



Research Facilities

**Available at
Lankenau Institute for
Medical Research
Wynnewood, PA**



www.limr.org

About Lankenau Institute for Medical Research (LIMR) and ACAPRENEURIAL™ services

LIMR is a nonprofit biomedical research institute located on the campus of Lankenau Medical Center, Wynnewood, Pa., and is part of Main Line Health, an integrated health system serving the Philadelphia region, with more than 2,000 physicians and four hospitals.

Founded in 1927, LIMR's mission is to improve human health and well-being.

Using its ACAPRENEURIAL™ model that integrates academic and entrepreneurial approaches, faculty and staff are devoted to advancing innovative new strategies to address formidable medical challenges including cancer, cardiovascular disease, tissue regeneration, gastrointestinal disorders and autoimmune diseases such as diabetes and arthritis.

LIMR's principal investigators conduct basic, preclinical and clinical research, using their findings to explore ways to improve disease detection, diagnosis, treatment and prevention. They are committed to extending the boundaries of human health through technology transfer and training of the next generation of scientists and physicians.

LIMR is located in a modern, 53,000-square-foot, three-story building contiguous with Lankenau Medical Center, just outside of Philadelphia. The integral connection of the hospital and LIMR creates a unique environment to build and maintain collaborations between research faculty and clinicians.

For more information, visit limr.org.



**Lankenau Institute for Medical Research
100 East Lancaster Avenue
Wynnewood, PA 19096 USA**

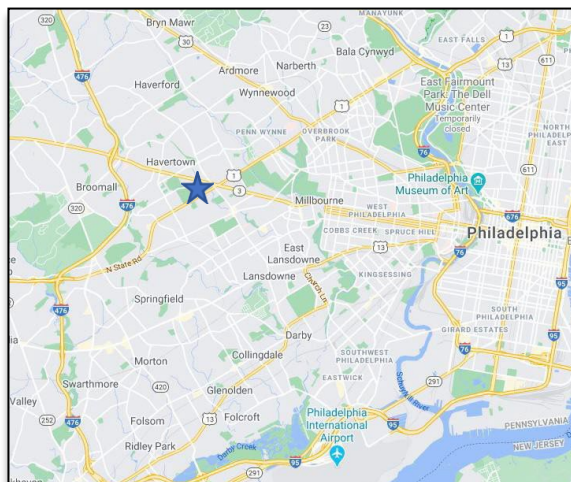
Why choose LIMR to advance your research?

We can customize your costs based on your specific needs.



Our location just over the county line from Philadelphia, in beautiful Montgomery County, PA, saves you additional costs over city-based facilities while still being convenient to major commuting roadways.

If your future plans are to focus on clinical studies, we have a robust clinical trials infrastructure in a hospital setting with full staffing support in place.



You will find a welcoming environment at LIMR with investigators who are experienced in scientific collaborations.



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LIMR Labs Include

Each lab at LIMR is equipped with the following:

- 1 chemical fume hood
- 2 biological safety cabinets with central vacuum and gas
- 2 CO₂ incubators connected to central CO₂ supply

Basic equipment in each lab:

- micro-centrifuge
- vortex
- DNA and protein electrophoresis equipment with power supplies
- balance
- shakers
- water baths
- Western blot equipment
- pH meter
- hot/stir plates
- calibrated pipettes
- oven
- microwave
- spectrophotometer
- refrigerator and freezer



Each lab has designated office space (110 square-foot). Shared lab desk space for technicians, research associates, students, and postdoctoral fellows are available within the lab and in an open office area at LIMR to allow for proper social distancing.



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Common Equipment

LIMR employs a full-time scientific operations manager who is skilled at installing, repairing and maintaining lab equipment. LIMR also employs personnel for glasswash, receiving, and distributing reagents, samples and equipment upon delivery. Common equipment includes the following:

Bacterial

- (2) bacterial incubators
- (2) bacterial New Brunswick i2500 series incubated shakers

Cell biology

- Branson Ultrasonics Sonifier 450 cell disruptor/homogenizer
- High-throughput 96-Well Perkin Elmer FilterMate Universal Harvester
- CytoPulse Electroporation system PA-4000
- Genetix ClonePix FL hybridoma screener

Centrifugation

- (2) Sorvall RC5B superspeed centrifuges
- (1) Sorvall RC5C Plus superspeed centrifuge
- (2) Beckman L-70 and L-80 ultracentrifuges
- Eppendorf 5810R centrifuge
- ThermoScientific Legend X1R
- Beckman Allegra 6R centrifuge
- ThermoScientific SPD111V Speedvac concentrator

General scientific

- (2) 80-square-foot 4°C cold rooms
- (2) dry ice distribution bins
- (2) Follett 300-22 ice machines
- (3) Steris SV-1262 autoclave sterilizers
- (3) Ultra-pure DI laboratory water systems generating 18.2 megohm water
- Balances, scales, pH meters

Irradiator

An RS2000 RAD source X-ray irradiator allows for irradiation of biological samples and/or small animals.



Molecular biology

- Eppendorf MasterCycler gradient
- (2) ABI SimpliAMP
- ABI QuantStudio 3 qPCR system
- NanoDrop 2000
- Qubit 3.0 fluorometer
- (2) BioRad ChemiDoc MP
- Thermo Fisher Scientific LTQ Orbitrap XL ETD LC Mass Spectrometer

Radioisotope analysis

- Perkin Elmer TriCarb 4910 TR
- Packard Cobra II auto-gamma counter
- Packard TopCount NXT microplate scintillation and luminescence counter



Protein characterization

- Agilent 1100 HPLC with fluorescence detection module
- Varian ProStar HPLC with UV/Vis with IN/US bRAM Model 2 flow-through detector
- GE FPLC with 4°C cabinet
- Sapidyne KinExA 3000 autosampler
- BioTek Synergy 2
- BioTek Cytation 3: includes CO₂ and O₂ environmental module
- Virtis FreezeMobile 3+SL Lyophilizer

Cryogenics Core

LIMR's 500-square-foot cryogenics facility is available for archived storage of samples and cell lines.

Equipment Available

- Six (6) large, computer-monitored, liquid nitrogen-supplied freezers connected to a bulk liquid nitrogen tank that is remotely monitored by Airgas Inc.
- A manual fill station for liquid nitrogen on demand
- Multiple -80°C and -20°C freezers connected to generator backup with computer monitoring to ensure uninterrupted operation
- Rodent cryopreservation services for sperm/embryos



Flow Cytometry Core

Equipment Available

- BD FACSCanto II flow cytometer containing 488nm solid state and 633nm HeNe lasers with 6-color capability
- BD FACSaria III cell sorter containing 405nm, 488nm, 561nm and 633nm HeNe lasers with 12-color capability
- Amnis ImageStreamX Mark II imaging cytometer, equipped with 405nm, 488nm, 561nm, 642nm and 785nm lasers, and 20x, 40x and 60x objectives



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Imaging Core

A wide range of microscopes and image analysis software is available to support researchers at LIMR with dark-phase, light-field and fluorescence microscopy.

Equipment Available

- (3) Wild M3Z dissecting microscopes
- Leitz Labovert inverted compound microscope with micromanipulator
- Nikon Diaphot inverted compound microscope with micromanipulator
- Axioplan and IMT-2 photomicroscopes
- Zeiss Axioplan phase contrast fluorescent microscope
- Zeiss Axioscop 20 fluorescent microscope with Optronics DEI 750 video camera
- Olympus BX60 fluorescent/brightfield microscope
- Olympus BH2 fluorescent/brightfield microscope with automated prior stage for cell counting
- Canon BX60 fluorescent microscope
- Nikon SMZ1500 fluorescence dissecting stereoscope with DXM1200F camera
- Zeiss Axioplan brightfield-fluorescent microscope
- Zeiss Phase epifluorescence and deconvolution microscope
- Nikon C2 confocal system on a TiE inverted microscope



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Vivarium Core

The Animal Care and Use Program at LIMR is fully accredited by AAALAC International since 1983 and has the distinction of being given Emeritus status by AAALAC International in 2006. The LIMR Animal Facility consists of a 6,400-square-foot space directly connected to the LIMR laboratory building. The facility contains:

Equipment Available

- (3) spacious general rodent housing rooms
- a barrier housing suite for mice
- cryopreservation services for rodents
- breeding services and minor procedure
- services
- rabbit housing room
- (2) procedure rooms between general housing rooms
- animal imaging suite with imaging room and imaging housing room
- biosafety suite consisting of a biosafety room equipped with a BLS2-level hood and a UVB setup, including a bank of 6 fluorescent lamps and radiometer with an adjacent animal housing room
- Perkin Elmer MicroCT
- VisualSonics Vevo 2100
- CODA Rodent Blood Pressure Monitoring System



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continued

Vivarium Core (*cont'd*)

Mice are housed in micro-isolator cage units. Immunocompromised mice are housed under SPF conditions in the Opti Mice cage units. Separate rooms are available for feed and bedding storage, clean rack and cage storage, and quarantine. A wash area containing a pass-through rack washer, tunnel washer and sterilizer directly connects to the storage room.

A state-of-the-art system controls and monitors environmental parameters (e.g., temperature, humidity, air flow, light cycles) in all rooms in real time, and maintains a continuous electronic log. Access to the facility and all rooms are controlled by both a card reader and a touch pad system.

Veterinary care programs are overseen by a Veterinary Consultant on call 24 hours a day. A supervisor and three animal care technicians are employed by LIMR to manage the facility. In the vivarium:

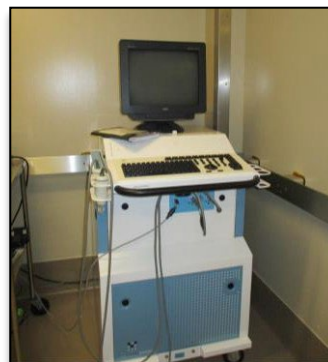
Imaging suite:

- Perkin Elmer IVIS Lumina III in vivo imaging system
- MicroCT scanner (R-mCT2)
- Visual Sonics VEVO 770-120 ultrasound imaging system

Additional equipment:

- Phoenix Micron IV retinal imaging system with OCT
- Rodent EKG System
- RotaRod Performance Test System
- (2) BioSpherix ProOx 110 oxygen-controlled hypoxia chambers
- Cryopreservation services for rodents

Transgenic Mouse Center for generation of mutant mice



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Chemical Genomics Core

The LIMR Chemical Genomics Center (LCGC) provides specialized research services and resources to drug discovery scientists. Our mission is to accelerate translational research in cell signaling and new medicine discovery. We provide access to a large chemical library of over 250,000 small molecules suitable for high throughput screening (HTS) campaigns to discover new drug leads for the most challenging medical indications, including drug-resistant infections, metastatic cancer, and orphan diseases.

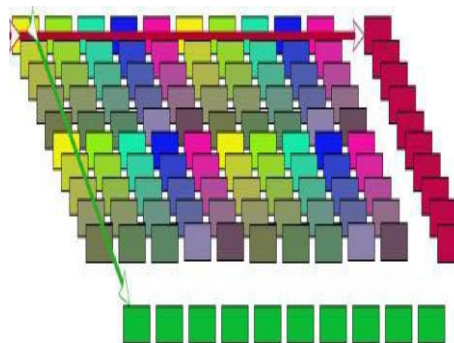
The LCGC compound repositories include the following sets:

- Our **FMC Collection** is comprised of 104,000, diverse drug-filtered compounds. The collection was the proprietary R&D asset of FMC Corp., comprised of rare small-molecule structures that are not available commercially.
- **ChemBridge**: 100,000 compounds. These were assembled from the 50,000 member DIVERSet™-EXP library, plus the 50,000 compound DIVERSet™-CL library.
- **Life Chemicals Inc.**: 50,000 compounds selected to complement the diversity in the LCGC plus ChemBridge collections.
- **MicroSource Pharmakon-1760** combines the 1,360 drugs in its U.S. Drug Collection with the 400 drugs from the International Drug Collection.
- **MicroSource Spectrum Drug Collection** includes about 1,000 bioactive compounds and natural product analogs.
- **NCI-Approved Oncology Drugs Set** contains 166 of the most current FDA-approved anticancer drugs.
- **Nutraceuticals**: About 150 individual neat powders acquired from Sigma, Cayman and other vendors.
- **Misc.**: About 8,000 compounds acquired from other commercial vendors, mainly ChemDiv and TimTec.

Orthogonal-Pooled Screening (OPS) Sets

All of our compounds are available as assay-ready drug screening plates in the OPS format, which guarantees 500% more efficient drug screening. We are the world's leader in this powerful approach that can detect hidden mechanism of synergistic drug action, including triple-drug combinations for infectious diseases and oncology indication.

(U.S. Patent application US20130231264A1)

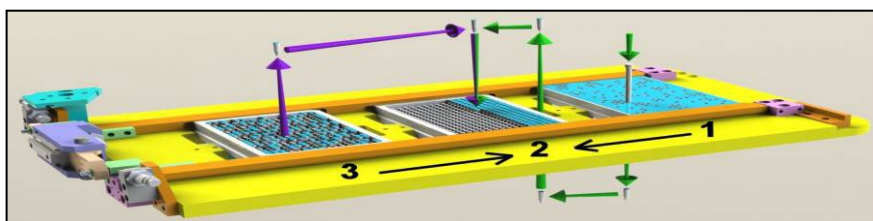
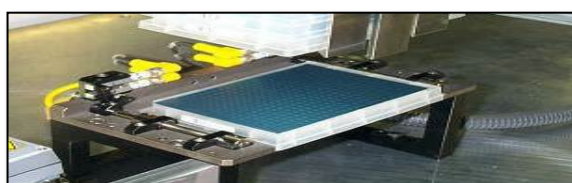


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Chemical Genomics Core (*cont'd*)

Automated Compound Repository

LCGC's compound stock solutions are maintained frozen in a Nanotube Automated Retrieval System, a patented (US20100161119), state-of-the-art, low-temperature, robotic repository system. The system's no freeze-thaw cycling capability preserves the compounds' quality indefinitely. This unique and powerful repository system allows us to offer scientists custom drug screening sets 'on the fly,' in order to build structure-activity relationship models far more rapidly and cost-effectively than any other approach.



HTS Assay Development and Validation

Our chemical resources and lab automation infrastructure provide scientists with unparalleled speed and power to validate and execute successful new drug discovery campaigns at extremely affordable costs.

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Histology Core

Equipment Available

- Microm HM505E cryostat
- Tissue-Tek TEC embedding unit
- Tissue-Tek VIP tissue processor and a Reichert-Jung microtome

The histology core can prepare and section frozen and paraffin-embedded tissues and assist with consultation on novel histological techniques.

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Human Antibody Technology

Monoclonal antibodies now comprise a major group of medicines, encompassing a multibillion-dollar market with diverse uses in research, diagnosis, prognosis and therapy. At present, such antibodies are generated from rodents and must be “humanized” for therapeutic use. Pure human antibodies are expected to offer many clinical benefits, but methods to generate them have been elusive.

LIMR’s **Center for Human Antibody Technology (CHAT)** is a core facility that uses a powerful human antibody cloning platform technology developed by Scott Dessain, MD, PhD. CHAT uses this platform along with a state-of-the-art, high throughput antibody production and screening facility to produce human antibodies for use in the treatment of infectious disease, cancer and neurological illnesses. CHAT is available as a regional resource to provide academic investigators the opportunity to create their own human antibody therapeutics.



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Clinical Trials Core

Planning to advance your research to clinic trials? LIMR has a robust clinical trials infrastructure in a hospital setting with full staffing support.

LIMR provides clinical investigation services, as well as contract and financial management, to healthcare professionals, industry, and biotechnology companies. The Institute employs a staff of over 25 clinical trial professionals, including administrators, managers, clinical research nurses, regulatory specialists, coordinators and assistants. They administer investigator-initiated and sponsored clinical studies.



Overall, the unique hospital/clinical research center model, and integration of the expertise of both clinicians and investigators, can help advance your research initiatives to the clinic.

Services Available

If you are considering initiating clinical research, the LIMR staff may be able assist you with the following services:

- feasibility review
- funding and budget review
- statistical design
- communications with the sponsor
- guidance for regulatory/IRB submission
- assistance with informed consent forms preparation
- organization of initial site visits and ongoing audit visits
- data management guidance
- research coordinators
- marketing and promotion
- contract review
- accounts payable
- post-study financial record maintenance and reconciliation

Other services may be available. Please inquire to learn more.

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Research Services Office

Services Available

LIMR provides administrative support and services that include, but are not limited to:

- preparation and submission of funding applications to federal, state and private organizations
- notary services
- chemical and radiation safety
- copyediting and submission of publications (e.g., abstracts, manuscripts, book chapters)
- scientific poster design, modification and printing

The office works collaboratively with the Director of Research Administration in performing various functions associated with:

- IACUC
- biosafety
- scientific integrity oversight
- funding submissions
- policy and procedure management
- co-op program student management
- other scientific support functions

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Optional Services

- Periodic use of office space
- Receiving services-including dedicated mailboxes, forwarding, and standard/temperature sensitive package delivery
- Use of general laboratory space
- Use of conference room space
- Hosting services for scientific meetings & events

Clinical Reference Laboratory

Investigators, including those based in the Center for Human Antibody Technology and the Chemical Genomics Center, collaborate with the Clinical Research Center to conduct transitional research projects



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