

SHARED FACILITIES AND CORES



Montefiore

**YARON TOMER, M.D.**

The Marilyn and Stanley M. Katz Dean
Albert Einstein College of Medicine
Chief Academic Officer at Montefiore Medicine

The founding mandate of Einstein has been to combine the pursuit of scientific excellence with the social mission to improve human health through engagement in our local, national, and global communities. Einstein's tagline, "Science at the Heart of Medicine", really rings true with me because it accurately describes science as residing at the center of the core of medicine. I view my charge as continuing to expand the opportunities for our faculty, students, and trainees, and not only to excel, but also to lead. To lead the nation, and to lead the world in science and medicine.

Since the founding of the Albert Einstein College of Medicine in 1955, the impact of Einstein investigators on the development and expansion of a wide range of scientific fields and technologies has been disproportionately high relative to the size of the school's faculty and resources. One crucial facilitator of the outstanding success of Einstein researchers has been the availability of a broad range of shared research facilities that provide access to cutting-edge and sophisticated scientific technologies. For example, Einstein was one of the first medical research institutes in the United States to develop a transgenic and knockout mouse shared facility. This facility uniquely enabled Einstein investigators to create novel genetically modified mouse models that propelled research forward across many different scientific disciplines, including the in vivo visualization of mRNA movement in neurons.

Einstein annually supports the more than 40 shared research facilities with millions of institutional dollars to provide Einstein and Montefiore researchers with access to powerful and sophisticated genetic, molecular, structural, analytical, statistical and imaging technologies and the skills of dozens of highly trained support staff. This institutional investment has supported the incorporation of the newest research technologies and instruments into established and new shared facilities to empower Einstein and Montefiore researchers to investigate the most compelling and complex scientific and medical questions, publish their results in high-profile journals and obtain grant funding in the extremely competitive research environment.

To enable Einstein and Montefiore investigators to leverage the full potential of our shared research facilities for their research programs, it is crucial that they are cognizant of their extensive capabilities and know how to access their services. For this purpose, the Office of Scientific Resources has compiled this revised and updated booklet, which details each facility's key personnel, contact information and the specific technologies, and instrumentation it supports. Increased utilization of these shared scientific resources by Einstein investigators will propel their research programs forward and enable them to elucidate the biological mechanisms underlying human diseases and lead the way to developing new treatments and cures. We can best describe the central role played by the shared facilities in supporting the research activities of Einstein investigators by paraphrasing Einstein's tagline: "Shared facilities at the heart of Einstein science."



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Bronx, New York 10461
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BUILDING NAMES AND LOCATIONS

**Arthur B. and Diane Belfer Educational
Center for Health Sciences**

(Belfer)
1300 Morris Park Avenue · Bronx, N.Y. 10461

**Irwin S. and Sylvia Chanin Institute
for Cancer Research**

(Chanin)
1300 Morris Park Avenue · Bronx, N.Y. 10461

Leo Forchheimer Medical Science Building

(Forchheimer)
1300 Morris Park Avenue · Bronx, N.Y. 10461

Samuel H. and Rachel Golding Building

(Golding)
1300 Morris Park Avenue · Bronx, N.Y. 10461

Gruss Magnetic Resonance Research Center

(Gruss)
1300 Morris Park Avenue · Bronx, N.Y. 10461

**Rose F. Kennedy Center for Research in
Mental Retardation and Human Development**

(Kennedy)
1410 Pelham Parkway South · Bronx, N.Y. 10461

Harold and Muriel Block Building

(Block)
1300 Morris Park Avenue · Bronx, N.Y. 10461

Montefiore Medical Center

(MMC)
111 East 210th Street · Bronx, N.Y. 10467

**The Michael F. Price Center for Genetic and
Translational Medicine/Harold and Muriel Block
Research Pavilion**

(Price/Block)
1301 Morris Park Avenue · Bronx, N.Y. 10461

**Siegfried and Irma Ullmann Research Center
for Health Sciences**

(Ullmann)
1300 Morris Park Avenue · Bronx, N.Y. 10461

Van Etten Building

(Van Etten)
1225 Morris Park Avenue · Bronx, New York 10461

**NIH CENTERS SUPPORTING
EINSTEIN SHARED FACILITIES AND CORES**

Montefiore-Einstein Cancer Center (MECC)

Diabetes Research Center (DRC)

Einstein-Rockefeller-CUNY Center
for AIDS Research (CFAR)

Harold and Muriel Block Institute for
Clinical and Translational Research
at Einstein and Montefiore (ICTR)

Marion Bessin Liver Research Center

Rose F. Kennedy Intellectual and Developmental
Disabilities Research Center (IDDRC)

Updated contact information for
core facility staff can be found at
www.einsteinmed.edu/sr

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available at www.einsteinmed.edu/sr/imagecredits



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requests and/or to bill for
services are noted with
this icon throughout the catalog. iLab
allows researchers to reserve time on
devices or submit service requests to
more than 30 Einstein Core Facilities
that are setup to use the system.
It also provides investigators with
reporting tools to track their usage
of cores.

Einstein and Montefiore investigators
can access Einstein's cores through
iLab by going to
<https://einstein.ilabsolutions.com>
and signing in with their active direc-
tory credentials. Visit Einstein's iLab
support webpage for more infor-
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HEPATIC RESEARCH

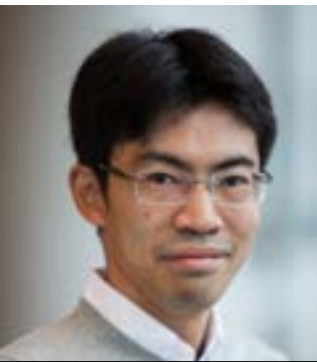
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Keisuke Ito, MD, PhD

SINGLE CELL GENOMICS AND EPIGENOMICS FACILITY

Location: Price/Block 455

Scientific Director: Keisuke Ito, MD, PhD
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Technical Director: Kyoko Ito, MD, PhD
(718) 678-1279 kyoko.ito@einsteinmed.edu

Website: www.einsteinmed.edu/sr/singlecell

The advent of next-generation sequencing technologies has revolutionized molecular epi/genomics. While sequencing itself can now be provided as a fairly simple service, sequencing of genomes and epigenomes of very small numbers of cells, especially single cells, is not broadly available and requires specific expertise. These analyses require amplification and sequencing procedures that are not standard and quite difficult for individual laboratories to perform. In addition, computational and systems analysis, even at the level of standard whole cell population sequencing, remains far from routine. The facility has the infrastructure to provide single-cell assays at the genomic, epigenomic and transcriptomic level to stem cell biologists at Einstein.

Services:

- Single-cell genomics
- Single-cell transcriptomics
- DNA methylation analysis of few or single cells
- Computational analysis
- Expert consultation on experimental design and approaches



Steven Porcelli, MD

FLOW CYTOMETRY CORE FACILITY

Location: Chanin 307 A&B, 308, 309 (main lab),
Price/Block 159 A&B

Scientific Director: Steven Porcelli, MD
(718) 430-3228 steven.porcelli@einsteinmed.edu

Operations Director: Jinghang Zhang, MD
(718) 430-8787 jinghang.zhang@einsteinmed.edu

Center Affiliation: Montefiore Einstein Cancer Center

Website: www.einsteinmed.edu/sr/flowcytometry

The Flow Cytometry Core Facility provides a broad range of equipment and services for the analysis and isolation of cells and other similar-sized particles based on fluorescent labeling. Four high speed cell sorters are available to enable optimized sorting of highly purified cells, subcellular organelles or bacteria. The facility also supports a variety of analytical flow cytometers capable of performing basic to advanced multiparameter fluorescence analysis of many types of cell suspensions as well as analysis of intracellular signaling. An experienced staff of technical experts provides training, instruction, resources, and consultation in the design, execution and analysis of flow cytometry-based studies.

Services:

- High-speed cell sorting using BC MoFloXDP and BD Aria cell sorters
- Basic and advanced analytical flow cytometry using BD Canto II, BD LSR-II and Cytex Aurora analyzers
- Laser scanning cytometry using Compucyte iCys
- Magnetic antibody-bead-based sorting (Miltenyi Biotec SuperMACS)

Frank P. Macaluso, MSc
Vera DesMarais, PhD

ANALYTICAL IMAGING FACILITY

Location: Forchheimer 641, Price/Block 210 & 216

Scientific Director: John S. Condeelis, PhD
(718) 678-1126 john.condeelis@einsteinmed.edu

Director of Electron Microscopy and Administration: Frank P. Macaluso, MSc
(718) 430-3547 frank.macaluso@einsteinmed.edu

Director of Light Microscopy and Image Analysis: Vera DesMarais, PhD
(718) 430-3547 vera.desmarais@einsteinmed.edu

NIH Center Affiliation: Montefiore Einstein Cancer Center
Marion Bessin Liver Research Center

Website: www.einsteinmed.edu/sr/analyticalimaging

The Analytical Imaging Facility (AIF) provides a comprehensive light and electron microscope imaging facility dedicated to offering current methods in modern imaging to biomedical scientists with all levels of expertise. The AIF staff has been cross-trained to seamlessly support visual analysis by techniques ranging from fluorescence light microscope imaging in 3D, to high resolution electron microscopy.

Services:

- Microscopy, including Epi-Fluorescence, Color Brightfield, Laser Scanning Confocal, Spinning Disk Confocal, Multi Photon, and TIRF and Super Resolution (STORM and SIM)
- High capacity, High Resolution Digital Slide Scanner
- Sample Preparation for Electron Microscopy
- X-Ray Microanalysis
- 3D and 4D image visualization and customized image analysis including: Volocity, Imaris, IMOD
- Electron Microscopy, including Transmission, Cryo Transmission, Scanning, and Cryo Scanning
- Correlative Light and Electron Microscopy



Daqian Sun, PhD

STEM CELL ISOLATION AND XENOTRANSPLANTATION CORE

Location: Chanin 638

Scientific Director: Ulrich Steidl, MD, PhD
(718) 430-3437 ulrich.steidl@einsteinmed.edu

Technical Director: Daqian Sun, PhD
(718) 430-3551 daqian.sun@einsteinmed.edu

Website: www.einsteinmed.edu/sr/stemcellxeno

The Stem Cell Isolation and Xenotransplantation Core advances stem cell and cell therapeutic research by providing key technological support for human stem cells FACS sorting and transplantation services to test stem cell differentiation potential in vivo. Consultation and training is provided in experiment design, protocol development, and data analysis of polychromatic flow cytometry analysis and sorting, and xenotransplantation protocols.

Flow Cytometry Service:

- Multi parameter Fluorescent Activated Cell Sorting (FACS) of human and mouse stem/ progenitor cells, cancer stem/ initiating cells and various type of cells in stem cell niche
- High dimensional phenotypic and functional analysis of stem cell by flow cytometry

Xenotransplantation Service:

- Transplantation of human and mouse cells into immune deficient mice
- Live sampling from blood and bone marrow for testing of engraftment



Teresa DiLorenzo, PhD

IMMUNO-TECHNOLOGY CORE

Location: Forchheimer 403

Scientific Co-Director: Teresa DiLorenzo, PhD
(718) 430-2014 teresa.dilorenzo@einsteinmed.edu

Scientific Co-Director: Dirk Homann, MD
(212) 241-1935 dirk.homann@mssm.edu

Center Affiliation: Diabetes Research Center

Website: www.einsteinmed.edu/r/immuno-technology

The Immuno-Technology Core (ITC) is an education and coordination core that encourages and facilitates utilization of select advanced cellular, imaging, and immunomodulation technology platforms that operate across both Einstein and Mount Sinai. Its objectives are to raise awareness about these technologies; to provide consultation and advice about their potential and limitations; to assist researchers with experimental planning, design, and considerations of expected financial investment; and to facilitate interactions with managers, application scientists, and data analysis specialists working with each technology platform.

Services:

- synTac platform (artificial immunological synapse for T cell activation; developed at Einstein by Dr. Steven Almo)
- IVIS Spectrum in vivo imaging system
- Multiplexed immunohistochemical consecutive staining on a single slide
- High-dimensional mass cytometry
- Automated tissue staining (Leica BOND RX automated IHC research stainer)
- Whole slide image acquisition (Hamamatsu NanoZoomer S60 Digital Slide Scanner)



Eric E. Bouhassira, PhD

HUMAN PLURIPOTENT STEM CELL CORE

Location: Ullmann 925

Scientific Director: Eric E. Bouhassira, PhD
(718) 430-2188 eric.bouhassira@einsteinmed.edu

Website: www.einsteinmed.edu/sr/stemcell

The Human Pluripotent Stem Cell facility continuously evaluates emerging technologies and is now offering both feeder-based and feeder-free cultures in chemically defined mTeSR or in N2/B27 media. The Core is currently offering the generation of iPSC cells with two transgene-free methods: 1) using episomes (based on the Yamanaka plasmids); or 2) using Sendai virus.

Services:

- Reprogramming of fibroblasts or blood cells into Induced human pluripotent stem cell (iPSCs)
- Gene editing in iPSCs
- Site-specific insertions in iPSCs
- Human embryonic stem cells (hESCs) culture
- Production of microglia from iPSCs (iMGs)
- Production of hematopoietic stem and progenitor cells from iPSCs (iHSPCs)
- Production of mesenchymal stem cells from iPSCs (iMSCs)
- Processing of primary tissue (blood, skin biopsy, etc...)
- Production of fibroblast culture



Kostantin Dobrenis, PhD

NEURAL CELL ENGINEERING AND IMAGING CORE

Location: Kennedy 328, 522, 616, 618, 625, 712B, 914

Director: Kostantin Dobrenis, PhD
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Director: Sölen Gökhan, MD
(718) 430-3542 solen.gokhan@einsteinmed.edu

Center Affiliation: Rose F. Kennedy Intellectual and Developmental Disabilities Research Center

Website: www.einsteinmed.edu/sr/neuroimaging

The Neural Cell Engineering and Imaging Core combines state-of-the-art equipment and highly personalized service for microscopy-based studies of neural tissues. Technical support is provided to advise, train, and assist Einstein investigators through all pertinent research aspects of neuroimaging including experimental design, specimen preparation, data collection and analysis, and publication-quality figure production.

Services:

- Tissue specimen preparation equipment including microtomes, vibratome, and cryostats
- Neurolucida/Stereoinvestigator microscope for 3D neurite tracing, cell counts and volume measurements
- Upright and inverted digital fluorescence microscopes
- ImageXpress system for automated brightfield and fluorescence imaging of slides, dishes and multiwell plates
- Zeiss confocal microscope with spectral scanning, fast imaging capability and Airyscan module providing facile super-resolution capability
- Multiphoton In Vivo microscope with two tunable lasers up to 1300nm plus a fixed 1040nm line, dual scanners for imaging and photomanipulation, and electrophysiology set-up
- High-throughput Axioscan system for imaging up to 100 slides in brightfield and fluorescence including far-red capability
- Rodent stereotactic stations with microinjectors for precise in vivo delivery of experimental agents
- Laser microdissection and laser capture system, fluorescence plate reader with liquid handling, and Helios biolistics gene gun
- State-of-the-art image processing and analysis software for complex morphometric and other quantitative studies including Imaris, Metamorph, Neurolucida 360, Image-Pro 3D, and Huygens Professional



Irwin Kurland, MD, PhD

STABLE ISOTOPE AND METABOLOMICS CORE

Location: Price/Block 368

Director: Irwin Kurland, MD, PhD
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Operations Manager: Yunping Qiu, PhD
(718) 678-1180 yunping.qiu@einsteinmed.edu

Center Affiliation: Diabetes Research Center

Website: www.einsteinmed.edu/sr/metabolomics


The Stable Isotope and Metabolomics Core can provide targeted and untargeted metabolite profiling of plasma or tissue, and the rate of change of substrates (flux), using stable isotopes and mass spectrometry. The Core has a variety of in vitro and in vivo metabolic methodologies that can determine substrate flux dynamics and metabolite profiles at the organelle, cellular, tissue and whole body levels. In collaboration with other Diabetes Research Center Cores, the application of mass spectrometric and other methodologies allows the elucidation of metabolic mechanisms underlying disorders in fuel homeostasis. The metabolic role of candidate molecules can be specifically delineated in vivo and in vitro, using a step-by-step hypothesis-driven approach in animals, cell lines and other models.

Services:

- Stable isotope substrate flux dynamics
- Metabolite quantification and identification
- Cellular rates of glycolysis and mitochondrial respiration using the Seahorse Biosciences Extracellular Flux Analyzer



EPIGENOMICS FACILITY

Location: Price/Block 159 

Scientific Director: John M. Greally, MB, PhD
(718) 678-1234 john.greally@einsteinmed.edu

Operations Director: Shahina B. Maqbool, PhD
(718) 678-1163 shahina.maqbool@einsteinmed.edu


Center Affiliation: Montefiore Einstein Cancer Center
Rose F. Kennedy Intellectual and Developmental
Disabilities Research Center

Website: www.einsteinmed.edu/sr/epigenomics

Shahina B. Maqbool, PhD



GENOMICS FACILITY

Location: Ullmann 1203 

Scientific Director: Bernice Morrow, PhD
(718) 678-1121 bernice.morrow@einsteinmed.edu

Operations Director: David Reynolds
(929) 246-6735 david.reynolds@einsteinmed.edu

Center Affiliation: Montefiore Einstein Cancer Center

Website: www.einsteinmed.edu/sr/genomics

David Reynolds

The Epigenomics Shared Facility, part of Einstein's Center for Epigenomics, and an Illumina CSPro (certified service provider) laboratory, offers massively-parallel sequencing services, including fully-automated library preparation using TECAN Robotics, quality control and assurance, and a number of assays to study the epigenome. Sample information is uploaded through a web-based interface (WASP) prior to sample submission, allowing LIMS and automated analysis through the WASP system software, returning data through visualization and web links. Data analytical services are provided by the Computational Genomics Core. We encourage novel research in a number of human diseases, with early emphases on cancer, neuroepigenomics, the epigenomics of infectious disease, aging research, diabetes and renal disorders.

Services:

The services will include library preparation and sequencing plus primary data analysis and visualization through WASP (<http://waspsystem.einsteinmed.edu>). Secondary analysis is also provided on request through the Computational Genomics Core (CGC). Supporting assays include:

- Whole Genome Sequencing
- Whole Exome Sequencing
- Mosaic Aneuploidy Detection (MAD-seq)
- Mapping Open Chromatin (ATAC-seq)
- Mapping Chromatin Components (ChIP-seq)
- Whole Genome Bisulfite Sequencing (WGBS)
- HELP-Tagging; HELP-GT
- SeqCap Epi
- RNA-seq
- Small RNA-seq
- Single Cell RNA-seq

The Genomics Core serves the Einstein scientific community by providing a broad range of services, utilizing current and emerging nucleic acid technologies. Contact the director for advice on choosing the appropriate technology or to automate a custom project.

Services:


- Single Cell (sc) Expression
 - ◆ Single Cell RNA-seq: 500 to 10,000 cells per sample
 - ◆ Sample multiplexing with CellPlex
 - ◆ CITE-Seq: Simultaneous protein and gene expression analysis
 - ◆ sc Immune Profiling: TCR/BCR + RNA-seq with optional Protein analysis
 - ◆ Single cell ATAC-seq
 - ◆ Single cell CRISPR screening
 - ◆ Targeted scRNA-Seq
- Single Cell DNA-Seq
 - ◆ Tapestry platform: targeted scDNA-seq on 1000s of cells
 - ◆ Single nucleotide variation, copy number variation
 - ◆ Single cell Multiomics (DNA + Protein)
 - ◆ Connect genotype to phenotype
 - ◆ Genome editing: CRISPR validation
- Spatial Transcriptomics
 - ◆ Map the whole Transcriptome from an entire tissue section
 - ◆ 1-10 cell resolution
 - ◆ Fresh frozen or FFPE tissue
 - ◆ Immunofluorescence protein detection along with whole transcriptome
- Single Cell Western Analysis
 - ◆ Profile heterogeneity in complex samples
 - ◆ Up to 1,000 cells per chip
 - ◆ Validate scRNA-seq data with standard Western antibodies
- Cell Line Authentication – required by NIH and journals
- Genotyping
 - ◆ Taqman SNP assays
 - ◆ Microsatellite (STR) markers
 - ◆ Microsatellite instability analysis
- Automation – transform repetitive tasks, increased accuracy and reproducibility
 - ◆ Ideal for high throughput qPCR experiments
- Sanger DNA Sequencing
- Real Time qPCR – low to high throughput including Taqman Arrays
- DNA/RNA Quantification and Quality Analysis





Jidong Shan, PhD

MOLECULAR CYTOGENETICS CORE

Location: Price/Block 407, 413A 

Scientific Director: Bernice Morrow, PhD
(718) 678-1121 bernice.morrow@einsteinmed.edu

Operations Director: Jidong Shan, PhD
(718) 678-1155 jidong.shan@einsteinmed.edu


Center Affiliation: Montefiore Einstein Cancer Center
Nathan Shock Center of Excellence

Website: www.einsteinmed.edu/sr/cytogenetics



John Greally, MB, PhD

COMPUTATIONAL GENOMICS CORE

Location: Price/Block 353 

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(718) 678-1234 john.greally@einsteinmed.edu

Bioinformaticians: Robert Dubin, PhD
(718) 678-1234 robert.dubin@einsteinmed.edu
Junya Zhang, MS
(718) 678-1234 junya.zhang@einsteinmed.edu

Center Affiliation: Montefiore Einstein Cancer Center
Rose F. Kennedy Intellectual and Developmental
Disabilities Research Center

Website: www.einsteinmed.edu/sr/computationalgenomics

The Molecular Cytogenetics Core provides tools for the preparation of human and murine samples suitable for molecular genetics and cytogenetic analysis of the entire genome. These tools include the establishment of EBV transformed cell lines; isolation of DNA and RNA from a variety of tissue culture samples as well as primary biopsies; preparation of metaphase chromosomes suitable for fluorescence in situ hybridization (FISH) and Spectral Karyotyping (SKY) or whole chromosome paints for human and mouse genome. The core personnel are trained to hybridize commercial probes and to designed locus specific probes for regions of interest to investigators. All the probes are custom designed and in house generated.

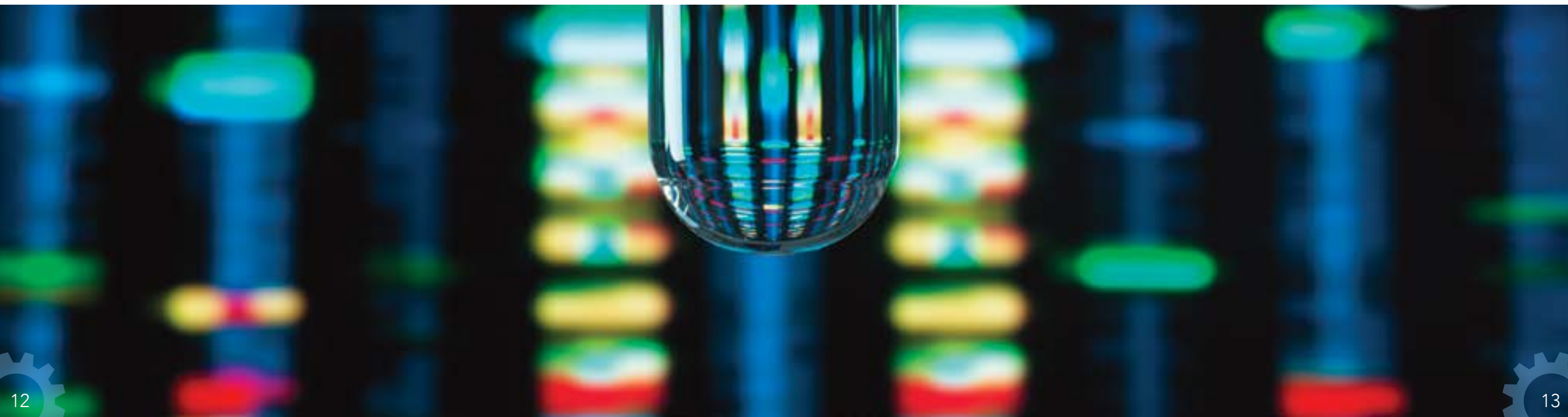
Services:

- FISH HYBRIDIZATION: Locus specific probes and chromosome painting (human and mouse) up to four colors
- SKY-Spectral Karyotyping (human and mouse)
- DAPI-Staining and Chromosome Count
- Generation of Locus Specific Probes (BAC clones, human and mouse)
- EBV transformation and culture expansion of human lymphocytes
- PBMC Isolation and enrichment of other blood cells (T, B, CD34, CD4, and eosinophils)
- DNA and RNA Isolation
- DNA, primary cells and Cell Lines Repository
- Target sequencing 5-100 genes (human and mouse)
- CellRaft AIR System--Single cells picking for NGS analysis
- Ultra-low coverage single cell sequencing for aneuploidy detection
- shRNA and ORF library access
- IncuCyte--live cell imaging system
- gentleMACS Octo dissociator--tissue homogenizer
- Lentivirus and Retrovirus production

The Computational Genomics Core (CGC) supports the Einstein community by providing essential informatics resources and infrastructure for the analysis and interpretation of large genomic and epigenomic datasets, providing timely and standardized delivery of data to investigators, and organizing and presenting tutorials for data retrieval and analysis using the provided tools and methodologies. The CGC will develop primary analysis pipelines, analysis and visualization tools for application-specific handling of data using open-source and commercial analysis tools. All tools will be maintained and deployed in a manner that optimally supports the research activities of individual investigators.

Services:

- Data management: storage and delivery of large genomic data sets
- Data analysis: primary and secondary interpretation of microarrays and next-generation sequencing data
- Pipeline development: assist researchers and core facilities with the development of reproducible, accurate and time-saving pipelines and workflows for analysis of genome-scale experimental data
- Consultation: work with investigators to provide access to the appropriate tools for analysis of their data
- Training: to aid investigators in the analysis of their own data through tutorials covering software and analysis methodologies





J.P. Maianti, PhD

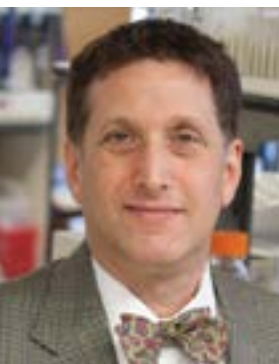
CHEMICAL SYNTHESIS CORE FACILITY

Location:	Gruss 314A	
Scientific Director:	J.P. Maianti, PhD (718) 430-8641 juanpablo.maianti@einsteinmed.edu	
Operations Director:	Peter Bellotti, PhD (718) 430-2793 peter.bellotti@einsteinmed.edu	
Center Affiliation:	Montefiore Einstein Cancer Center	
Website:	www.einsteinmed.edu/sr/chembio	

The Chemical Synthesis Core is equipped with state-of-the-art instrumentations to perform demanding chemical reactions (Schlenk technique, low temperature, photochemical, chiral synthesis, organometallics, carbohydrates, peptides, pressure reactions, isotopic labeling, microwave and other standard chemical techniques). Chemical synthesis service can be tailored for each client. Simple synthesis of reference compounds or collaboration throughout an entire project – from the grant application to the published work – will be addressed on an individual level. For chemistry-related services not listed in our portfolio – please contact us for solutions. We are always willing to explore new ideas and directions.

Services:

- Custom chemical synthesis
- Synthesis consulting & project planning
- Compound Purification and Characterization
- Analytical services
- Data evaluation, editing and publishing support
- Staff for collaborative structural studies of macromolecules



Steven C. Almo, PhD

STRUCTURAL BIOLOGY / X-RAY CRYSTALLOGRAPHY FACILITY

Location:	Ullmann 409
Scientific Director:	Steven C. Almo, PhD (718) 430-2746 steve.almo@einsteinmed.edu
Associate Director:	Jeffrey B. Bonanno, PhD (718) 430-2745 jeffrey.bonanno@einsteinmed.edu
Center Affiliation:	Montefiore Einstein Cancer Center
Website:	www.einsteinmed.edu/sr/xraycrystal

The X-Ray Crystallography Facility provides expertise and resources to obtain high-resolution structures by X-ray diffraction, including crystallization, phasing, structure refinement and data interpretation. To rapidly accomplish these tasks, the facility is equipped with state-of-the-art robotics for screening sub-microliter volumes of protein and stability tests to enhance crystallization efforts. All data are collected using our rapid and sustained access to synchrotron beamlines at Brookhaven or Argonne National Labs. These structural technologies are complemented by cryo-electron microscopy, electron paramagnetic resonance, and computational biology. A full list of services is available on the facility website.


Services:

- Support for solving structures using X-ray crystallography:
 - ◆ Data collection, processing and interpretation
 - ◆ Structure solution
 - ◆ Structure analysis



Sean Cahill, PhD

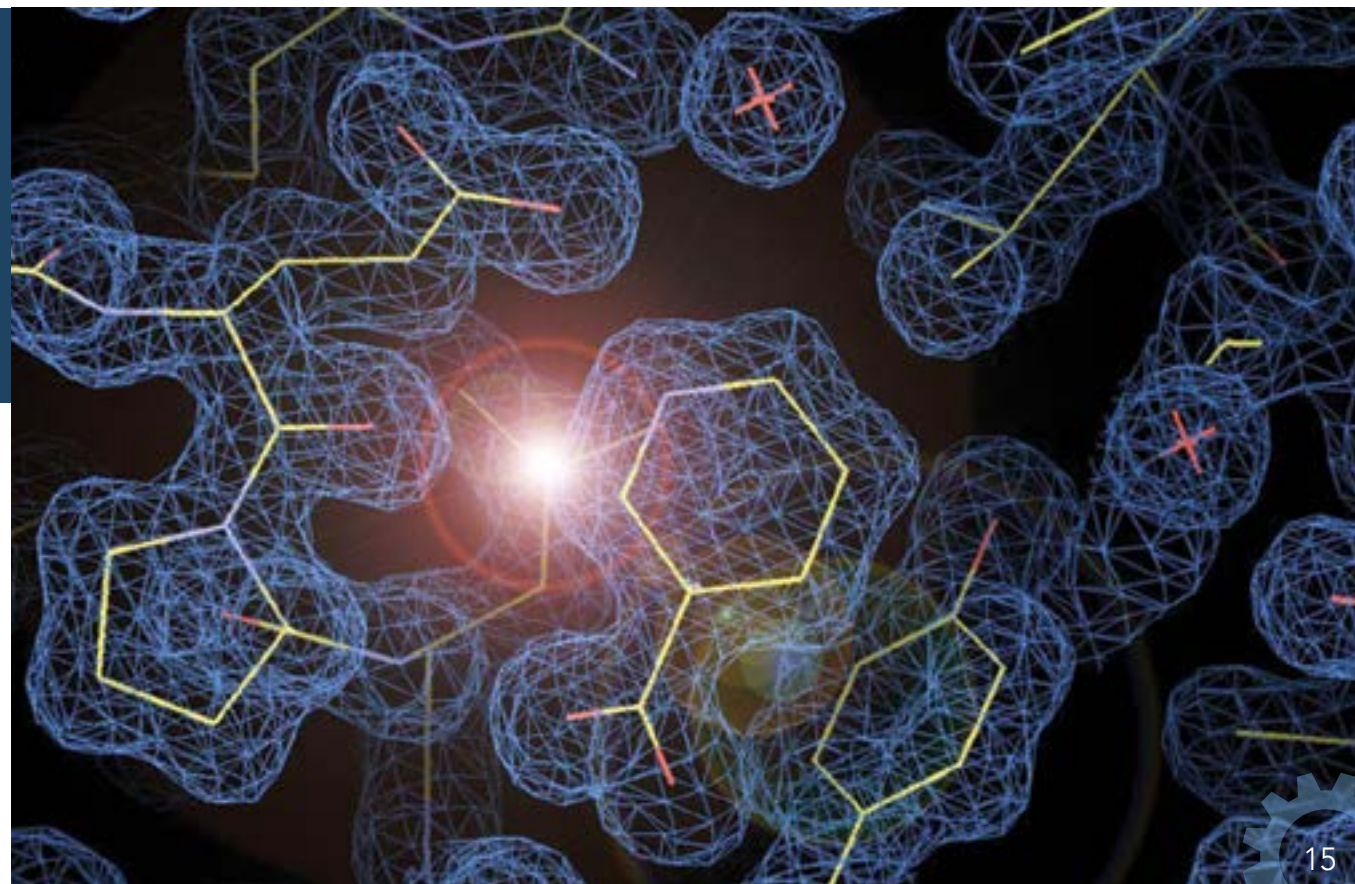
STRUCTURAL NMR RESOURCE

Location:	Ullmann B8	
Scientific Director:	David Cowburn, PhD (718) 430-8621 david.cowburn@einsteinmed.edu	
Operations Director:	Sean Cahill, PhD (718) 430-2035 sean.cahill@einsteinmed.edu	
Center Affiliation:	Montefiore Einstein Cancer Center	
Website:	www.einsteinmed.edu/r/structural-nmr	

The Structural NMR Resource provides access to high-resolution solution NMR spectrometers ranging from 300 MHz to 900 MHz in field strength. These are used for small molecule analysis and for studies of macromolecular structure, dynamics, and function. Trained associates are available to assist in the collection and interpretation of routine data, for training in instrument usage, for performing data processing and interpretation and to partner for more extended collaborative studies of protein or nucleic acid structure and dynamics. A course with a blend of lectures and labs is offered yearly for students who want to know the practical aspects of NMR and its applications in chemistry and biochemistry.

Services:

- Training for independent or guided use of all instruments
- Assisted acquisition and interpretation of NMR spectra
- “Walk-on” 300 MHz spectrometer (with multi-nuclear 5 mm probe)
- A 600 MHz spectrometer with high sensitivity cryogenic probe
- Access to 500, 700, 800 and 900 MHz spectrometers at the NY Structural Biology Center (all with cryoprobes) and solid state NMR including dynamic nuclear polarization (<https://nysbc.org/departments/nmr/nmr-department/>)
- Local computational resources for data processing and analysis, and for macromolecular structure calculation and simulation





Simone Sidoli, PhD

PROTEOMICS FACILITY

Location:	Ullmann 405
Scientific Director:	Simone Sidoli, PhD (718) 430-3475 simone.sidoli@einsteinmed.edu
Scientific Co-Director:	Steven C. Almo, PhD (718) 430-2746 steve.almo@einsteinmed.edu
Associate Scientific Director:	Louis M. Weiss, MD, MPH (718) 430-2142 louis.weiss@einsteinmed.edu
Operations Director:	Jennifer Aguilan, PhD (718) 430-3479 jennifer.aguilan@einsteinmed.edu
Center Affiliation:	Montefiore Einstein Cancer Center
Website:	www.einsteinmed.edu/r/proteomics



Scott Garforth, PhD

MACROMOLECULAR THERAPEUTICS DEVELOPMENT FACILITY

Location:	Price Center/Block Research Pavilion 274
Scientific Director:	Steven C. Almo, PhD (718) 430-2746 steve.almo@einsteinmed.edu
Operations Director:	Scott Garforth, PhD (718) 678-1146 scott.garforth@einsteinmed.edu
Operations Director: (Monoclonal Antibodies)	Matthew D. Scharff, MD (718) 430-3527 matthew.scharff@einsteinmed.edu
Technician: (Monoclonal Antibodies)	Susan Buhl (718) 430-2170 susan.buhl@einsteinmed.edu
Center Affiliation:	Montefiore Einstein Cancer Center
Website:	www.einsteinmed.edu/sr/mtdf



The Proteomics Facility, supported by the Laboratory for Macromolecular Analysis and Proteomics (LMAP), provides Einstein researchers with a comprehensive mass spectrometry resource for analysis of proteins, peptides and other selected families of biomolecules. Expert staff scientists are available to help plan and execute a successful proteomics based analysis. They also assist in data analysis, including statistics and data visualization.

Services:

- Identification and quantification of purified proteins and/or complex proteomes (label-free, SILAC, isobaric tagging)
- Determination of protein-protein interactions and protein-nucleic acid interactions
- Computational determination of regulated protein pathways, complexes and other networks
- Identification and quantification of protein post-translational modifications
- Determination of protein synthesis rate (turnover) as complementary quantitative dimension of protein abundance
- High-resolution analysis of metabolites, drugs, peptides and other small molecules
- Targeted assays and pharmacokinetics

The Macromolecular Therapeutics Development Facility (MTDF) provides expertise for directed development and optimization of protein-based therapeutics and supports high-throughput (HTP) automated development, analysis and production of protein reagents using a Bioemk FxP liquid handling workstation for HTP molecular biology and expression testing, a 96-well electroporation instrument (BTX) and a Perkin-Elmer cell::explorer robot in a BSL-2 enclosure for efficient tissue culture based applications. High throughput screening is enabled with a Das Elite automated ELISA platform and a Marathon Argus piezoelectric array printer. This automation is designed to provide Einstein researchers with the added leverage of robotics equipment and trained personnel to accelerate and scale up their projects, thereby obviating the need for individual investigators to set up and staff their own facilities for protein production.

Services:

- General cloning into a range of protein expression vectors (single through 96 well)
- Expression profiling – E. coli, insect, mammalian
- Large-scale and high-throughput growth of cells or bacteria expressing recombinant proteins
- High throughput transfection and lentiviral generation (including for arrayed CRISPR libraries)
- Generation of stable recombinant mammalian cell-lines (pools or clones)
- High throughput screening (array generation, ELISA)
- Classical and automated purification of recombinant proteins from culture supernatant
- Custom DNA and protein microarrays
- Generation of hybridomas making mouse and rat monoclonal antibodies
- Generation of isotype switched monoclonal antibodies





HISTOTECHNOLOGY AND COMPARATIVE PATHOLOGY FACILITY

Location: Price/Block 158 
Director: Marco A. Fragoso Garcia, PhD
 (718) 678-1111 marco.fragosogarcia@einsteinmed.edu
Operations Director: Laura Ramkissoon
 (718) 678-1535 or 1043 laura.ramkissoon@einsteinmed.edu
Center Affiliation: Montefiore Einstein Cancer Center
Website: www.einsteinmed.edu/sr/histopathology

Laura Ramkissoon

The Histology and Comparative Pathology Facility provides comprehensive histology and histopathology support to Einstein investigators and the Institute for Animal Studies. The facility performs most aspects of tissue evaluation, from necropsy to the final histological diagnostic evaluation. We support quality translational research by evaluating how the genetic background, environment and sex of the animal affects the study results or gene phenotype. The goal of the facility is to have a high quality histology service as well as a resource for understanding and translating in vivo data.

Services:

- Tissue Preparation-fixation or freezing, decalcification, and routine processing to paraffin embedding
- Full service necropsy, histology, and cryosectioning (including many special stains)
- Immunohistochemistry and enzyme histochemistry of tissue sections
- Necropsy and histopathology reports
- Rental cryostat and microtome
- Routine hematology on a variety of laboratory animal species



RODENT BEHAVIORAL EVALUATION CORE

Location: Kennedy 720 and 615 
Scientific Director: Mikhail Kislin, PhD
 (718) 430-8522 mikhail.kislin@einsteinmed.edu
Center Affiliation: Rose F. Kennedy Intellectual and Developmental Disabilities Research Center
Website: www.einsteinmed.edu/sr/rodentbehavioral

Mikhail Kislin, PhD


The Rodent Behavioral Core, supported by the Dominick P. Purpura Department of Neuroscience and the Rose F. Kennedy Intellectual and Developmental Disabilities Research Center, provides expert staff and equipment for testing the behavior of mice and rats. These tests are broadly applicable to the study of heritable and developmental disorders of cognitive function, sensorimotor disorders, psychiatric and affective disorders, metabolic disorders, cancer, neuropathological and infectious diseases, aging and reproductive function.

Services:

- Dedicated space, apparatus and software
- Expertise in design, analysis and execution of behavioral studies
- Assistance in the preparation of grants, manuscripts, posters, presentations and animal protocols
- Development of assays and models to suit specific needs
- Validated and reliable functional testing of rodents in a broad range of behavioral domains including: cognitive, affective/emotional, social, sensory, motor and reproductive outcomes



TISSUE ENGINEERING AND CELLULAR REPROGRAMMING CORE

Location: Kennedy 401 
Director: Mark Mehler, MD
 (718) 430-3543 mark.mehler@einsteinmed.edu
Associate Director: Sölen Gökhan, MD
 (718) 430-3542 solen.gokhan@einsteinmed.edu
Associate Director: Aldrin Molero, MD
 (718) 430-4229 aldrin.molero@einsteinmed.edu
Center Affiliation: Rose F. Kennedy Intellectual and Developmental Disabilities Research Center
Website: www.einsteinmed.edu/sr/tissueengineering

Mark Mehler, MD


The Core provides consultation, equipment, facilities and technical support for the generation and reprogramming of a wide range of viable embryonic and neural cell types in culture and in vivo and the analysis of integrative cellular, molecular and functional properties generated from these experimental paradigms. The core houses 2 six foot and 1 four foot Edgegard TC Laminar Flow Hoods, 2 Steril Gard III Biosafety Hoods, BSL2 facility, an EMS OTS-4000 Vibratome and 12 Forma Scientific Water Jacketed Tissue Culture Incubators equipped with separate O₂, CO₂, N₂ and additional gaseous mixture and temperature controls to support these services.

Services:

- In vitro dissociated cell culture, slice and organotypic and whole embryo cultures
- Embryonic stem (ES) cell experimental applications
- In vivo real-time ultrasound-guided embryonic and adult stereotactic implantation surgeries using Visual Sonics Vevo 770 High Resolution In vivo Imaging
- Human fetal cell experimentation
- Gene expression quantification using ABI Prism 7000 Real Time PCR and ABI 6100 RNA prep station
- Image analysis and data acquisition using Olympus BX51 and IX70 Fluorescent microscopes associated with 2 Cooke Sensicam QE CCD Digital Cameras



MicroPET FACILITY

Location: Gruss 305 
Administrative Director: Craig A. Branch, PhD
 (718) 430-8917 craig.branch@einsteinmed.edu
Scientific Co-Director: Wade Koba, BS, CNMT
 (718) 430-8581 wade.koba@einsteinmed.edu
Expert Advisor for MicroPET: Eugene Fine, MD, MS
 (718) 904-2639 eugene.fine@einsteinmed.edu
Website: www.einsteinmed.edu/sr/micropet

Wade Koba, BS, CNMT

The MicroPET facility, supported by The M. Donald Blaufox Laboratory for Molecular Imaging, and associated with the Gruss MRRC, is designed for pre-clinical investigations using MicroPET (positron emission tomography), SPECT (single photon emission tomography) and CT (computed tomography) examination of small animals to phenotype animal models using a wide variety of radiotracers. Facility staff can train investigators in the use of the tools of MicroPET and help design, implement, and interpret all studies. The goal of the facility is to provide investigators with quantitative and high impact pre-clinical images.

Services:

- ¹⁸F-Fluorodeoxyglucose (FDG): for analysis of cancers and their response to treatment, cardiac function and infectious disease
- ¹²⁴I in NIS-expressing tissues
- ⁶⁴Cu in quantitation of copper metabolism
- Longitudinal studies: Scientific/statistical benefit and reduced sacrifice of animals as they serve as their own controls
- Tc99m (MAA) Technetium macro-aggregated albumin for lung perfusion studies used with SPECT imaging
- Tc99m (SC) Technetium sulfur colloid for liver and bone marrow SPECT imaging
- Pilot studies
- Training of investigators in specialized data analysis software to allow independent analysis



HEALTH SPAN CORE

Location: Golding 502/503
Scientific Director: Derek M. Huffman, PhD
 (718) 430-4278 derek.huffman@einsteinmed.edu
**Operations Manager-
 Health Span Phenotyping:** Kai Mao, PhD
 (718) 839-7964 kai.mao@einsteinmed.edu
Center Affiliation: Einstein Institute for Aging Research
Website: www.einsteinmed.edu/r/health-span-core

Derek M. Huffman, PhD

The Health Span Core specializes in performing integrative phenotyping of health and function across multiple domains in rodent models of aging, leveraging our long-standing expertise in conducting sophisticated in vivo metabolic studies, hormonal assays, and specialized surgeries, including parabiosis, as well as functional assays for cognitive, behavioral and physical function.

Services:

- Specialty surgical procedures
- Consultation and design of MRI projects
- Rat metabolic cages and clamp studies
- Cognitive/behavioral assays
- Comprehensive health span and lifespan assessment
- Rodent aging and parabiotic tissue resource
- Hormonal assays (standard and multiplex)



ANIMAL HOUSING AND STUDIES FACILITY

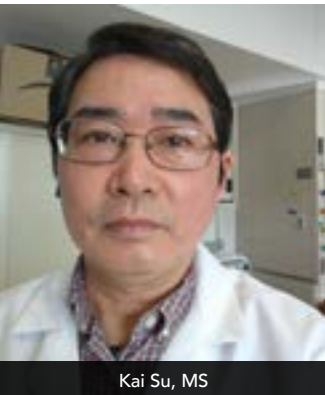
Location: Van Etten 460
Director: Lawrence Herbst, DVM, PhD, DACLAM
 (718) 839-7135 lawrence.herbst@einsteinmed.edu
Assistant Director: Tammy Rakowski-Anderson, DVM
 (Veterinary Clinical Care)
 (718) 839-7146 tammy.rakowski-anderson@einsteinmed.edu
Center Affiliation: Montefiore Einstein Cancer Center
Website: www.einsteinmed.edu/sr/animalhousing

Lawrence Herbst, DVM, PhD

The Animal Housing and Studies Core is housed in Einstein's Research Animal Care and Use Program facilities. The Core provides housing and husbandry services, health care and veterinary support, and regulatory oversight for all animals used in biomedical research and teaching at the college.

Services:

- Housing and husbandry for specific pathogen-free animals as well as conventional animals
- Isolation housing for animals exposed to biohazardous agents
- Gnotobiotic (flexible film isolator) housing and breeding of mice
- Quarantine and rederivation of mouse strains
- Diagnostic services (necropsy, histopathology, serology, microbiology, etc)
- Rodent quality assurance and outbreak eradication
- Veterinary care and consultation
- Investigator, staff, and student training
- Compliance with all local, state, and federal animal welfare regulations



MOUSE CARDIAC SURGERY AND PHYSIOLOGY CORE

Location: Forchheimer G45
Scientific Director: Nikolaos G. Frangogiannis, MD
 (718) 430-3546 nikolaos.frangogiannis@einsteinmed.edu
Operations Director: Kai Su, MS
 (718) 430-4354 kai.su@einsteinmed.edu
Website: www.einsteinmed.edu/sr/cardiacphysiology

Kai Su, MS

The Mouse Cardiac Surgery and Physiology Core supports Einstein investigators in delineating the impact of genes, drugs, and metabolites on cardiac function. The Core employs multiple approaches to analyze cardiovascular structure and function in wild-type and genetically-manipulated mice. The technically experienced staff of the Core performs the analyses and provides the data to the investigator. To the extent possible, training is also offered.

Services:

- Myocardial ischemia-reperfusion to induce myocardial infarction in vivo
- Permanent coronary artery occlusion to induce myocardial infarction in vivo
- Quantification of myocardial infarction size
- Echocardiography (M-mode and two-dimensional) for cardiac chamber size, wall thickness, and function
- Insertion of arterial (e.g. carotid) and venous (e.g. jugular) catheters for blood pressure and drug infusion
- Tail vein injections
- Implantation of osmotic minipumps for drug infusion (e.g. Alzet)



ZEBRAFISH CORE FACILITY

Location: Chanin 523
Scientific Director: Sofia de Oliveira, PhD
 (718) 430-4294 sofia.deoliveira@einsteinmed.edu
Zebrafish Technician: Clinton DePaolo, MSc
 (718) 430-4210 clinton.depaolo@einsteinmed.edu
Website: www.einsteinmed.edu/sr/zebrafish

Sofia de Oliveira, PhD

Zebrafish is a powerful system for studies of embryogenesis and to investigate mechanisms underlying human diseases. The zebrafish is particularly well suited to study complex and acquired diseases and to identify new disease genes owing to its genetic tractability, transparency of the organism, and the ease of conducting chemical screens to identify diagnostic and potential therapeutic targets. Moreover, the high degree of genetic conservation renders translation between fish and mammals a possibility. For example, this model system can be used to validate and characterize genome-wide association study (GWAS) candidates through gain of function and loss of function approaches. For loss of function analysis the candidate, the gene of interest can be transiently knocked down or stable mutant alleles can be generated through reverse genetic mutagenesis approaches. The phenotypes produced by the normal and mutant versions can provide an indication of the gene's function in development and disease. The Einstein zebrafish core was established to facilitate this type of analysis.

Services:


- Generation of transgenic or mutant zebrafish using reverse genetic approaches such as tol2-based transgenesis and CRISPR/Cas9-based mutagenesis
- Microinjection into one-cell stage embryos, larvae, and adults
- Maintenance of zebrafish lines





Louis M. Weiss, MD, MPH

IN VIVO IMAGING SYSTEM (IVIS) FACILITY

Location:	Ullmann 1005	
Scientific Director:	Louis M. Weiss, MD, MPH (718) 430-2142 louis.weiss@einsteinmed.edu	
Operations Director:	Tadakimi Tomita, PhD (718) 430-2143 tadakimi.tomita@einsteinmed.edu	
Website:	www.einsteinmed.edu/r/ivis	

The IVIS facility provides access to the the Caliper Life Sciences IVIS Spectrum intravital imaging system that enables longitudinal three dimensional intravital imaging of animals or tissue expressing bioluminescent (e.g. Firefly luciferase) or far red fluorescent probes. Einstein investigators have used the system to follow tumor growth, tumor metastasis and progression of infectious diseases. The facility is housed within BSL2 animal space. Please note that investigators planning to use the facility for imaging of whole animals must have their experimental protocol approved by the Animal Institute prior to any experiments being conducted.


Services:

- Intravital imaging of small animals
- Bioluminescence imaging (luciferase) of whole animals
- Far red fluorescence imaging of whole animals



Ken Chen, MD

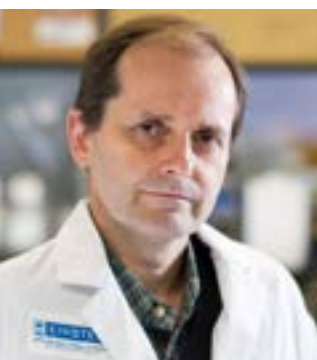
TRANSGENIC MOUSE FACILITY

Location:	Price/Block B110	
Scientific Director:	Winfried Edelmann, PhD (718) 678-1086 winfried.edelmann@einsteinmed.edu	
Operations Director:	Ken Chen, MD (718) 678-1106 ken.chen@einsteinmed.edu	
Center Affiliation:	Montefiore Einstein Cancer Center	
Website:	www.einsteinmed.edu/sr/transgenic	

The Transgenic Mouse Facility trains and assists Einstein investigators in the production and characterization of transgenic mouse strains. The personnel have over a decade of experience providing high quality service with minimal waiting times. The Transgenic Facility offers a wide array of mouse embryo-based services for the college including traditional pronuclear and lentiviral injections as well as consulting, construct design, and screening strategies.

Services:

- Pronuclear injection
- Embryo cryopreservation
- Lentiviral transgenesis
- Sperm cryopreservation
- In vitro fertilization
- Vasectomies
- Rederivation
- Miscellaneous small animal procedures



Winfried Edelmann, PhD

GENE TARGETING FACILITY

Location:	Price/Block 269	
Scientific Director:	Winfried Edelmann, PhD (718) 678-1086 winfried.edelmann@einsteinmed.edu	
Operations Director:	Yongwei Zhang, PhD (718) 678-1087 yongwei.zhang@einsteinmed.edu	
Center Affiliation:	Montefiore Einstein Cancer Center	
Website:	www.einsteinmed.edu/sr/genetargeting	

The Gene Targeting Facility is offering services for the complete generation of gene targeted mouse lines including the generation of conventional gene knockouts, conditional knockouts, knock-in (KI) mutations and the generation of tagged proteins by conventional homologous recombination based gene targeting strategies in embryonic stem (ES) cells or CRISPR mediated gene targeting strategies. CRISPR can shorten the time frame of gene targeted mouse production remarkably and the gene targeted mice can be generated as fast as in 2-4 months.

Services:

- Conventional KO mouse production by zygote injection of CRISPR/Cas9 system-C57BL/6
- Conditional (floxed) allele generation by zygote injection of CRISPR/Cas9 system-C57BL/6
- KI (small modifications, <50bp) mouse production by zygote injection of CRISPR/Cas9 system-C57BL/6
- Complex genetically engineered mouse production by zygote injection of CRISPR/Cas9 system-C57BL/6
- CRISPR/Cas9 founder breeding for germline transmission
- CRISPR/Cas9 founder off- target analysis
- Design and cloning of homology-directed donor constructs for CRISPR/Cas9 mediated genome engineering
- Generation of polyclonal KO cell lines - sgRNA/ Cas9 all-in-one plasmid based CRISPR Engineering
- Preparation of sgRNA/Cas9 all-in-one plasmid or sgRNA lentiviral cons
- Gene targeting vector construction
- ES cell electroporation and screening
- Chimera production for germline transmission



Gary Schwartz, PhD

ANIMAL PHYSIOLOGY CORE

Location:	Golding 501	
Scientific Director:	Gary Schwartz, PhD (718) 430-2263 gary.schwartz@einsteinmed.edu	
Technician:	Licheng Wu, MD (718) 430-2348 licheng.wu@einsteinmed.edu	
Center Affiliation:	Diabetes Research Center Rose F. Kennedy Intellectual and Developmental Disabilities Research Center	
Website:	www.einsteinmed.edu/sr/animalphysiology	

The Animal Physiology Core measures whole body and tissue-specific glucose sensitivity and insulin action using rodent models and analysis of whole body carbohydrate/fatty acid oxidation, energy expenditure, feeding behavior, and locomotor activity using specialized metabolic and behavioral rodent cages. It performs specialized measurements of rodent adipose tissue distribution, metabolites, and brain energy and glucose utilization. The facility staff provide instruction for investigators in designing and performing metabolic studies.

Services:

- Advising for students, postdoctoral fellows, investigators and technical staff on designing and performing physiologic approaches and techniques necessary to evaluate the control of glucose homeostasis and insulin action in rodents
- Measuring of whole body and tissue-specific glucose metabolism and insulin action in rodent models including insulin, pancreatic and hyperglycemic clamps and spontaneous glucose monitoring
- Specialized measurements of rodent adipose tissue distribution using magnetic resonance spectroscopy and microCT
- Specialized gastrointestinal, neurosurgical and histological models for the study of insulin sensitivity, energy balance, and glucose and fatty acid metabolism, including gastric bypass and adipose and hepatic tissue denervation, imaging and photo-stimulation
- Analysis of whole body carbohydrate/fatty acid oxidation, energy expenditure, thermogenesis, food intake, and locomotor activity using specialized metabolic (indirect calorimetry) rodent cages
- Assessment of the effects of diet, exercise, light/dark cycle and environmental temperature on glucose homeostasis, metabolism, and shivering via electromyography

CLINICAL, TRANSLATIONAL & IMPLEMENTATION SCIENCE CORE



Kathryn Anastos, MD

Location: Montefiore Medical Center 

Scientific Director: Kathryn Anastos, MD
(718) 515-2593 kanastos@montefiore.org

Associate Scientific Director for Clinical Research: Barry Zingman, MD
(718) 920-2647 bzingman@montefiore.org

Associate Scientific Director for Translational Research: Betsy Herold, MD
(718) 430-2974 betsy.herold@einsteinmed.edu

Associate Director for Clinical and Population Health Research: Howard Strickler, MD, MPH
(718) 430-4055 howard.strickler@einsteinmed.edu

Associate Director for Database Development: Mindy Ginsberg
(718) 430-3559 mindy.ginsberg@einsteinmed.edu

Center Affiliation: Einstein-Rockefeller-CUNY Center for AIDS Research

Website: www.einsteinmed.edu/sr/aidsclinical



Jeff LaFleur, MA

BIOREPOSITORY

Locations: Golding G02 and Block 00-04 

Scientific Director: Matthew Abramowitz, MD, MS
(718) 430-8566 matthew.abramowitz@einsteinmed.edu

Operations Director: Jeff LaFleur, MA
(718) 430-3314 jeff.lafleur@einsteinmed.edu

Center Affiliation: Harold and Muriel Block Institute for Clinical and Translational Research at Einstein and Montefiore Montefiore Einstein Cancer Center

Website: www.einsteinmed.edu/sr/biorepository

The Clinical, Translational and Implementation Science Core (CTISC) of the Einstein-Rockefeller-CUNY Center for AIDS Research (CFAR) provides a centralized, user-friendly gateway for accessing extensive patient data and specimens across clinical care and research sites. The Core facilitates research through a user-friendly portal to a large database, and stimulates interactions among CFAR investigators to promote translational research, and provides epidemiologic guidance and statistical support.

Services:

- Clinical outcomes database of ~15,000 HIV-infected and >217,000 HIV-negative patients seen at Montefiore Medical Center with key variables for both HIV-related and general medical conditions
- Epidemiology guidance in study design and analysis; statistical support when needed
- Access to a specimen repository from HIV-infected and –uninfected individuals, enabled through a general IRB-approved protocol that facilitates overall work and reduces time and expense
- Assistance in collection of fresh specimens from well-characterized patients and research participants
- Assistance in conducting behavioral research available through the Preventive Intervention Research Center for Child Health, directed by Laurie Bauman, PhD

The Einstein Biorepository provides long-term banking services for clinical research specimens. All samples are tracked and archived electronically, providing storage, retrieval and chain of custody information, while meeting GLP and FDA guidelines. Specimens can be linked to the EMR and/or other investigator provided clinical data. Our staff are trained and certified in sample aliquoting, storage, retrieval and packaging for shipping to other institutions.

Services:

- Long term storage of prospective clinical trial samples
- Services available to individual investigators or targeted consortia
- Sample types include blood, urine, tissue, DNA, mRNA, etc.
- Storage available at a variety of conditions: LN2, -80°C, 4°C, and room temperature
- Individual archiving and tracking on each vial in repository
- Bar coding of external samples
- Domestic and international packaging services for shipment (IATA certified)
- Cost competitive sample storage; additional volume discounts available
- Redundant freezer backup systems provided to ensure sample integrity





Matthew Abramowitz, MD, MS

BIOMARKER ANALYTIC RESEARCH CORE

Location: Golding G02, Forchheimer G19 and Moses Research Pavilion 4th Floor

Scientific Director: Matthew Abramowitz, MD, MS
(718) 430-8566 matthew.abramowitz@einsteinmed.edu

Operations Director: Jeff LaFleur, MA
(718) 430-3314 jeff.lafleur@einsteinmed.edu

Center Affiliation: Harold and Muriel Block Institute for Clinical and Translational Research at Einstein and Montefiore

Website: www.einsteinmed.edu/sr/barc



Sophie Molholm, PhD

HUMAN CLINICAL PHENOTYPING CORE

Location: Van Etten 1C-6

Scientific Director: Sophie Molholm, PhD
(718) 862-1823 sophie.molholm@einsteinmed.edu

Associate Director: Melissa Wasserstein, MD
(718) 741-2318 mwassers@montefiore.org

Head Clinical Neuropsychologist: Catherine Sancimino, PsyD
(718) 862-1831 catherine.sancimino@einsteinmed.edu

Center Affiliation: Rose F. Kennedy Intellectual and Developmental Disabilities Research Center

Website: www.einsteinmed.edu/sr/hcp

The Biomarker Analytic Research Core (BARC) provides uniform, accurate, and cost-effective specimen collection and biomarker analyses in support of research. The BARC assists in the handling of blood, tissue, and other sample processing. Specimens can then be analyzed internally or sent to another lab/core for measurement. Locations for processing include our laboratories at Einstein and Montefiore's Moses campus. BARC also carries out over 88 separate biomarker assays. The data is generated from various instrumentation and supports diverse methodologies.

Services:

- Routine processing of specimens including aliquoting, barcoding and ordering of testing through Montefiore pathology
- Courier transport of specimens between the Moses campus and Einstein. Also certified in IATA packing for shipment
- Hormone and cytokine measurements via ELISA /TRF
- Lipid and routine chemistry measurements via UV/Vis
- Automated methods for measurement of multiple markers from one source specimen
- Chromatography/Mass Spectrometry instrumentation for high sensitivity measurement of hormones and stable isotope dilution assays.

The objective of the Human Clinical Phenotyping Core (HCP) is to facilitate research on intellectual and developmental disabilities (IDD) by Einstein investigators. The HCP core maintains a centralized, easily searchable, de-identified database of over 2000+ participants (mostly children) that features extensive participant information to identify candidates for research projects, develop hypotheses for new projects, and generate low-cost pilot data for grant applications. The Core works to develop novel phenotyping tools and aims to rapidly respond to novel needs of IDD investigators to work toward the development of biomarkers for IDDs.

Services:

- Consultation on optimal set of neuropsychological tests for program of research
- Expert staff to assist with participant recruitment, study design and coordination, and IRB applications
- Research-grade clinical diagnosis
- Access to de-identified participant database
- Remote clinical and behavioral data collection services
- Neuropsychological testing including cognitive testing adapted to age and cognitive ability, adaptive behavior scales, measures of language, attention, and motor skills, and diagnostic instruments and scale
- Collection of biosamples and storage in biorepository
- Turnkey access to state-of-the-art human neuroimaging via the Gruss Magnetic Resonance Research Center, including eye-tracking and high-density EEG recordings



Laurie J. Bauman, PhD

BEHAVIORAL AND IMPLEMENTATION SCIENCE CORE

Location: Van Etten 6B25

Scientific Director: Laurie J. Bauman, PhD
(718) 862-1747 laurie.bauman@einsteinmed.edu

Associate Scientific Director: Bruce D. Rapkin, PhD
(718) 920-5814 bruce.rapkin@einsteinmed.edu

Center Affiliation: Einstein-Rockefeller-CUNY Center for AIDS Research

Website: www.einsteinmed.edu/r/behavioral-science-core



Jeffrey S. Gonzalez, PhD

CENTER FOR DIABETES TRANSLATION RESEARCH

Location: Belfer 705A

Scientific Directors: Jeffrey S. Gonzalez, PhD
(646) 592-4506 jeffrey.gonzalez@einsteinmed.edu
Judith Wylie-Rosett, EdD, RD
(718) 430-2646 judith.wylie-rosett@einsteinmed.edu

Center Coordinator: Jennifer Lukin, BS
(718) 430-3400 jennifer.lukin@einsteinmed.edu

Center Affiliation: Diabetes Research Center

Website: www.einsteinmed.edu/r/diabetes-translational-research

The Behavioral & Implementation Science Core (BISC) of the Einstein-Rockefeller-CUNY Center for AIDS Research (CFAR) facilitates the development and implementation of interdisciplinary, theory-driven, rigorous behavioral and implementation science research that aligns bench, bedside and community to prevent new HIV infections and improve HIV care.

Services:

- Provide technical assistance and training on all aspects of qualitative and mixed-methods behavioral research including study design, data collection, implementation, analysis and manuscript preparation
- Provide technical assistance and training on cognitive interviewing: a tool used to evaluate and improve quantitative survey measures so they capture what is intended within different contexts and populations
- Facilitate adoption of implementation science approaches, methods, and frameworks to expand and strengthen HIV research, while focusing on strategies that mitigate health disparities and increase equity
- Community Participatory Partnership (CPP): The BISC facilitates partnerships between CFAR investigators and community members, CBOs, and NYC Department of Health and Mental Hygiene to maximize community-relevant research

The Center for Diabetes Translation Research (CDTR) is designed to increase collaboration and enhance communication among investigators from multiple institutions and diverse disciplines that span translational spectrum and address various levels of social-ecological issues. The CDTR resources facilitate implementation and dissemination research for effective community, individual, clinical, and public health programs.

Services:

- Developing diabetes-related research questions/hypotheses supported by behavioral theory and empirical evidence; using community-engaged methods for planning and implementing intervention
- Facilitating access to large datasets and claims data for obesity/diabetes research
- Developing research that address life-course questions
- Supporting diabetes research within the HCHS/SOL Cohort and within other existing or newly recruited Latino cohorts



Craig A. Branch, MS, PhD

GRUSS MAGNETIC RESONANCE RESEARCH CENTER

Location: MRRC Building 2nd Floor 

Director: Craig A. Branch, MS, PhD
(718) 430-8917 craig.branch@einsteinmed.edu

Associate Medical Director: Jimmy S. Lee, MD, PhD
(718) 920-4030 jilee@monefiore.org

Associate Director for Image Analysis: David Zhu, PhD
david.zhu@einsteinmed.edu

Center Affiliation: Rose F. Kennedy Intellectual and Developmental Disabilities Research Center

The center supports both human MR imaging and Spectroscopy and animal MRI, PET/SPECT and CT research including structural, functional, physiological, molecular, spectroscopy and chemical shift imaging as well as data processing.

Services:

Human Research:

- Human imaging and spectroscopy using the 3.0 Tesla Philips Ingenia Elition
- Consultation and design of MRI projects
- Collaborative effort on funding applications
- Support for image analysis – including available automated analysis pipelines
- Support for pilot projects for external funding (see the Shared Facilities and Cores Web Page)


Animal Research:

- Small animal imaging (MRI/PET/SPECT/CT) and spectroscopy
- Multimodality imaging services (MRI: PET)
- Consultation and design of MRI projects
- Collaborative effort on funding applications
- Support for image analysis – including available automated analysis pipelines



Minka Chikolareva, RN, BSN, MS

CLINICAL RESEARCH CENTER

Locations: Van Etten Building 4th Floor B Wing, MMC/Moses Research Pavilion 4th floor 

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Center Affiliation: Harold and Muriel Block Institute for Clinical and Translational Research at Einstein and Montefiore

Website: www.einsteinmed.edu/sr/clinicalresearch

The Clinical Research Center (CRC) provides centralized clinical research infrastructure for investigators in multiple disciplines. The CRC research unit serves pediatric and adult patient-oriented research, including first-in-human studies, mechanistic and integrative physiology, clinical trials, and behavioral studies. A mobile team of clinical research staff supports investigators with studies conducted at point-of-care sites.

The new CRC facility in the Van Etten building features 6 patient exam rooms; a procedure suite for intensive protocols which require multiple blood drawings and close patient observation, staff offices, and a full kitchen where the fasting patients can eat. The CRC facility on the Moses campus features 4 patient exam rooms and staff offices. Both facilities have patient care staff and laboratory specimen handling personnel 5 days a week.

Services:

- Outpatient units providing investigators and research subjects with comfortable surroundings for physical exams, procedures, private interviews and data collection
- Experienced research staff who work in partnership with investigators to implement and complete protocols
- A study suite at for lengthy infusion, biopsy and exercise protocols
- Saturday appointments available on an as-needed basis



Yvonne Saenger, MD

IMMUNE MONITORING CORE

Location: Golding 701 

Scientific Director: Yvonne Saenger, MD
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Operations Director: Lawrence Leung, PhD
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Center Affiliation: Montefiore-Einstein Cancer Center

Website: www.einsteinmed.edu/r/immune-monitoring

Starting with formalin-fixed paraffin embedded tissues, the Immune Monitoring Core uses the Vectra Polaris automated slide scanner and NanoString GeoMx Digital Spatial Profiler (DSP) to shed light on the molecular and cellular features of the tumor microenvironment. The Vectra Polaris performs multispectral imaging of 6 markers across 40 slides in a single run. Rapid, unambiguous phenotyping and spatial distribution of immune cells, tumor and stroma can be achieved with minimal hands-on work by the investigator. Spatial RNA sequencing from discrete individual regions of interest comprising a few hundred cells can be accomplished using the GeoMx DSP. This allows the investigator to quantify up to 800 unique transcripts.


Services:

- Whole slide scanning with multispectral separation
- Nanostring nCounter Analyzer
- GeoMx digital spatial profiler



Joan W. Berman, PhD

BIOMARKERS & ADVANCED TECHNOLOGIES CORE

Location: Forchheimer 727 

Scientific Co-Director: Joan W. Berman, PhD
(718) 430-2587 joan.berman@einsteinmed.edu

Scientific Co-Director: Steven C. Almo, PhD
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Center Affiliation: Einstein-Rockefeller-CUNY Center for AIDS Research

Website: www.einsteinmed.edu/sr/biomarkers

The Biomarkers & Advanced Technologies Core provides an extensive array of support services ranging from the measurement of a wide range of biomarkers to the molecular quantification of HIV DNA and RNA to the development and implementation of specialized high-throughput assays focused on supporting basic, translational, clinical, and epidemiological ERC-CFAR investigators engaged in the ERC-CFAR mission to prevent, treat, and eradicate HIV-1 infection.

Services:

- Analysis of sera, plasma, CSF, cervical-vaginal lavage fluid, tissue culture supernatants and cell lysates from humans, rodents and macaques for quantification of biomarkers such as cytokines/chemokines, growth factors and other mediators using high-throughput multiplex platforms and focused ELISAs
- Full support for a wide range of molecular assays for evaluating HIV infection including RT-qPCR and digital PCR for quantification of HIV viral RNA and DNA and for the quantification of the latent HIV-infected cell population
- Access to the Case Western CFAR Virology, Next Generation Sequencing and Imaging Core (<http://casemed.case.edu/cfar/cores/virology>) for support for studies requiring deep HIV sequencing and mutational analysis in laboratory and clinical isolates
- Production of large quantities of purified proteins in eukaryotic or prokaryotic expression systems for in vivo studies requiring large quantities of biological proteins including specific cytokines, chemokines and monoclonal antibodies



HEPATIC IMAGING AND CELL STRUCTURE CORE

Location: Ullmann 614

Director: Carolina Eliscovich, PhD
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Training Director for Electron Microscopy: Frank P. Macaluso, MSc
(718) 430-3547 frank.macaluso@einsteinmed.edu

Center Affiliation: Marion Bessin Liver Research Center

Website: www.einsteinmed.edu/sr/hepimaging

Carolina Eliscovich, PhD

The Imaging and Cell Structure Core provides expertise in microscopy of liver tissue and liver cell cultures. The Core facilitates access to state-of-the-art microscopes and provides training and assistance with a broad range of tissue- and cell-based methods. In addition, advice is provided on which microscopes and methods are appropriate for imaging normal and pathologic liver in real and fixed times and at different levels of tissue and cell organization (i.e., from overall topography to subcellular structures and molecular composition).

Technologies and Services:

- State-of-the-art light and electron microscopy such as standard fluorescence microscopy, laser scanning confocal microscopy, super resolution microscopy, multi-photon microscopy, light-sheet microscopy, transmission electron microscopy, scanning electron microscopy, cryo-electron microscopy, and correlative light and electron microscopy
- Training and assistance with sample preparation and experimental design on advanced high resolution microscopy techniques applied to liver studies including vesicle tracking, ultrastructural sample preparation, single molecule Fluorescence in situ Hybridization (smFISH), Fluorescence Recovery After Photobleaching (FRAP), Fluorescence Resonance Energy Transfer (FRET), and in vivo intravital microscopy (IVM)
- Access to and expertise in a variety of fluorescence labeling technologies optimized for liver studies including fluorescent recombinant fusion proteins, biosensors, antibodies, RNA FISH probes, organelle markers and cell dyes
- Expertise and assistance with image analysis



Nir Barzilai, MD

CHRONOBIOSIS AND ENERGETICS/METABOLISM OF AGING CORE

Location: Belfer 701

Scientific Co-Director: Nir Barzilai, MD
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Center Affiliation: Paul F. Glenn Center for the Biology of Human Aging
Nathan Shock Center of Excellence

Website: www.einsteinmed.edu/r/ceac

The Chronobiosis and Energetics/ Metabolism of Aging Core (CEAC) offers intellectual expertise specific to the design, implementation and interpretation of studies targeting the understanding of energetics and metabolic consequences and mechanisms specific to aging.

Services:

- Intellectual expertise specific to the design, implementation and interpretation of studies targeting the understanding of energetics and metabolic consequences and mechanisms that are specific to aging
- Use of cutting-edge technologies to advise or assist investigators in performing in vivo energetics/metabolism and chronobiosis assessments
- Access to a plasma and tissue chronobiosis resource which includes a discovery panel database consisting of proteomic, transcriptomic and metabolomic data from isochronic and heterochronic pairs



Jayanta Roy-Chowdhury, MBBS, MRCP

GENETIC ENGINEERING AND GENE THERAPY CORE

Location: Ullmann 525

Scientific Director: Jayanta Roy-Chowdhury, MBBS, MRCP
(718) 430-2265 jayanta.roy-chowdhury@einsteinmed.edu

Operations Director: Xia Wang, MD, PhD
(718) 430-3018 xia.wang@einsteinmed.edu

Center Affiliation: Marion Bessin Liver Research Center

Website: www.einsteinmed.edu/sr/genetherapy

The Genetic Engineering and Gene Therapy Core (GEGT) provides access to an expanded array of customized viral and non-viral vectors, cell marking and reprogramming services, and state-of-the-art reagents for site-specific gene insertion. The mission of the GEGT Core is to work cooperatively with investigators to facilitate the development of genetic engineering reagents required for their in vitro and in vivo experiments.

Services:

- Generating recombinant viral vectors such as adenoviral, adenoassociated viral, oncoretroviral and lentiviral vectors, as well as special non-viral vectors
- Providing premade and customized viral or non-viral vectors to investigators
- Generating genetically marked cell clones
- State-of-the-art reagents for site-specific gene insertion for cell marking, phenotypic correction/modification or down-regulation of gene expression
- Training, consultation and educational services



Ana Maria Cuervo, MD, PhD

PROTEOSTASIS OF AGING CORE

Location: Golding 701

Scientific Director: Ana Maria Cuervo, MD, PhD
(718) 430-8975 ana-maria.cuervo@einsteinmed.edu

Technician: Antonio Diaz
(718) 430-2091 antonio.diazcarretero@einsteinmed.edu

Center Affiliation: Paul F. Glenn Center for the Biology of Human Aging
Nathan Shock Center of Excellence

Website: www.einsteinmed.edu/r/proteostasis-of-aging

Alterations in proteostasis are linked to age-related disorders and other aging mechanisms such as molecular damage, cellular responses to stress, metabolism, inflammation and stem cell function. Genetic interventions in invertebrates and mammals show that modulating intracellular pathways for proteostasis, chaperones, and proteolytic systems can benefit life- and health-span. Translation of these findings into humans requires: 1) characterizing proteostasis changes in old organisms; 2) understanding the molecular mechanisms behind proteostasis loss and 3) testing chemical and natural compounds' effects on the proteostasis machinery and their future development into drugs.

Services:

- Assays: Autophagy profiling, LC3-II flux, Protein turnover, Electron microscopy and morphometry, Lysosomal functions, Enzymes assays
- Reagents and Samples: Autophagy antibody panel, Autophagy reporters, Lysosomal markers
- Consulting: Autophagy methods and assays and Drug developments and design



Shailesh M. Shenoy, BS

HIGH PERFORMANCE COMPUTING CORE FACILITY

Location: Price/Block B134
Operations Director: Shailesh M. Shenoy, BS
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Website: www.einsteinmed.edu/sr/hpc

The High Performance Computing Core (HPC) serves the Einstein scientific community by providing access to large scale computational resources, storage arrays and expertise. The physical resources include serial cluster nodes, large memory and parallel systems, scheduling systems and advanced network connections, which allow the flow of bench data to HPC computational resources. The HPC Core also maintains a layered software collection that serves a wide range of scientific needs.

Services:

- HPC computational and storage services:
 - ♦ Provisioning high memory computation (256GB per node), MPI and OMP programming styles, array jobs, serial swarms, parallel visualization tools
 - ♦ Embedded database client applications, batch and interactive services and Aspera clients for outside sequence access
- Design/implementation: solutions for complex research workflows that require data movement from laboratory instrumentation to large-scale computational and analytical resources
- Application/software management: licensing, compiling, optimizing and troubleshooting scientific applications
- Hardware management: design, purchase, install and manage computational equipment and storage resources
- Training: aid in the analysis of data through tutorials covering basic and advanced HPC methodologies
- Grant review: evaluate and recommend computational requirements to be included in grant proposals
- File-share services: offer file-share services to investigators' desktop units



Parsa Mirhaji, MD, PhD

CLINICAL RESEARCH INFORMATICS

Location: Block 536
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Director of Operations: Jeannette Lindquist, MBA
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Center Affiliation: Harold and Muriel Block Institute for Clinical and Translational Research at Einstein and Montefiore
 Montefiore Einstein Cancer Center
Website: www.einsteinmed.edu/sr/researchinformatics

The Clinical Research Informatics Core provides essential data management, informatics, data science, software engineering, and Real World Data collaborations, supporting clinical, translational, and basic science researchers across Einstein and Montefiore. Its mission is to facilitate use of data, advanced analytics, and informatics to facilitate study and understanding of biological processes, diseases, and personal and population level dynamics that may lead to hypothesis generation, discovery, and understanding of experimental or observational data. The staff of health informaticians, data scientists, data analysts, software engineers possess a unique set of skills to ensure proper handling and analysis of research needs and development of well-designed data management systems and analytic tools.

Services:

- Collaboration and consultation with investigators in developing research methods, and study design leveraging best practices in informatics, data science and data management
- Informatics support for access, extraction, and processing of observational data from clinical systems (EHR, PACS, Devices, Patient Generated Health Data, Waveforms)
- Provision and support of a software "toolchest" for secure data capture for research, self-service cohort analysis
- Support investigators with data science research (AI/ML) for predictive modeling using high resolution clinical data
- Support for biospecimen annotation and linkage with clinical data
- Integration of data from disparate sources, data harmonization, and transformation conforming to national standards to facilitate intra- and extramural collaboration
- Developing informatics infrastructure for pragmatic clinical trials, Integration of research to EHR and other clinical systems and Mobile Health
- Natural language processing, and use of clinical text for advanced analytics and research
- Develop computable inclusion/exclusion criteria, automated case screening, identification, contact and recruitment platforms for clinical trials





BIostatISTICS SHARED RESOURCE

Location: Belfer 1303
Scientific Director: Xiaonan (Nan) Xue, PhD
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Center Affiliation: Montefiore Einstein Cancer Center
 Harold and Muriel Block Institute for Clinical and Translational Research at Einstein and Montefiore
Website: www.einsteinmed.edu/sr/biostatistics

The Biostatistics Shared Resource provides statistical consultation and collaboration to Einstein investigators on all phases of basic science, translational, observational, and clinical research. Faculty and staff have a wide range of methodologic expertise including clinical trials, epidemiologic methods, survival analysis, statistical genetics, and the analysis of microarray experiments.

- Services:**
- Study design: determination of the appropriate experimental design; selection of study population; outcome definitions; sample size calculations; strategies for data monitoring
 - Protocol and grant development: formulation of hypotheses and specific aims, devising the analytic plan
 - Study conduct: randomization methods, development of data collection instruments, patient tracking and follow-up procedures, interim monitoring for safety and efficacy
 - Data presentation and analysis: identification of appropriate graphical and statistical approaches for presenting, summarizing and analyzing data including microarray data
 - Assistance in manuscript preparation

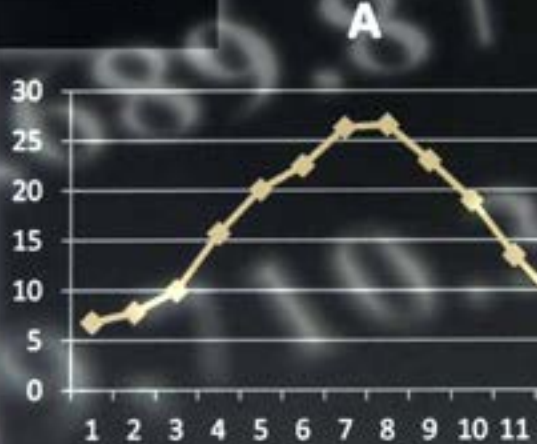
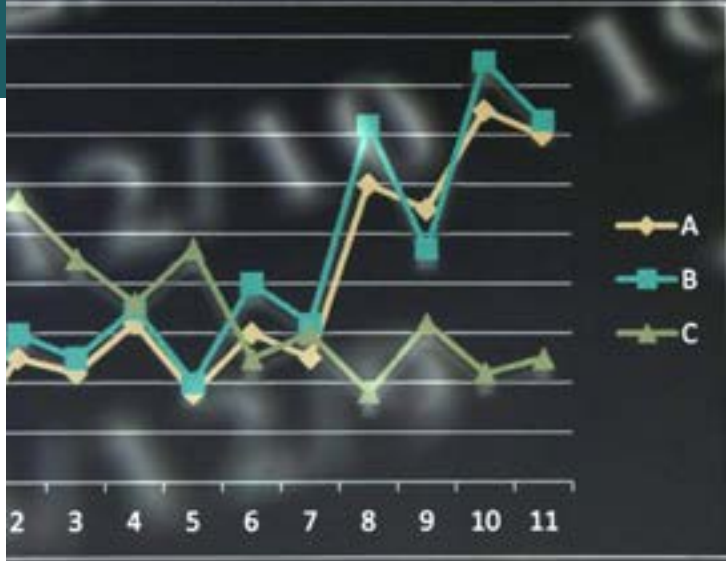
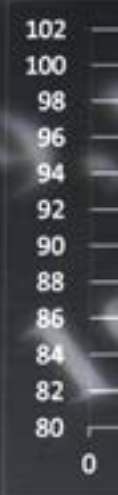
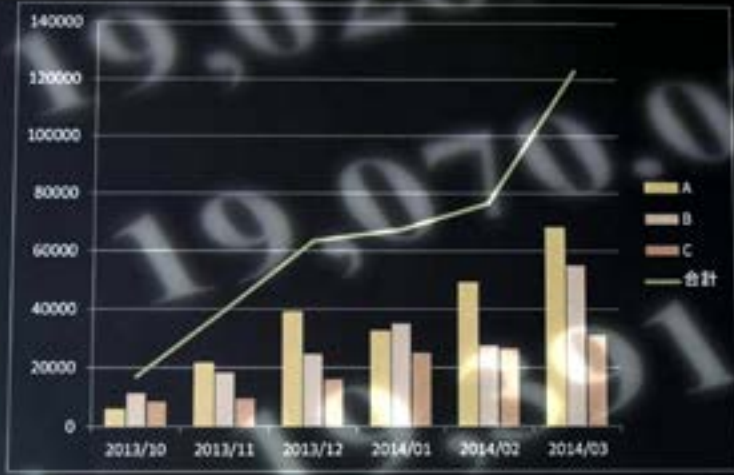
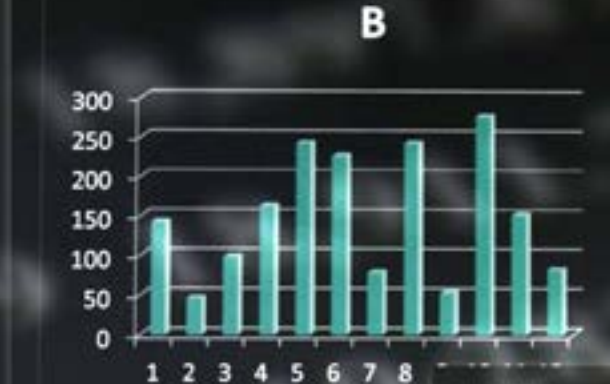


EPIDEMIOLOGY STUDY MANAGEMENT AND INFORMATICS

Location: Belfer 1313
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Operations Director: Mindy Ginsberg
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Center Affiliation: Montefiore Einstein Cancer Center
Website: www.einsteinmed.edu/r/epidemiology-informatics

The Epidemiology Study Management and Informatics Resource provides expertise and services to develop Study Management Systems which facilitate study operations, database management and quality assurance. These systems provide a comprehensive solution for managing research protocols by automating study operations, creating data collection instruments, establishing quality control and data validation procedures and implementing web-based scheduling and tracking systems. Reporting services also provide investigators with the ability to run basic statistical programming and descriptive analyses on study data.

- Services:**
- Develop and administer secure web-based comprehensive study management systems
 - Prepare operations management protocols and data system documentation for grant applications/studies
 - Design extensive quality control and data tracking procedures
 - Provide comprehensive study data integration for analysis by the Biostatistics Shared Resource
 - Serve as data coordinating center for multi-center studies
 - Provide descriptive analyses and customized programming
 - Provide data management training seminars to faculty and students



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Albert Einstein College of Medicine

Montefiore

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