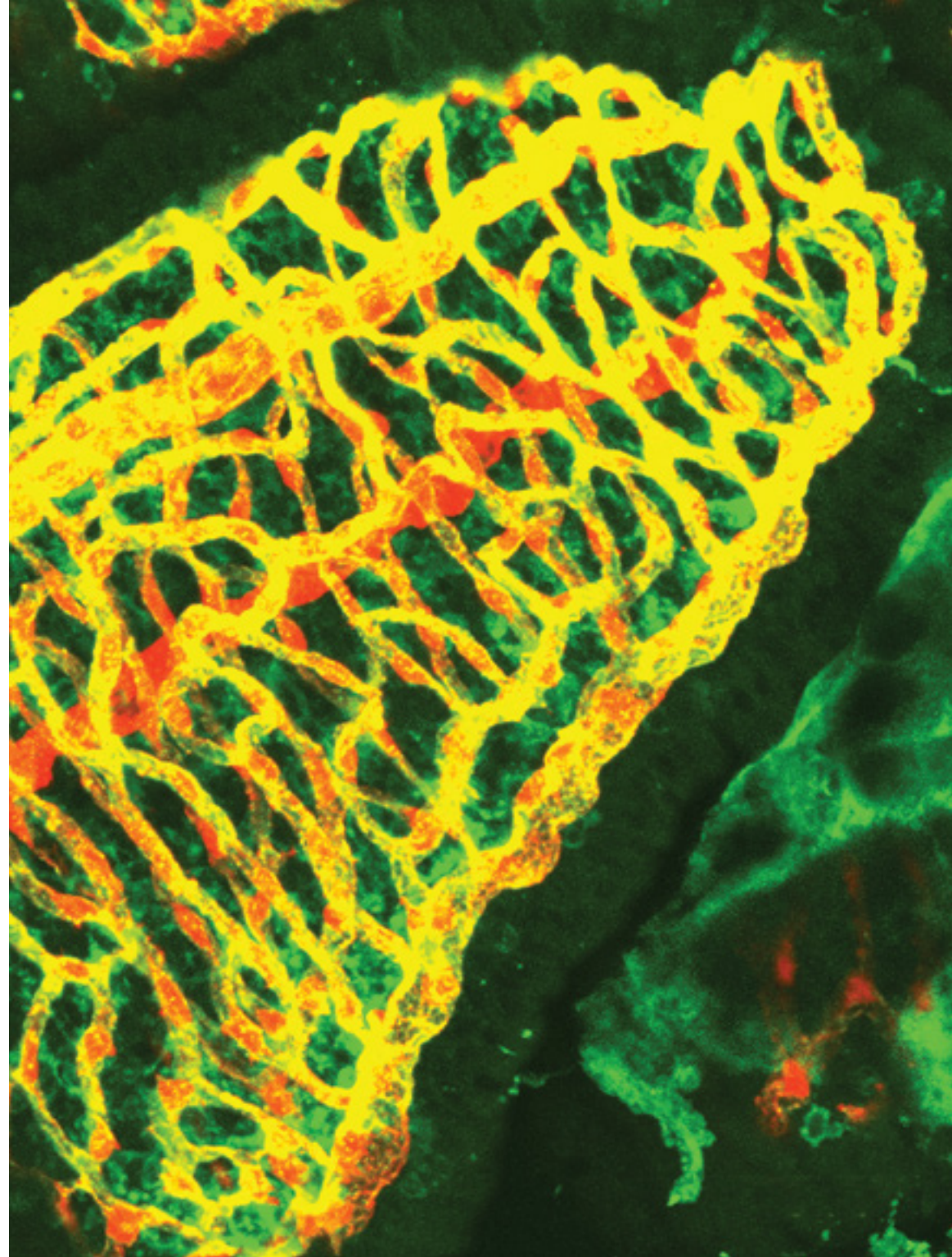
cores.emory.edu/egac

The Emory Gnotobiotic Animal Core (EGAC) provides investigators the opportunity to experimentally manipulate the microbiomes of mice in a controlled environment to gain insight into critical biological mechanisms. The facility oversees several three-foot-wide rigid isolators, each with the capacity to house 16 mice cages. Also, the facility has a Tecniplast ISOCageP Bioexclusion system comprised of airtight individual mouse cages designed explicitly for cage-scale germ-free, gnotobiotic, and bioexclusion studies. The EGAC effectively implements its critical technologies and provides consultations, expert training, and support for all systems.

Services offered include:

- Providing GSF/ASF animals
- Germ-free housing GF
- Experimental isolator
- Experimental isocage
- Technical services

For more information, contact EGAC@emory.edu.



EMORY INTEGRATED COMPUTATIONAL CORE EICC

cores.emory.edu/eicc

The Emory Integrated Computational Core (EICC) provides cutting-edge computational support to investigators with large “-omics” datasets. The EICC offers comprehensive bioinformatics pipelines and services to analyze -omics data, providing tailored and innovative solutions and insights for investigators. The EICC also offers data storage and computational infrastructure to support data life-cycle management, including data transfers, cloud storage, access to the LabKey data management and collaboration platform, and submission of data to national repositories.

Services offered include:

- Genomics analyses
 - Whole genome and exome sequence analysis
 - Somatic mutation analysis
 - Cytogenetic/SNP genotyping analysis
- Epigenomics analyses
 - ATAC-seq data analysis
- Transcriptomics analyses
 - RNA-Seq data analysis
 - Single cell analysis
- Proteomics analyses
 - Label-free quantification
- Metagenomics analyses
 - Amplicon (16S rRNA) analysis
 - Shotgun metagenomic analysis
- Clinical data analyses

For more information, contact EICC@emory.edu.

EMORY INTEGRATED GENOMICS CORE EIGC

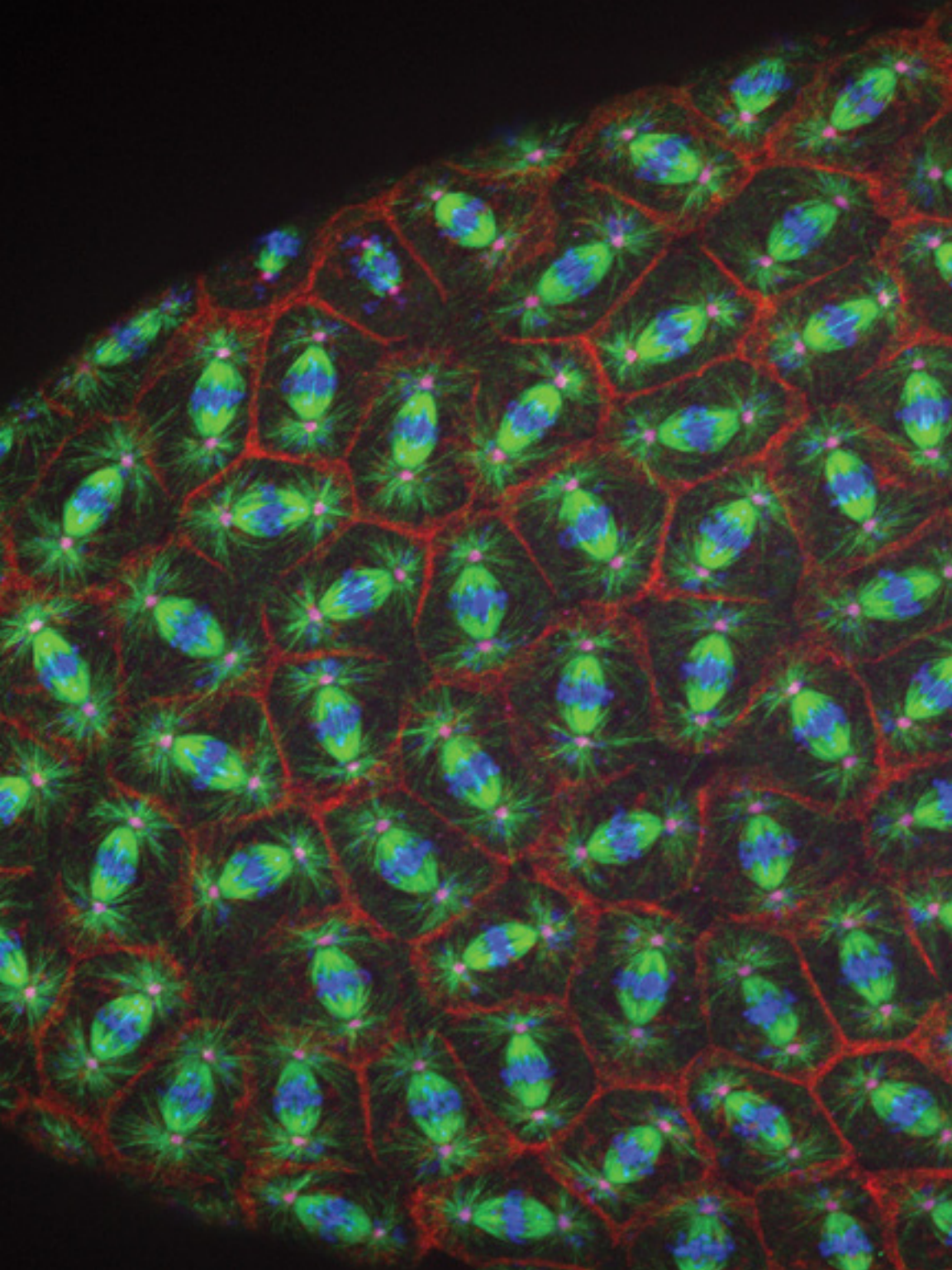
cores.emory.edu/eigc

The Emory Integrated Genomics Core (EIGC) provides investigators access to the latest genomics platforms to pursue their research goals. The EIGC maintains CLIA certification offering assay validation and nucleic acid extraction services from various biological sources to support fundamental and clinical research. Sample types include blood, serum, plasma, solid tissues, and cell extracts. The EIGC also characterizes and confirms the identity of cell lines in support of scientific rigor and reproducibility and provides next-generation sequencing, single-cell sequencing, epigenetics, and genome engineering services for researchers.

Services offered include:

- Whole-genome sequencing
- Targeted sequencing
- Structural variation detection
- 16S rDNA amplification and sequencing
- Metagenomics
- RNA-Seq, ATAC-Seq, ChIPSeq, CUT&RUN
- Custom Cloning and Genome Editing

For more information, contact EIGC@emory.edu.



EMORY INTEGRATED METABOLOMICS AND LIPIDOMICS CORE EIMLC

cores.emory.edu/eimlc

The Emory Integrated Metabolomics and Lipidomics Core (EIMLC) provides investigators cutting-edge metabolomics and lipidomics services to support fundamental and clinical research. The EIMLC provides targeted and untargeted metabolomics as well as quantitative, plate-based metabolomics using Biocrates Quant500. The core team also offers quantitative lipidomics analyses for lipid samples from various biological matrices—such as blood, serum, plasma, solid tissues, and cell extracts. These analyses will provide insight into both lipids and lipid precursors whose abundance can be monitored as biomarkers to predict and follow the progression of a wide range of diseases.

Services offered include:

- Automated and robust sample preparation using liquid handling robot
- Untargeted lipidomics and metabolomics using liquid chromatography coupled to high-sensitivity, high-resolution orbitrap mass spectrometer, Thermo IDX
- Targeted lipidomics analyses using cutting-edge, high sensitivity triple quadrupole mass spectrometers, Agilent 6495c and QTrap5500
- Consultation for preparation/handling of lipid samples, experimental design
- Data analysis consultations

For more information, contact EIMLC@emory.edu.

EMORY INTEGRATED PROTEOMICS CORE EIPC

cores.emory.edu/eipc

The Emory Integrated Proteomics Core (EIPC) provides investigators the latest proteomics technologies to identify and characterize proteins in support of their fundamental and clinical research. The EIPC's proteomics platform relies on LC-MS/MS to analyze peptide mixtures of single proteins and more complex proteomes captured from cells and tissues. The sensitivity and high throughput of the LC-MS/MS system is pivotal to proteomic analyses. The EIPC provides qualitative and quantitative proteomic services using the LC-MS/MS system and its associated bioinformatics pipelines.

Services offered include:

- Protein identification (in-gel or in solution digestion)
- Interactome analysis (on-bead digestion)
- Post-translational modifications (PTM)
- Isobaric (TMT) and label-free quantification
- Bioinformatics analysis

For more information, contact EIPC@emory.edu.

EMORY MULTIPLEXED IMMUNOASSAY CORE EMIC

cores.emory.edu/emic

The Emory Multiplexed Immunoassay Core (EMIC) helps investigators use the latest multiplexed immunoassays in their research. The EMIC performs, analyzes, and interprets multiplexed immunoassays to measure protein levels in biological matrices such as plasma, serum, cerebrospinal fluid, milk, urine, stool, vaginal swab, and other tissues using the Meso Scale Discovery (MSD) platform. The EMIC also supports V-PLEX assay plates developed under rigorous design control and thoroughly validated according to fit-for-purpose principles and the FDA's analytical validation guidelines.

Services offered include:

- Multiplexed biomarker
- Cytokine
- Protein signaling
- Immunogenicity
- Toxicity
- Custom assays

For more information, contact EMIC@emory.edu.

EMORY CELLULAR AND IMMUNOTHERAPY CORE ExCITE

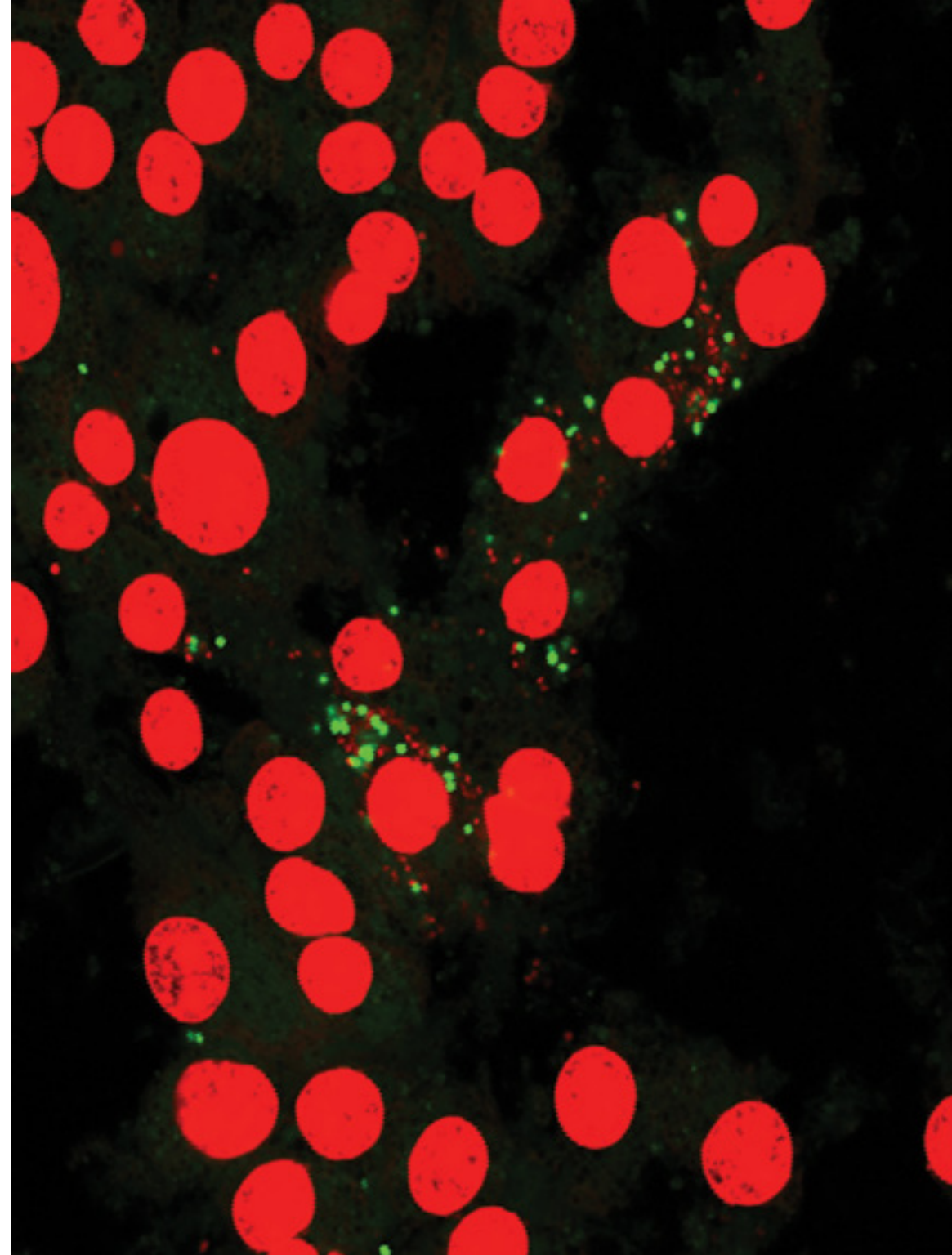
cores.emory.edu/ExCITE

The Emory Cellular and Immunotherapy Core (ExCITE) supports investigator-driven phase I/II immunotherapy and cell therapy clinical trials. The ExCITE provides a unique resource to the Emory community in assisting with translating cellular therapies from the bench side to the clinic. As the core facility evolves, so will the services provided to investigators.

Services offered include:

- Cell isolation
 - Bone marrow mononuclear cells
 - Peripheral blood cells
 - Magnetically coupled antibody selection
- Sterility testing
 - Bacteria, mycoplasma, endotoxin
- Cell propagation/modification
 - Adherent (small scale)
 - Suspension (small scale)
 - Clinical expansion
- Cell freezing and storage
 - Computer-controlled step-down freezing
 - LN2 vapor phase storage
 - LN2 liquid storage
- Cell characterization
 - Immunophenotyping
 - Differentiation
 - Potency
- Consultation services
 - Non-clinical
 - Clinical
 - Chemistry, manufacturing, and content

For more information, contact ExCITE@emory.edu.



EMORY STEM CELL CORE ESCC

cores.emory.edu/escc

The Emory Stem Cell Core (ESCC) derives and characterizes human-induced pluripotent stem cells (iPSCs) from terminally differentiated somatic cells using non-integrating methods. iPSCs generated from patients with a genetic defect allow for a unique opportunity to study disease mechanisms in an in vitro model. Additionally, the ESCC provides training and educational resources to support investigators interested in human stem cells. The core interfaces with other Emory Integrated Core Facilities as a pipeline to analyze patient cells that will inform drug discovery and personalized medicine.

Services offered include:

- Reprogramming and characterization of somatic cells to iPSCs
- Biopsy tissue processing for fibroblasts
- Thawing and propagation of fibroblasts
- Processing of whole blood for PBMCs and erythroid progenitor cells (EPCs)
- Thawing and propagation of iPSCs or human ESCs
- Generation of iPSC derived neural progenitor cell (NPCs)
- Generation of lympho-blastoid cell lines (LCLs)
- Karyotyping
- Training
- Custom services

For more information, contact ESCC@emory.edu.

INTEGRATED CELLULAR IMAGING CORE ICI

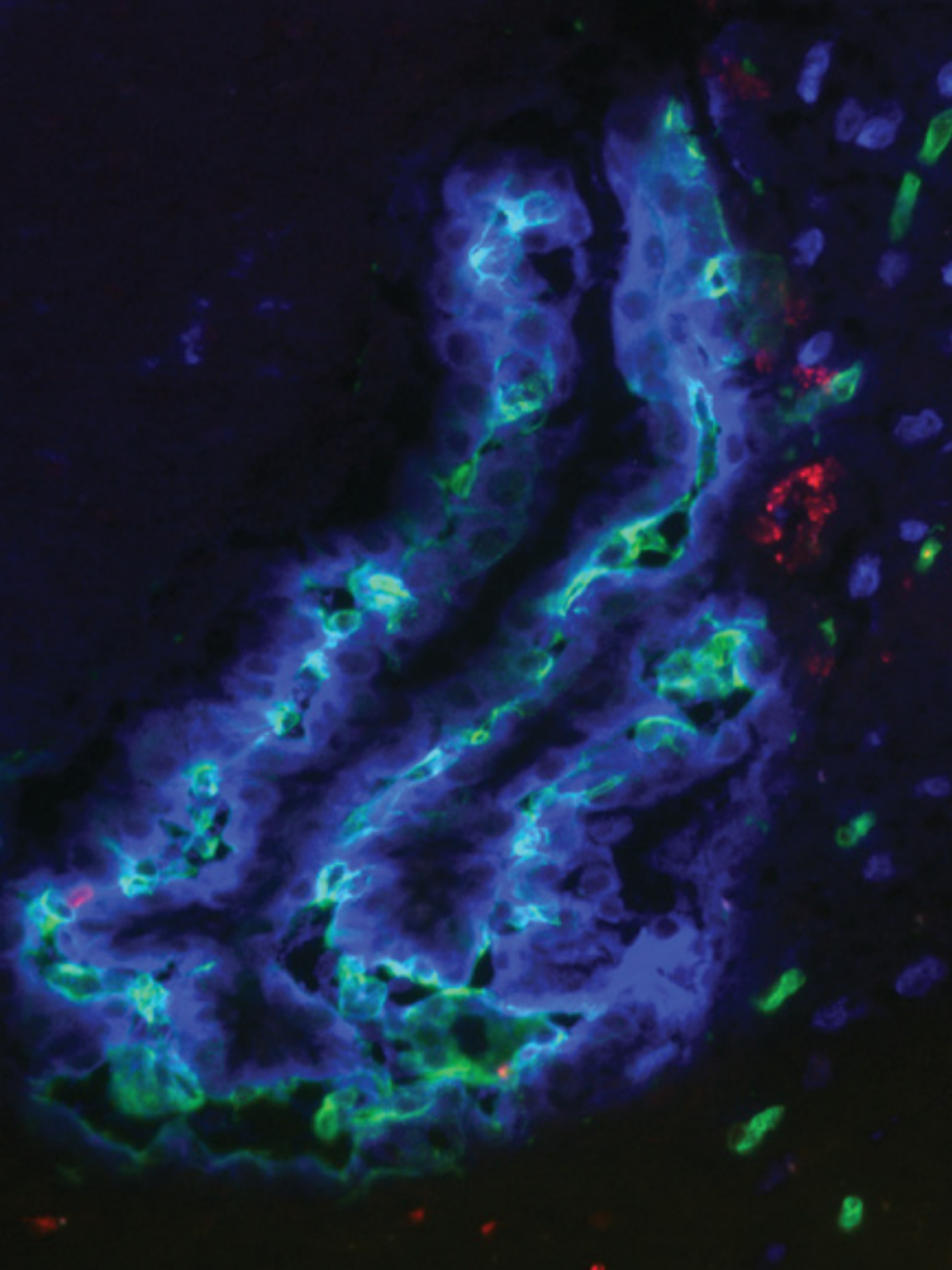
cores.emory.edu/ici

The Integrated Cellular Imaging Core (ICI) provides investigators support from bench to publication with consultations, expert training, and feedback on all systems, in addition to data analyses and assistance with publications. Along with providing access to equipment, the ICI strives to serve as a nucleator for the local fluorescence microscopy community, uniting diverse microscopy interests and allowing investigators to share ideas, expertise, and instrumentation. Central to their mission is developing new imaging techniques and acquiring new state-of-the-art equipment.

Services offered include:

- Confocal imaging
- Light-sheet imaging
- Live cell imaging
- Multi-photon animal and tissue imaging
- Widefield imaging with deconvolution
- Super resolution imaging
- Image analysis workstations (open source and proprietary softwares)

For more information, contact ICI@emory.edu.



EMORY INVESTIGATIONAL DRUG SERVICE IDS

cores.emory.edu/ids

The Investigational Drug Service (IDS) is an integral part of clinical research at Emory University. Since January 1, 2008, University policy has required that investigators who conduct drug studies use IDS to manage and dispense research drugs. The policy applies to all investigational drugs and commercial drugs that are provided free of charge and used in clinical trials. IDS offers a wide range of services related to all Emory researchers' investigational drug therapies, ensuring that patients enrolled in clinical trials safely and effectively receive their research drugs.

Services offered include:

- Dose preparation and dispensing
- IV compounding
- Capsule compounding for blinded investigator-initiated studies
- Inventory maintenance and control
- Drug storage and temperature monitoring
- Blinding and randomization processes
- Access to sponsor-provided IXRS systems
- Patient return processing
- Drug destruction processing
- Record maintenance and archiving
- Prepare for and permit inspections from sponsors, auditors and FDA
- Ensure adherence to regulations that govern the management of investigational drugs

For more information, contact sroger2@emory.edu.

MOUSE TRANSGENIC AND GENE TARGETING CORE TMF

cores.emory.edu/tmf

The Mouse Transgenic and Gene Targeting Core (TMF) provides advanced equipment and expertise for generating and characterizing genetically altered mouse models. From classic transgenesis and gene targeting in embryonic stem cells to CRISPR-Cas9 gene editing, the core is available to support investigators in manipulating the genome. The TMF also offers rederivation and cryopreservation services.

Services offered include:

- CRISPR/Cas9 injections
- ES cell chimera production and breeding
- Transgenic mice production
- Mouse sperm cryopreservation
- Mouse embryo cryopreservation
- Rederivation from frozen, cold stored or live sperm as well as embryos
- Sperm cryopreservation/rederivation package
- IVF rapid cohort generation
- Laser-assisted IVF or ICSI
- Timed mating and embryo collection
- Embryo and sperm cryopreservation in rats
- 30 years cryo storage included in the cost
- Miscellaneous services/custom projects
- Free project consultation
- Genotyping

For more information, contact MouseCore@emory.edu.

ROBERT P. APKARIAN INTEGRATED ELECTRON MICROSCOPY CORE IEMC

cores.emory.edu/iemc

The Robert P. Apkarian Integrated Electron Microscopy Core (IEMC) provides investigators electron microscopy (EM) training and services. The IEMC offers a wide variety of cutting-edge platforms for imaging and structural determination. Expert staff are available to consult and support researchers.

Services offered include:

- Conventional transmission EM (TEM) & scanning EM (SEM) of biological and materials science specimens
- Cryo-electron tomography
- Cryo-high resolution SEM of frozen-hydrated specimens
- Energy-dispersive spectroscopy (EDS) for elemental analysis
- Conventional light microscopy (LM) imaging
- Negative staining and negative stain single particle EM
- Standard sample embedding for light and electron microscopy
- Standard ultrathin and semithin microtomy, cryo-ultramicrotomy
- High pressure freezing (HPF) and self-pressurized rapid freezing (SPRF)
- Cryo-substitution and embedding
- Ultrathin metal film coating
- LM and EM immunocytochemistry
- Cryo-EM specimen preparation and high resolution single particle cryo-EM
- Image analysis and image processing for grants and publications

For more information, contact EMCore@emory.edu.

RODENT BEHAVIORAL CORE RBC

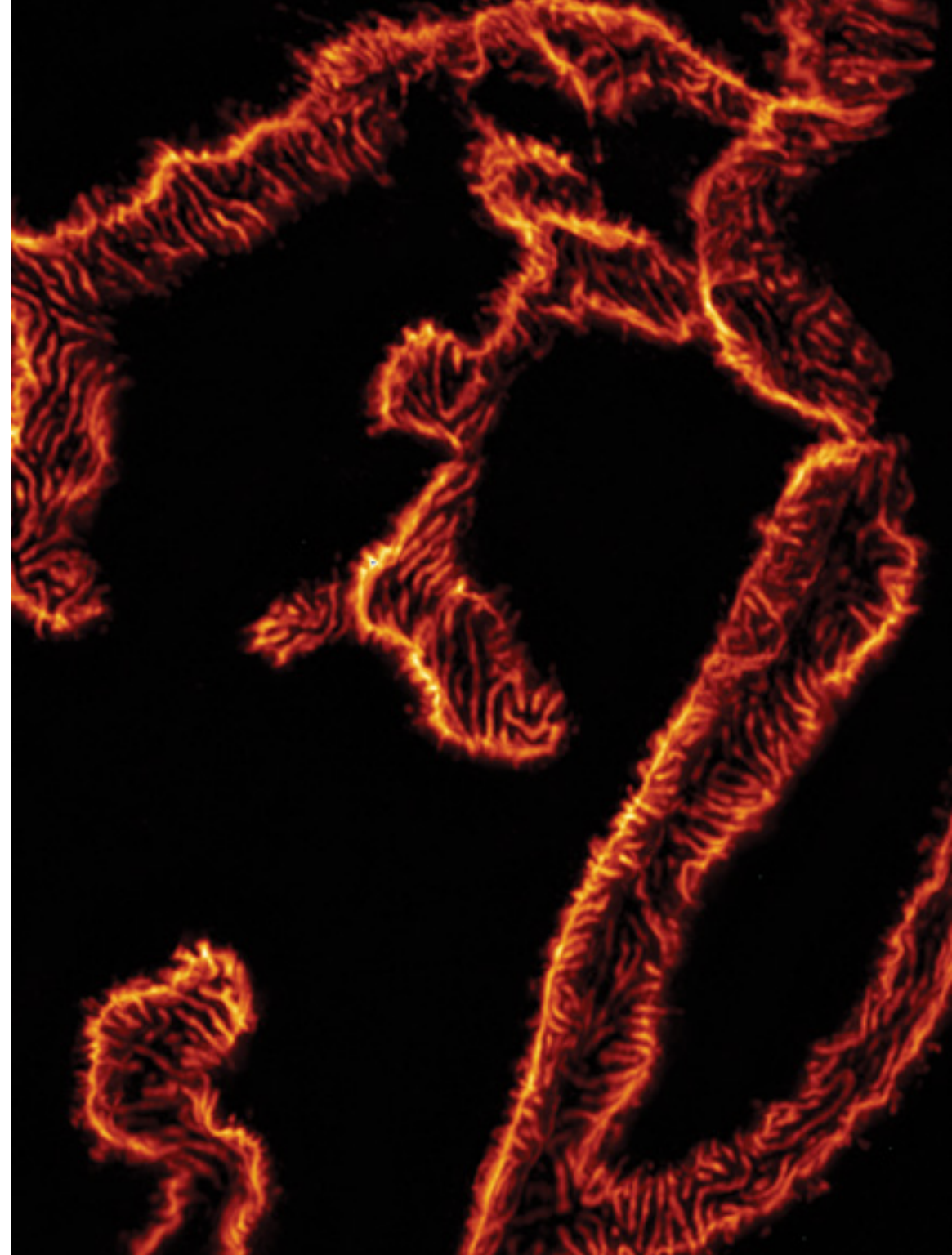
cores.emory.edu/rbc

The Rodent Behavioral Core (RBC) provides investigators with rigorous and reproducible behavioral testing of animal models. The RBC plans, executes, and analyzes behavioral experiments examining activity, arousal, coordinated movement, learning and memory, anxiety, depression, seizure susceptibility, reward/reinforcement, and aggression in mice and rats.

Services offered include:

- Activity
Mouse/rat locomotor activity, circadian rhythm
- Arousal
Mouse behavioral sleep latency
- Coordinated movement
Rotarod, grid performance, stride length, beam traversal, pole test, abnormal involuntary movements
- Learning and memory
Morris water maze, radial maze, social discrimination, social memory, fear conditioning
- Anxiety
Mouse elevated plus maze, mouse dark/light test, mouse/rat open field
- Depression
Forced swim test, mouse tail suspension test, novelty-suppressed feeding, chronic mild stress
- Seizure susceptibility
- Reward/reinforcement
- Aggression
- Surgeries
- Other custom services

For more information, contact RBC@emory.edu.



The images in this brochure are entries from an image competition hosted by the Integrated Cellular Imaging Core and held as part of Emory University’s annual Graduate Division of Biological and Biomedical Sciences Student Research Symposium. Many thanks to the graduate students and the labs for the use of their fascinating images.

PAGE 3 Brandon Ware, *Gregory B. Lesinski Lab*

PAGE 6 Ana Montiero, *Charles Parkos Lab*

PAGE 11 Fadi Paulos, *Brian G. Petrich Lab*

PAGE 14 Elias Castro, *Dorothy A. Lerit Lab*

PAGE 19 Justin Kandler, *William M. Shafer Lab*

PAGE 22 Todd Deveau, *Ling Wei Lab*

PAGE 27 Amanda York, *James Q Zheng Lab*



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