UNIVERSITY OF MIAMI

Research Resources Expo

An Exhibition of the Core Facilities and
Shared Research Resources Across the University

Program and Poster Abstracts

March 18, 2025

UNIVERSITY OF MIAMI

Research Resources Expo

An Exhibition of the Core Facilities and Shared Research Resources Across the University

Tuesday, March 18, 2025

Seminar on

Core Facility Resources at the University of Miami: Catalysts for Advancing Research

12:00 pm - 1:00 pm

Bascom Palmer Auditorium
900 NW 17th St, Miami, FL

Poster Session

1:30 pm - 3:30 pm

Schoninger Research Quadrangle
1035 NW 15th St., Miami, Florida

Tours of Cores

4:00 pm - 5:00 pm

Please register in advance at
https://miami.zoom.us/webinar/register/WN_pUnPQyECS329APCEbS1pjQ

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CTSI MIAMI CLINICAL & TRANSLATIONAL SCIENCE INSTITUTE

WITH ADDITIONAL SUPPORT FROM

College of Engineering
Frost Institute for Chemistry and Molecular Science
Rosenstiel School of Marine, Atmospheric, and Earth Science

ORGANIZED BY

University of Miami Research Cores and Facilities Committee

UNIVERSITY OF MIAMI

Research Resources Expo

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Shared Research Resources Across the University

Seminar on

Core Facility Resources at the University of Miami: Catalysts for Advancing Research

Maria Alcaide, M.D.
Vice Provost for Research and Scholarship
Professor of Medicine, Division of Infectious Diseases
University of Miami

Michal Toborek, M.D., Ph.D.
Associate Dean for Basic Science
Professor & Vice-Chair for Research, Dept. of Biochemistry & Molecular Biology
University of Miami Miller School of Medicine

Fabrice Manns, Ph.D.
Professor and Chair of Biomedical Engineering, College of Engineering
Professor of Ophthalmology, University of Miami Miller School of Medicine

Brian Haus, Ph.D.
Associate Dean for Infrastructure
Professor of Ocean Sciences
Rosenstiel School of Marine, Atmospheric, and Earth Sciences

Tuesday, March 18, 2025
12:00 pm - 1:00 pm

Bascom Palmer Auditorium
University of Miami Miller School of Medicine

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Research Resources Expo

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Poster Session

Tuesday, March 18, 2025
1:30-3:30 pm

Schoniger Research Quadrangle
University of Miami Miller School of Medicine

Five $1,000 lottery prizes for use of cores
will be awarded to poster session attendees!

- Sylvester Flow Cytometry Shared Resource
- Sylvester Onco-Genomics Shared Resource
- Sylvester Biostatistics and Bioinformatics Shared Resource
- Sylvester Behavioral and Community-Based Research Shared Resource
- Sylvester Biospecimen Shared Resource
- Sylvester Cancer Modeling Shared Resource
- Sylvester Data Portal
- HIHG Sequencing Core
- HIHG Genotyping Core
- HIHG Biorepository Core
- HIHG Statistics and Bioinformatics Core
- HIHG iPSC Core Facility
- Miami Project Drug Discovery Core
- Miami Project Transmission Electron Microscopy Core
- Miami Project Imaging Core
- DRI Flow Cytometry Core
- DRI Analytical Imaging Core Facility
- DRI Biomarker and Immunoassay Core
- DRI Animal Core
- DRI cGMP Cell Processing Facility
- Miami Center for AIDS Research (CFAR)
- CFAR Laboratory Sciences Core
- Center for HIV and Research in Mental Health (CHARM)
- PHS Biostatistics Collaboration & Consulting Core
- CTSI Research Navigation Services
- CTSI Research Recruitment Resources
- CTSI UHealth IT Data Science & Research Informatics
- MRI Neuroimaging Facility
- ISCI Clinical Research Cellular Manufacturing Program
- ICRT Imaging Core for Research and Training
- Comparative Pathology Laboratory
- Laboratory for Clinical Bioscience
- Clinical Translational Research Site (CTSR)
- BPEI Ophthalmology Mass Spectrometry Core Facility
- BioNIUM Nanofabrication Facility
- Zebrafish Core Facility
- Division of Veterinary Resources
- Frost Institute for Data Science & Computing (IDSC)
- Frost Institute Electron Microscopy and Mass Spec Cores
- College of Engineering Shared Facilities
- Chemistry Department Shared Research Resources
- Center for Marine Biomedicine
- SUSTAIN- Surge-Structure-Atmosphere-Interaction Lab
- The National Aplysia Resource
- Rosenstiel Stable Isotope Laboratory
- Radiation Control Center
- Office of Research Administration
- Office of Foundation Relations
- University of Miami Libraries
- U Innovation

Pizza will be provided at the poster session

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Shared Research Resources Across the University

Tours of Cores

Tuesday, March 18, 2025
4:00-5:00 pm

University of Miami Miller School of Medicine

- The cores listed below are offering tours. To join a tour, please sign up in advance.
- To sign up for a tour of a core, please contact the core as listed below.
- At the end of the poster session at 3:30 pm, please gather at the poster of the core; a member of the core will walk the tour group to the core.
- Many of these tours have a limit of 20 individuals, so please sign up soon.

Poster No:	Medical School Campus	Contact Person for Tour of Core
14	Sylvester Onco-Genomics Shared Resource	Benjamin Currall (bbc16@med.miami.edu)
12	Sylvester Flow Cytometry Shared Resource	Shannon Saigh (sjsaigh@med.miami.edu)
15	Sylvester Cancer Modeling Shared Resource	Gloria Mas Martin (gxm578@med.miami.edu)
47	Miami Project Drug Discovery Core	Hassan Ali (halali@med.miami.edu)
46	Miami Project Transmission Electron Microscopy Core	Vania Almeida (valmeida@miami.edu)
45	Miami Project Imaging Core	Yan Shi (yshi@miami.edu)
40	DRI Analytical Imaging Core Facility	Maria Boulina (mboulina@miami.edu)
38	DRI cGMP Cell Processing Facility	Xiumin Xu (x.xu@med.miami.edu)
26	HIHG Biorepository Core	Patrice Whitehead (pwhitehead@med.miami.edu)
48	ICRT Imaging Core for Research and Training	Ana Rojas (arojas@med.miami.edu)
35	Clinical Translational Research Site (CTRS)	Carlos Sandoval (c.sandoval1@med.miami.edu)
34	Laboratory for Clinical Bioscience	Ranjini Valiathan (rvaliathan@med.miami.edu)
32	Comparative Pathology Laboratory	Carolyn Cray (ccray@miami.edu)
33	CFAR Laboratory Sciences Core	Margaret Roach (mroach@med.miami.edu)
53	BPEI Ophthalmology Mass Spectrometry Core	Isabella Moceri (ccray@miami.edu)
36	BioNIUM Nanofabrication Facility	Bahar Motlagh (igm243@miami.edu)

UNIVERSITY OF MIAMI

Research Resources Expo

Location of Expo Events on MSOM Campus

Expo Seminar
Bascom Palmer Eye Institute

Expo Poster Session
Schoninger Research Quadrangle

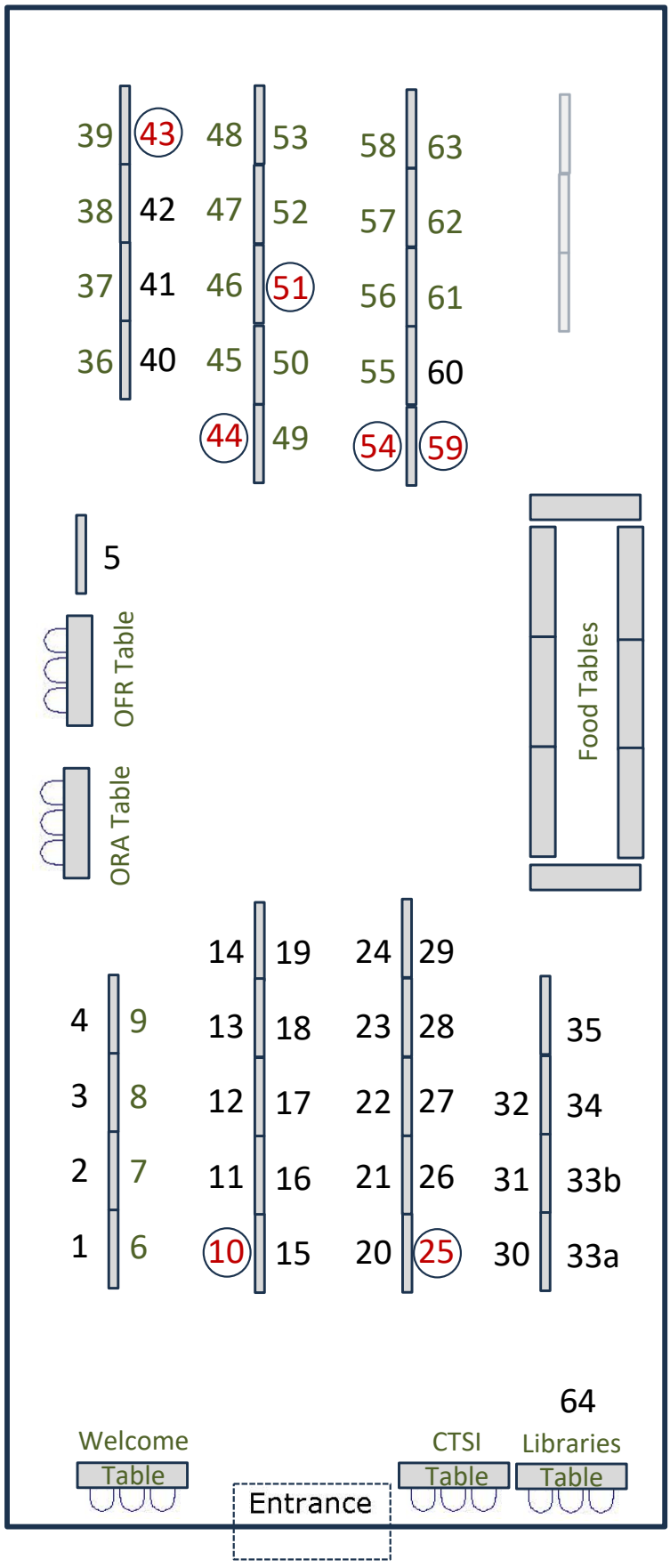
University of Miami (UM) Miller School of Medicine (MSOM) full campus map available at https://welcome.miami.edu/about-um/campuses/miller-school-map

UM Research Resources Expo – Poster Numbers

Poster No.	Poster Title
1	Shared Resources Committees at the University of Miami
2	Facilities and Equipment Committee
3	U Innovation
4	Office of Research Administration
5	Office of Foundation Relations
6	CTSI: Overview of the Miami Clinical and Translational Science Institute
7	CTSI Research Navigation Services
8	CTSI Research Recruitment Resources
9	CTSI UHealth IT Data Science & Research Informatics
10	Virtual Tour of the Sylvester Shared Resources
11	Sylvester Shared Resources
12	Sylvester Flow Cytometry Shared Resource (FCSR)
13	Sylvester Shared Resources Integrated Support for Spatial Multiomics Research
14	Sylvester Onco-Genomics Shared Resource (OGSR)
15	Sylvester Cancer Modeling Shared Resource (CMSR): Overview
16	Sylvester Cancer Modeling Shared Resource (CMSR): Mouse Modeling & Functional Genomics Services
17	Sylvester Cancer Modeling Shared Resource (CMSR): In Vivo Noninvasive Imaging Services
18	Sylvester Cancer Modeling Shared Resource (CMSR): Research Histopathology Services
19	Sylvester Biostatistics and Bioinformatics Shared Resource (BBSR)
20	Sylvester Biospecimen Shared Resource (BSSR)
21	Sylvester Behavioral and Community-Based Research Shared Resource (BCSR)
22	Sylvester Resources Collaborative Support for Cancer-Relevant Clinical Research Studies
23	Sylvester Data Portal (SDP)
24	PHS Biostatistics Collaboration & Consulting Core (BCCC)
25	Virtual Tour of the HIHG Biorepository Core
26	HIHG Biorepository Core
27	HIHG Sequencing Core
28	HIHG Genotyping Core
29	HIHG Statistics and Bioinformatics Core
30	HIHG iPSC Core Facility
31	Pathology Customer Care for Research (PCCR)
32	Comparative Pathology Laboratory
33a	Miami Center for AIDS Research (CFAR)
33b	CFAR Laboratory Sciences Core
34	Laboratory for Clinical Bioscience
35	Clinical Translational Research Site (CTRS)
36	BioNIUM Nanofabrication Facility
37	ISCI Clinical Research Cellular Manufacturing Program
38	DRI cGMP Cell Processing Facility
39	DRI Animal Core
40	DRI Analytical Imaging Core Facility
41	DRI Flow Cytometry Core
42	DRI Biomarker and Immunoassay Core
43	Center for HIV and Research in Mental Health (CHARM)
44	Gallery of Images from Imaging Cores Across the University of Miami
45	Miami Project Imaging Core
46	Miami Project Drug Discovery Core
47	Miami Project Transmission Electron Microscopy Core
48	ICRT - VBI - Imaging Core for Research and Training - Vascular Biology Institute
49	Frost Institute: Electron Microscopy, Mass Spectrometry, and Protein Chemistry
50	Chemistry Department Shared Research Resources - NMR and Mass Spec
51	College of Engineering Shared Services
52	MRI Neuroimaging Facility
53	BPEI Ophthalmology Mass Spectrometry Core Facility
54	Virtual Tour of SUSTAIN
55	SUSTAIN (Surge-Structure-Atmosphere-Interaction Laboratory)
56	Center for Marine Biomedicine
57	The National Aplysia Resource
58	Stable Isotope Laboratory
59	Virtual Tour of the Zebrafish Core Facility
60	Zebrafish Core Facility
61	Division of Veterinary Resources
62	Radiation Control Center
63	Frost Institute for Data Science & Computing (IDSC)
64	University of Miami Libraries

Red font = electronic poster

UM Research Resources Expo 2025
Poster Map



Red font = electronic poster

Shared Resources Committees Activities at the University of Miami

G. Grills[1], L. Kozma[2], L. Bianchi[3], University of Miami Research Cores and Facilities Committee[4], University of Miami Miller School of Medicine Shared Resources Committee[5]

[1]Sylvester Comprehensive Cancer Center; University of Miami Miller School of Medicine, Miami, FL, USA; [2]Office of Research Administration; University of Miami, Coral Gables, FL, USA; [3]Department of Physiology; University of Miami Miller School of Medicine, Miami, FL, USA; [4]Office of the Vice Provost for Research and Scholarship; University of Miami, Coral Gables, FL, USA; [5]Office of the Executive Dean of Research, University of Miami Miller School of Medicine, Miami, FL, USA;

Core facilities and shared resources provide critical support for research. The University of Miami (UM) Research Cores and Facilities Committee (RCFC) and the UM Miller School of Medicine (MSOM) Shared Resources Committee (SRC) work collaboratively to evaluate, support, and enhance the core facilities and shared research resources at the institution. Focus areas include tracking return on investment in cores; facilitating education and marketing about cores; enhancing recruitment, retention, and professional development of core leaders and staff; and promoting networking between cores to leverage synergies and enhance impact. Current committee activities include surveys on what we have and what we need to meet investigators needs; expanding access to tools that facilitate core facility services and operations; and establishing and promoting a UM-wide institutional membership with the Association of Biomolecular Resource Facilities (ABRF) to enable core leaders and staff at UM to more readily access the resources of this national and international professional organization of core facilities. Furthermore, the RCFC organized the UM Research Resources Expo 2025, which included presentations from core facilities and shared research resources from across the University; including an internal networking meeting of core leaders; a public seminar with talks by leaders from all the UM campuses; a poster session; and tours of cores.

Advancing Research Excellence Through Strategic Equipment Management, Infrastructure Optimization, and Interdisciplinary Collaboration

K. Hirani[1], J. Barredo[1], G. Grills[1], J. Hare[1], M. Ivan[1], I. Lossos[1], J. McCauley[1], A. Mendez[1], S. Roy[1], W. Scott[1], S. Boulazreg[2], M, Rahul[1], D. Cardenal[2], L. Roque[2], M. Majzoub[2], A. Paolino[2], P. Wahl[3], M. A. Garza[2]

[1]Miller School of Medicine, University of Miami, Miami, FL, USA; [2]Office of Research Administration, Miller School of Medicine, University of Miami, Miami, FL, USA; [3]Office of the Executive Dean for Research, Miller School of Medicine, University of Miami, Miami, FL, USA

The Facilities and Equipment Committee (FEC) at the University of Miami (UM) Miller School of Medicine (MSOM) is dedicated to fostering interdisciplinary team science through strategic oversight of research infrastructure and shared equipment resources. The committee's mission is to optimize the utilization of research equipment, improve accountability, and eliminate traditional research silos through innovative solutions designed to serve faculty, staff, and students. FEC functions as a collaborative forum where subject matter experts from diverse disciplines review topics and challenges brought forward by the research community. The committee evaluates proposals, feedback, and operational needs (often gathered through surveys and direct communications) and formulates informed recommendations for institutional leadership to support continuous improvement in research operations. Through comprehensive gap analyses and ongoing process review, the FEC has identified key priorities, including implementing a centralized equipment tracking system, consolidating maintenance contracts for cost efficiency, standardizing freezer management protocols, and developing robust contingency plans to safeguard research assets during emergencies. After careful evaluation of systems such as Asset Panda, MachineQ, and EZ Inventory, the committee is facilitating the development of a live, searchable database to improve equipment visibility and campus-wide accessibility. These strategies aim to advance collaborative research, reduce redundancy, and enhance operational transparency and efficiency. Additionally, FEC prioritizes disaster preparedness, with special attention to hurricane response protocols, sample safeguarding, emergency transport logistics, and power backup solutions. The committee actively reviews and refines best practices, such as the Freezer Compliance Checklist, to strengthen compliance, safety, and resource sustainability. Through these ongoing efforts, the FEC promotes improved resource sharing, enhanced safety standards, and cost-effective management of critical research infrastructure. By aligning with MSOM's strategic vision, the committee supports a culture of teamwork and operational excellence, contributing to the recruitment of top-tier researchers and reinforcing the institution's position at the forefront of biomedical discovery.

U Innovation

W.R. Silverman[1], W. Hough[2], S. Markova[2], S. Palmer Shields[3]

[1] Office of Technology Transfer, University of Miami, Miami FL USA; [2] 'Cane Angel Network, University of Miami, Miami FL USA; [3] The Launch Pad, University of Miami, Miami FL USA; [4] Coulter Center for Translational Research, University of Miami, Miami FL USA.

U Innovation assists faculty, clinicians, staff, and students in translating discoveries from academia to the marketplace. Composed of four units, Office for Technology Transfer, Coulter Center for Translational Research, The Launch Pad, and 'Cane Angel Network, U Innovation provides guidance, mentorship, and resources to bridge the gap from idea to reality.

Website: https://innovation.miami.edu

University of Miami Office of Research Administration (ORA)

L. Kozma[1], B. Strickland[1], L. Vera[1], Y. Wu[1]

[1]University of Miami, Miami, FL, USA

This poster will provide information on all the role, responsibilities, and resources of the University of Miami (UM) Office of Research Administration (ORA), including proposal review, processing, contract negotiations, award funding, and expenditure and compliance monitoring. The poster will provide key contacts and best practices, with a focus on the review and approval of rates for service centers.

Office of Corporate and Foundation Relations

M. Peerless[1], S. Karas[1], L. Siegel[1]

[1]Office of Corporate and Foundation Relations, University of Miami, Miami, FL, USA

The Office of Corporate and Foundation Relations supports fundraising from private independent foundations. The team works proactively to identify funding opportunities aligned with institutional priorities and areas of strength, in an effort to expand funding for faculty, physician scientists, and researchers at the University of Miami from national foundations and corporate foundations. Part of the University's Division of Development and Alumni Relations, this centrally based team works across all three campuses. The team builds and maintains relationships with foundations, to present donors with a coordinated institution-wide approach and to promote research expertise, often generating opportunities to apply for invitation-only grants.

The Office of Corporate and Foundation Relations disseminates grant opportunities: directly to specific PIs, with guidance from institutional, school/college-level, and department/division leadership, and through the Office of the Vice Provost for Research and Scholarship's weekly newsletter (*Funding Rundown*, sent out on Wednesdays). Once a PI identifies a compatible grant opportunity, the foundation relations team assists with the application process by:

- Analyzing/summarizing proposal requirements
- Providing institutional information and documentation
- Reviewing and editing proposal drafts
- Collaborating with the PI and school-/department-level sponsored program teams on budget development and internal submission processes (Office of Research Administration)
- Offering historical information/context on the funder
- Liaising with the foundation as needed before, during, and after application process

The team can support stewardship activities, including narrative/project reporting and site visits, for awarded grants.

The Corporate and Foundation Relations team has developed a robust database of grant opportunities, all of which have been vetted for eligibility for the University of Miami. The database is searchable by funder/program, career level, deadline, and other criteria; and all opportunities are tagged by subject. Grants to support research, training, programming, and career development are included. The database is accessible at: https://tinyurl.com/UMCFRdatabase.

Miami Clinical and Translational Science Institute

R. Perez[1], D. Ransford[1], S. Dominguez[1], E. Kobetz[1,2,3], O. Carrasquillo[1,3]

[1]Miami Clinical and Translational Science Institute; [2]Office of the Chief Health Equity Officer/Vice President for Health Equity; [3]University of Miami Miller School of Medicine, Miami, FL, USA

The University of Miami Clinical and Translational Science Institute (Miami CTSI) catalyzes the development, demonstration, and dissemination of scientific discoveries to improve the health of our community and address health outcomes across populations. The Miami CTSI improves the efficiency, effectiveness, and quality of clinical and translational research through the bidirectional engagement of a broad range of stakeholders, including patients, community partners, and others to help identify gaps, challenges and bottlenecks in the translational research process. In response, the Miami CTSI develops tools, processes and resources, implementing and disseminating demonstrably successful interventions. Miami CTSI aims include:

1. Develop, demonstrate, and disseminate innovative resources and services that will increase the quality, efficiency, and effectiveness of research across the entire translational research spectrum.

2. Promote partnerships and collaborations aimed at facilitating and accelerating research to improve community health and address health outcomes across populations.

3. Create and provide education, training, career development, and mentoring opportunities to support CTS and team science in a highly diverse and skilled workforce of multidisciplinary translational scientists and research professionals.

4. Support promising, early-stage investigator-led CTS pilot research studies, prioritizing stakeholder-engaged projects responsive to our overarching goals of community health and addressing health outcomes across population groups that comprise South Florida.

5. Conduct a research project that will develop, test, and evaluate the effectiveness of various approaches to increase opportunities for patients and community members to participate in biomedical research.

6. Sustain a robust leadership team of highly experienced investigators and research professionals to manage a dynamic CTSI program, ensuring the successful execution of the Hub's proposed goals, demonstrating impact with effective evaluative processes, and broadly disseminating our solutions to the CTSA network.

The Miami CTSI is funded by grant number UM1TR004556 from the National Center for Advancing Translational Sciences (NCATS) of the National Institutes of Health (NIH).

Miami Clinical and Translational Science Institute: Research Navigation Services

P. Atkinson, M. Couch, S. Dominguez

Miami Clinical and Translational Science Institute, University of Miami Miller School of Medicine, Miami, FL, USA

The Miami Clinical and Translational Science Institute (CTSI) provides crucial support and resources to the University of Miami's investigators as they plan and implement research studies and clinical trials that aim to improve the health of patients in our diverse communities and beyond. The CTSI provides two specific resources designed to help the University community successfully navigate the research environment at the institution.

The *Research Compass* is a dynamic online resource designed to guide researchers to crucial and timely information needed to facilitate research. It is organized around the stages of the research project lifecycle and offers resources for initiating your research program, finding collaborators and funding, developing proposals, implementing a research project, disseminating findings, engaging with communities, and more. The Compass includes Grant Standard Form Language (Grant Boilerplates), Tip Sheets, and Getting Started Guides. It is available to all faculty, staff, and students involved in the research enterprise.

The *Research Navigator* is a centralized one-to-one, concierge-style support service designed to connect researchers to the right resources when needed. The Navigator offers support designed to assist researchers personally in navigating research at the University by providing assistance with finding funding and collaborators and other resources, as well as guidance on proposal development, compliance, policies, systems, contracts, purchasing, and other research areas.

The Miami CTSI is funded by grant number UM1TR004556 from the National Center for Advancing Translational Sciences (NCATS) of the National Institutes of Health (NIH).

Miami CTSI Research Recruitment Resources: Facilitate Participant Recruitment into Research Studies

C.C. Lee[1], D. Ransford[1], C. Canales[1], A. Barreto[1,2], I. Ramsingh[3], D. Maciel[2], and C.I. Schulman[1,4]

[1]Miami Clinical and Translational Science Institute, University of Miami Miller School of Medicine, Miami, FL, USA; [2]UHealth Information Technology, University of Miami Health System (UHealth), Miami, FL, USA; [3]Data Broker Research Privacy, University of Miami, Miami, FL, USA; [4]University of Miami Miller School of Medicine, Miami, FL, USA

Participant recruitment is critical to the success of all research studies. In an effort to advance clinical and translational science and help research study teams recruit volunteers for research studies, the Miami CTSI Research Resources program has three recruitment tools: 1) *Consent to Contact (CTC)*, an opt-in research registry where University of Miami Health System (UHealth) patients are asked for permission to be contacted about studies matching their demographic and/or health profiles; 2) *MyChart Research Recruitment*, allows research study teams to use MyUHealthChart messaging to contact UHealth patients who opted-in the CTC registry and have an active MyUHealthChart account; and 2) *UMiamiHealthResearch.org (UMHR)*, implemented with the Michigan CTSA, a community-based registry for volunteers to sign up and be contacted about studies. Research study teams can use these tools once they have obtained IRB approval for their research.

The Miami CTSI is funded by grant number UM1TR004556 from the National Center for Advancing Translational Sciences (NCATS) of the National Institutes of Health (NIH).

UHealth Data Science and Research Informatics / CTSI Informatics

P. Taghioff, W. Wu, T. Yuen

[1]UHealth Information Technology / Miami Clinical and Translational Science Institute (CTSI) Informatics, University of Miami Miller School of Medicine, FL, USA

The Miami Clinical and Translational Science Institute (CTSI) Health Informatics program is a collaborative effort between the University of Miami Health System Information Technology Department and the CTSI and provides translational informatics support to the UM research enterprise. The services offered by Health Informatics address well known barriers in clinical research, including services such as providing clinical data from UChart for IRB approved research studies, informatics consultations to help assess the feasibility of research studies using real-world data, workshops designed to build the foundational expertise of researchers on informatics tools such as Epic SlicerDicer and for preparatory-to-research activities, and management of secure computing workbenches for researchers working with data that requires strict controls around access and export. Health Informatics is also responsible for maintaining the UM research data warehouse, comprised of clinical data from UChart, and increasing the richness of the data through various processes (e.g., geocoding, linking to open-source neighborhood level data).

The Miami CTSI is funded by grant number UM1TR004556 from the National Center for Advancing Translational Sciences (NCATS) of the National Institutes of Health (NIH).

Virtual Tour of the Sylvester Shared Resources

G. Grills[1], E. Wieder[1,2]

[1]Sylvester Comprehensive Cancer Center; [2]Department of Medicine; University of Miami Miller School of Medicine, Miami, FL, USA

Come join a virtual tour of the Sylvester Comprehensive Cancer Center (SCCC) Shared Resources. The Sylvester Shared Resources catalyze and promote cancer research by providing high-level expertise, advanced methodologies, state-of-the-art technologies, and a comprehensive array of services for Sylvester researchers and outside investigators. The Sylvester Shared Resources offer coordinated support for transdisciplinary and translational oncology research with resources and services for Onco-Genomics (OGSR), Flow Cytometry (FCSR), Biostatistics and Bioinformatics (BBSR), Cancer Modeling (CMSR), Biospecimen (BSSR), and Behavioral and Community-Based Research (BCSR). A Cancer Proteomics Shared Resource (PSR) is being established. The Shared Resources provide coordinated crucial services that facilitate and advance impactful cancer research.

Contact:
George Grills, Associate Director, Shared Resources
Website: https://sylvester.org/sharedresources

Sylvester Shared Resources

G. Grills[1], S. Williams[1,2], B. Currall[1], O. Carrasquillo[1,3,4], N. Schaefer Solle[1,3,4], D. Bilbao[1,5], G. Mas Martin[1], N. Merchant[1,6], M. Boone[1], Y. Guo[1,4], M. Ceccarelli[1,4], T. Diefenbach[1], T. George[1], E. Wieder[1,3]

[1]Sylvester Comprehensive Cancer Center; [2]Department of Neurology; [3]Department of Medicine; [4]Department of Public Health Sciences; [5]Department of Pathology & Laboratory Medicine; [6]Department of Surgery, University of Miami Miller School of Medicine, Miami, FL, USA

The Sylvester Comprehensive Cancer Center (SCCC) Shared Resources (SRs) catalyze and promote cancer research by providing high-level expertise, advanced technologies, and a comprehensive array of services for Sylvester researchers and outside investigators. The SRs offer coordinated support for transdisciplinary and translational oncology research with resources and services for Onco-Genomics (OGSR), Flow Cytometry (FCSR), Biostatistics and Bioinformatics (BBSR), Cancer Modeling (CMSR), Biospecimen (BSSR), and Behavioral and Community-Based Research (BCSR). A Cancer Proteomics Shared Resource (PSR) is currently being established. The OGSR provides next-generation sequencing, single-cell and spatial genomics, gene expression and molecular quantification, and sample processing. The FCSR provides high-parameter fluorescence-activated cell sorting, standard and spectral analytical flow cytometry, mass cytometry and imaging mass cytometry, and confocal microscopy. The BBSR provides biostatistics and bioinformatics support for basic and translational research, clinical trials, and population-based studies, including support for data analysis and interpretation, software access, and algorithm and database development. The BCSR provides services for behavioral, community, and population-based research that aligns with Sylvester's catchment area needs, including recruitment and retention of research subjects; development of culturally and linguistically tailored study materials; data collection and management in clinical and community settings; and development and delivery of evidence-based interventions. The BSSR supports clinical and translational cancer research with a growing biobank of diverse tissue types and services for biospecimen collection, annotation, processing, storage, and distribution, as well as support for non-interventional trials that involve biospecimen collection, including study recruitment and retention. The CMSR provides integrated small animal cancer modeling services that facilitate generation of preclinical data for drug development and support proof of principle efforts to evaluate novel therapies; services include support for the development of mouse models of human cancer, including functional genomics services for establishing novel models; development and application of treatment protocols in a pre-clinical setting; and diagnosis and evaluation of responses to treatment, including noninvasive in vivo imaging and histopathology analysis. An online service request and instrument reservation portal (Agilent iLab) provides ready access to all SR resources and services. The SRs facilitate research rigor and reproducibility by developing and applying best practices, including standard operating procedures, quality assessment and quality controls, and robust data management. Moreover, the SRs provide multidisciplinary support for research projects, offering coordinated services for project design, data generation, and data analysis. The SRs also offer consultation, training, seminars, and workshops. Centralized SR management facilitates implementation of emerging technologies and innovative services and ensures efficient SR operations and effective evaluation and integration. The Shared Resources provide services that enable high-impact publications and grant awards and catalyze impactful cancer research.

Contact:
George Grills, Associate Director, Shared Resources
Website: https://sylvester.org/sharedresources

Sylvester Flow Cytometry Shared Resource

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The Sylvester Comprehensive Cancer Center (SCCC) Flow Cytometry Shared Resource (FCSR) offers expertise, resources and services for state-of-the-art fluorescence-activated cell sorting (FACS), conventional and spectral analytical flow cytometry, mass cytometry and imaging mass cytometry, and confocal microscopy. The FCSR's resources and services are critical to the success of a wide range of cancer research projects, including immunophenotyping, cell cycle analysis, cell signaling, proliferation and apoptosis, interaction between cancer cells and the tumor microenvironment (TME), and biomarkers for detection and diagnosis of cancer. The facility has four cell analyzers, three cell sorters, two mass cytometry platforms, and a confocal microscope. *FACS sorting instruments* include the BD FACSAria Fusion, Cytek Aurora CS (spectral sorter), and a Beckman CytoFLEX SRT (which is available for investigator-operated sorting). *FACS analyzers* include the BD FACSymphony A5 SE, Cytek Aurora, BD LSR Fortessa HTS, and BD FACSCanto-II. The high-parameter cell sorters can sort into bulk tubes or multi-well plates for single-cell cloning under BSL-2 conditions. The FCSR offers spectral cytometric analysis of up to 40 fluorescent parameters for both cell surface and intracellular antigen detection. The FCSR also offers *mass cytometry* and *imaging mass cytometry* services with the Standard BioTools CyTOF Helios and Hyperion platforms, which use cellular targets in suspension or solid tissue sections on slides, labelled with antibodies conjugated to heavy metal isotopes that are detected using time-of-flight mass spectrometry. These CyTOF platforms generate high-resolution phenotypic and functional profiles of cells and tissues from normal and diseased states, with the capability of multiplexing up to 50 markers simultaneously in single-cell suspensions or in tissue sections for spatial analysis of TME. To facilitate CyTOF applications, the FCSR offers a reagent bank, metal antibody-conjugation services, a slide-staining service for customized experimental panels, and access to sophisticated image analysis software (Visiopharm). The FCSR also offers a state-of-the-art laser scanning *confocal microscope*, the Zeiss LSM 980 equipped with AiryScan2. The LSM 980 offers super resolution imaging at 120 nm resolution (90 nm with deconvolution), both fixed and live cell imaging capability with multiple carrier types, transmitted and widefield imaging with standard fluorescence filter sets, multiplexed imaging performance with high sensitivity (low phototoxicity) and high speed, spectral profiling and unmixing capability, and the flexibility to utilize a large selection of fluorescent labels. Additionally, the FCSR offers experimental and panel design consultation, instrument and data analysis training for both cytometry and imaging, and seminars and educational workshops. Working closely with other Sylvester Shared Resources, the FCSR facilitates the development and implementation of multi-Shared Resource integrated workflows and new single-cell and spatial multiomics approaches that enable increasingly complex experimental design. Since 2022, the FCSR has been designated a Center of Excellence by the International Society for the Advancement of Cytometry (ISAC), an award that recognizes outstanding flow cytometry shared resources that follow best practices and demonstrate expertise in achieving performance standards.

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Sylvester Shared Resources Integrated Support for Spatial Multiomics Research

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Spatial multiomics enables the correlation of gene and protein expression data with cells or morphological regions across a tissue section. The Sylvester Comprehensive Cancer Center (SCCC) Shared Resources provide multidisciplinary support through an array of resources and services for spatial multiomics project design, data generation, data analysis and visualization. Integrated services include 1) tissue acquisition, and processing; 2) slide preparation, automated immunostaining, and antibody panel validation; 3) data generation; and 4) data analysis and visualization. Tissue preparation, microarray generation, and histology services are provided by the Biospecimen Shared Resource (BSSR), the Cancer Modeling Shared Resource (CMSR), and the DRI Analytical Imaging Shared Resource (AISR). Of note, the CMSR has a Leica Bond RXm automated staining system to support standardized workflows. Spatial multiomics data generation is provided by the Onco-Genomics Shared Resource (OGSR), Flow Cytometry Shared Resource (FCSR), and AISR. The OGSR provides 10X Genomics Visium data generation supported by CytAssist probe transfer and imaging, combined with Illumina next generation sequencing (NGS). The OGSR also offers digital spatial profiling with a Bruker GeoMx DSP and with a Bruker CosMx SMI that provides single-cell resolution using transcript and protein panels. The FCSR offers spatial multiomics services using a CyTOF Hyperion imaging mass cytometry system that generates 50+ parameter images of sections or tissue microarrays at single cell or subcellular resolution. A repository of validated antibodies for human and mouse markers and a heavy metal-antibody conjugation service are also available. The AISR offers a Leica laser microdissection (LMD) instrument that can isolate regions of interest from tissues at low to single cell resolution. The FCSR provides software tools and training for mass imaging cytometry analysis, Bruker software is accessible through the OGSR, and the AISR offers LMD software tools and training. The Biostatistics and Bioinformatics Shared Resource (BBSR), in close collaboration with the other Shared Resources, offers spatial multiomics project design and data analysis consultation and can support integration of data from different spatial multiomics platforms and from companion single cell studies. This team science approach advances oncology research, particularly research on solid tumor biology, immunology, and microenvironment.

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Sylvester Onco-Genomics Shared Resource

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The Sylvester Comprehensive Cancer Center (SCCC) Onco-Genomics Shared Resource (OGSR) provides expertise and state-of-the-art resources for the study of cancer genomics epigenomics, transcriptomics, and metagenomics. Services include next-generation sequencing (NGS) and library preparation; single-cell and spatial multiomics; non-NGS gene expression assays; and sample extraction, quantification, and quality assessment. The OGSR offers an Illumina NovaSeq X Plus sequencer, which provides uniquely fast and cost-effective NGS. The facility has expanded support for high-resolution spatial multiomics with 10X Genomics Visium applications and the Bruker GeoMx and CosMx platforms. NGS library preparation and sequencing services include total stranded RNA-seq for transcriptomics and non-coding RNA studies; DNA library preparation services for fragmented ChIP DNA, whole genome sequencing (WGS), shotgun metagenomics, and duplex sequencing panels for low frequency mutations. The OGSR also provides library QA/QC and sequencing services for investigator-generated libraries. Single-cell services enable profiling of gene expression, immune repertoire, cell surface markers, chromatin accessibility, and driver mutation profiling for heterogeneity studies. Gene expression assays are available using qPCR, dPCR, or the Bruker nCounter. Working closely with other Shared Resources, the OGSR supports coordinated project design and integrated workflows for projects that span multiple Shared Resources, including sample processing, data generation, and bioinformatic analysis. The facility also offers seminars and workshops on existing and emerging genomics technologies and applications. The OGSR is currently expanding support for WGS of low-input samples and single-cell WGS applications to facilitate studies of cancer heterogeneity; implementing the Bruker CosMx spatial molecular imager for tumor microenvironment and immuno-oncology research; building sample and library preparation services to support the use of new long-read sequencing platforms available on the medical school campus, to enhance genomics and epigenomics research; and contributing to Sylvester-wide efforts to enable effective genomics data management and analysis in support of transdisciplinary cancer research.

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Sylvester Cancer Modeling Shared Resource: Overview

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The Sylvester Comprehensive Cancer Center (SCCC) Cancer Modeling Shared Resource (CMSR) supports the *design and execution of preclinical studies utilizing mouse models of human cancer*. The CMSR provides an integrated array of state-of-the-art services for developing novel mouse models of human cancer and evaluating treatment response, including: 1) development and use of experimental mouse models of human cancer, including *generating human and mouse cancer cell line and human patient-derived xenografts (PDXs), genetically engineered mouse models, and humanized mouse models*; 2) design and implementation of novel *cancer treatment protocols for pre-clinical studies* using cancer models, including optimization of drug formulation and delivery, drug toxicity and efficacy assessments, sample collection and biochemical assays for pharmacokinetics and pharmacodynamics (PK/PD) studies, blood counts and chemistry analysis, and total body and/or image-guided radiotherapy; 3) *diagnosis and evaluation of cancer treatment responses* using a) *noninvasive in vivo small animal imaging*, including *in vivo* bioluminescence and fluorescence optical imaging, high-frequency ultrasound, structural and functional nuclear imaging (PET/SPEC/CT), and small animal magnetic resonance imaging (MRI); and b) *hematology, clinical chemistry, and histopathological analysis*, including tissue processing, embedding, sectioning, tissue microarrays production, H&E staining and immunohistochemistry staining, whole slide scanning, and digital image storage and analysis; and 4) *functional genomics services for mouse modeling using a CRISPR/Cas9 platform* to screen sgRNA libraries and cell line production, and to efficiently generate novel genetic models. The CMSR offers the only small animal MRI, PET, and image-guided irradiation platforms and the only automated immuno-histochemistry instrument and digital research histopathology services at the University of Miami. The facility also offers consultation, training, seminars, and educational workshops. Moreover, the CMSR coordinates with the other Sylvester Shared Resources to provide integrated services, including for support of mouse model characterization and spatial multiomics research.

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Sylvester Cancer Modeling Shared Resource: Modeling and Functional Genomics Services

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The Sylvester Comprehensive Cancer Center (SCCC) Cancer Modeling Shared Resource (CMSR) plays a vital role in advancing preclinical cancer research by offering a comprehensive suite of services that support the development and testing of cancer therapies across a wide array of model systems. At the core of CMSR's services is enabling researchers to create and utilize various experimental models, including human and mouse cancer cell lines, patient-derived xenografts (PDXs), genetically engineered mouse models, and humanized mice. Apart from transplantation-based cancer models, the facility also supports the creation of transgenic mouse models through *in vivo* CRISPR editing of embryos, as well as rederivation and *in vitro* fertilization services. The CMSR supports molecular and cell culture applications, such as creating knock-out (KO) and knock-in (KI) cell lines, sgRNA cloning, and genome-wide screenings, both for *in vitro* and *in vivo* applications. Through these modeling services, researchers can refine drug formulations, evaluate drug toxicity and efficacy, and conduct pharmacokinetic and pharmacodynamic studies. These efforts are further enhanced by advanced, non-invasive imaging technologies that allow for the monitoring of treatment responses and histopathological analysis. The CMSR offers consultation services, training workshops, and educational seminars to help researchers harness the full potential of these technologies. The CMSR's comprehensive suite of resources positions it as a cornerstone in advancing cancer research, providing services from model generation and treatment testing to state-of-the-art imaging and in-depth genomic analysis with yhr coordinated support of other Sylvester Shared Resources. With the CMSR's cutting-edge tools and expertise, researchers at the Sylvester Comprehensive Cancer Center are empowered to explore new avenues in cancer research, pushing the boundaries of discovery and therapy.

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Sylvester Cancer Modeling Shared Resource: *In Vivo* Noninvasive Imaging Services

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The Sylvester Comprehensive Cancer Center (SCCC) Cancer Modeling Shared Resource (CMSR) supports the design and execution of preclinical studies utilizing mouse models of human cancer. CMSR *in vivo* noninvasive imaging services utilize cutting-edge imaging technologies to support scientific research aimed at better understanding human disease and improving diagnostic and therapeutic strategies for clinical translation. The CMSR offers bioluminescent and fluorescent imaging, high-frequency ultrasound imaging, and total body irradiation. Moreover, the CMSR offers the only small animal MRI, PET/SPECT/CT, and image-guided irradiation platforms at the University of Miami. These advanced technologies support an integrated array of high-quality services that are offered by CMSR personnel with extensive experience and expertise. CMSR imaging services support a wide range of research with a broad scope of applications, including 1) bioluminescent and fluorescent imaging (IVIS); 2) tumor volume quantification, echocardiography, cardiac injections (ultrasound); 3) total body and/or image-guided radiation therapy; 4) imaging biological and biochemical characteristics of disease (PET/SPECT/CT); 5) radiochemistry services capable of synthesizing novel radiotracers in therapeutic and diagnostic applications; and 6) imaging functional and structural characteristics of disease models (MRI).
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Sylvester Cancer Modeling Shared Resource: Research Histopathology Services

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The Sylvester Comprehensive Cancer Center (SCCC) Cancer Modeling Shared Resource (CMSR) provides comprehensive histology services to support basic and clinical research at the University of Miami. The CMSR offers a full range of standard histology services, including tissue processing, embedding, sectioning, standard and special staining, immunohistochemistry (IHC), immunofluorescence (IF) and whole-slide imaging. The CMSR also offers specialized services such as tissue microarray (TMA) generation and project-based support for spatial multiomics studies, pathological analysis, and AI-based image analysis. CMSR research histopathology services are coordinated and integrated with the Department of Pathology and Laboratory Medicine (DPLM), including close collaborations with experienced pathologists. The CMSR has built a tumor archive and provides formalin-fixed, paraffin-embedded (FFPE) sample procurement services for investigators to have access to well-curated clinical and academic repositories for their research. The CMSR's integration of advanced digital and molecular pathology techniques with traditional histopathology services provides an essential source of support for translational researchers looking to advance precision medicine and biomarker discovery.

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Sylvester Biostatistics And Bioinformatics Shared Resource

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The Sylvester Comprehensive Cancer Center (SCCC) Biostatistics and Bioinformatics Shared Resource (BBSR) provides state-of-the-art expertise and support in biostatistics, bioinformatics, clinical trial design, and statistical computing that is critical to the success of basic, clinical, translational, and population-based cancer research. The BBSR provides 1) statistical and bioinformatics services for study design, power analysis, sample size estimation, and feasibility assessment for basic, translational, and clinical research; 2) statistical and genomic data analysis services; 3) statistical review of clinical and population science research protocols; and 4) consultation and training. The BBSR offers assistance for biostatistics and bioinformatics needs through all phases of cancer research, from project design to execution, data analysis, interpretation of results, dissemination of findings, and data management and preservation. Biostatistics services include support for statistical design of clinical trials, population studies, and laboratory experiments; sample size determination and justification; statistical analysis plans; statistical support for data and safety monitoring of clinical trials (e.g., review of the statistical adequacy of study design, sample size calculation, and analytical planning); data analysis and interpretation; prediction model development using machine learning techniques; and database design and data management. Bioinformatics services include project design and analysis for high-throughput genomics data (e.g., RNA-seq, single-cell RNA-seq, ChIP-seq, ATAC-seq, microbiome, exome and whole genome sequencing, pathway, drug sensitivity, and advanced visualization), and the development of deep learning (e.g., convolution and graph neural networks) for project-specific analyses, including knowledge generation and predictions. The BBSR also provides education and training on both standard and novel biostatistical and bioinformatics methodologies relevant to data acquisition and analysis. Coordinating closely with the other Sylvester Shared Resources, the BBSR facilitates the development and implementation of analysis approaches that enable increasingly complex experimental design and high impact research results.

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Sylvester Biospecimen Shared Resource

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The Sylvester Comprehensive Cancer Center (SCCC) Biospecimen Shared Resource (BSSR) plays a vital role in advancing cancer-focused research by providing expertise and services for the collection, storage, and distribution of biological specimens. The BSSR has a diverse and growing biorepository of patient samples (e.g., tissue specimens, blood and other biofluids) and maintains an online clinically annotated biorepository database, providing a searchable public catalog of de-identified data that investigators can use to select specimens by tissue type, anatomical site, disease, demographics, and other metadata. The BSSR biorepository is a readily accessible resource for facilitating translational cancer research. The BSSR also provides services focused on facilitating non-interventional trials (NITs) that involve biospecimen collection, including protocol development and regulatory support, data management, participant recruitment and retention, and study-specific biospecimen acquisition, processing, and distribution. BSSR services include (1) screening, consenting, and enrolling patients for biospecimen collection studies; (2) plasma, buffy coat, serum, and peripheral blood mononuclear cell isolation and cryopreservation; (3) rapid acquisition of surgical tissue and fresh biopsies for development of patient-derived xenografts, cell cultures, and organoids; (4) clinical annotation, quality assessment and quality control of biospecimens; and (5) facilitating the retrieval and processing of tissue. The BSSR collects samples in both inpatient and outpatient settings. The facility also offers training, workshops, and seminars on best practices, innovative techniques, and the latest advances in biospecimen collection methodologies. The BSSR works closely with other Sylvester Shared Resources, including the Behavioral and Community-Based Research Shared Resource (BCSR), and with Sylvester's Clinical Research Services (CRS), the University of Miami's Hussman Institute for Human Genomics (HIHG) Biorepository Core, and the University's Department of Pathology and Laboratory Medicine, for coordinated support of biorepository-related oncology research.

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The Sylvester Comprehensive Cancer Center (SCCC) Behavioral and Community-Based Research Shared Resource (BCSR) provides expertise and services that facilitate a wide array of cancer research, including behavioral, psychosocial, clinical, translational, and population studies in both community and clinic-based settings. The leaders of the BCSR are national experts in cancer disparities, community engagement, qualitative and quantitative research methods, and translational science. The BCSR provides services that help maximize participation of populations representative of the catchment area in Sylvester's non-treatment interventional and non-interventional research studies. BCSR services include 1) coordinating the recruitment and retention of study participants representative of Sylvester's South Florida catchment area; 2) supporting the development of culturally and linguistically tailored study materials, including translation of informed consent forms and recruitment materials in Spanish and Haitian Creole; 3) facilitating data and laboratory specimen collection in clinical and community settings; and 4) assisting with the development and delivery of research interventions across the cancer continuum, from prevention to survivorship. The BCSR supports the development of innovative, culturally appropriate approaches to engage, recruit, and retain targeted populations for research studies in community settings, such as prevention studies; provides participant screening for studies recruiting cancer patients; and facilitates ongoing participant engagement towards retention in longitudinal studies. BCSR translation services help ensure that project study materials are appropriately aligned with cultural, linguistic, and other community-based needs and the preferences of a study's target population. BCSR data collection services include quantitative research services, such as survey collection and developing and managing study-specific REDCap databases, and qualitative research services, including conducting focus groups, ethnographies, in-depth key informant interviews, and qualitative data analysis. BCSR services also include laboratory specimen (e.g., blood or saliva) collection for behavioral, community-based, and population studies. Moreover, the BCSR provides support for delivering evidence-based interventions (e.g., conducting cognitive based stress management for studies). Investigators can opt for support of selected activities (e.g., recruitment or translation) or for a full range of support, including study project management, and operationalizing study design, intervention design, implementation, and delivery. The BCSR works collaboratively with other Sylvester Shared Resources, including the Biospecimen Shared Resource (BSSR), and other Sylvester service groups, including Clinical Research Services (CRS) and Community Outreach and Engagement (COE), to support coordinated approaches that engage and maintain community participation in catchment area-relevant research.

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Sylvester Resources Collaborative Support for Cancer-Relevant Clinical Research Studies

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The research resources at the Sylvester Comprehensive Cancer Center (SCCC) drive and enhance cancer-relevant clinical research studies by offering specialized expertise, cutting-edge technologies, advanced methodologies, and a wide range of services to support both Sylvester researchers and external investigators. Four key Sylvester resources — the Biospecimen Shared Resource (BSSR), Behavioral and Community-Based Research Shared Resource (BCSR), Biostatistics and Bioinformatics Shared Resource (BBSR), and Clinical Research Services (CRS) — work in synergy to support the research needs of investigators. This collaboration ensures a streamlined, multidisciplinary approach to cancer research, providing robust infrastructure and expertise to enhance study design, execution, and translational potential. The BSSR plays a pivotal role in the collection, processing, storage, and distribution of high-quality human biospecimens, such as tumor tissue, blood, and other biological materials. The BCSR focuses on integrating behavioral science and community engagement in cancer research, providing services for study design, intervention development, and implementation, particularly in addressing health disparities and enhancing recruitment efforts from the catchment area. The BCSR works to facilitate collaborations between researchers and community stakeholders to ensure culturally competent and community-driven research. The BBSR provides statistical support for clinical trial design and for data and safety monitoring of clinical trials. CRS supports the operational aspects of clinical trials, providing services such as protocol development, regulatory compliance, participant recruitment, and data management. CRS coordinates the logistics of clinical studies, ensuring they run smoothly from initiation to completion while adhering to ethical and legal standards. Examples of this collaboration include the BSSR collecting tissue samples for analysis of tumors from populations that are recruited and enrolled by the BCSR through community-focused interventions, enabling identification of genetic differences that contribute to varied treatment responses. Moreover, the BCSR provides linguistic and culturally adapted study materials for CRS trials. Together, these Sylvester resources create a cohesive and comprehensive framework that enhances cancer research via an integrated approach that combines biological, behavioral, and clinical expertise.

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Sylvester Data Portal: A Comprehensive Platform for Multi-Omics Data Management, Cloud Computing, and AI-Ready Datasets

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The Sylvester Data Portal (SDP), developed at the Sylvester Comprehensive Cancer Center (SCCC), is an innovative multi-omics platform that streamlines the management and analysis of both research and clinical datasets. Leveraging hybrid-cloud computing and adhering to FAIR principles, SDP enhances the findability, accessibility, interoperability, and reusability of securely stored, well-annotated data. Designed for both computational and wet-lab researchers, SDP provides an intuitive user interface and a robust API for efficient programmatic access.

SDP strengthens the Onco-Genomics Shared Resource (OGSR) by providing robust data management with secure storage, comprehensive metadata, and customizable bioinformatics workflows. This integration improves sequencing services by offering automated processing, reproducible workflows, and dynamic visualizations for data exploration and quality control. Currently, SDP supports primary bioinformatics by performing interop analyses for controlling the sequencing run quality, demultiplexing raw sequence data into FASTQ files, and generating MultiQC reports and metrics for thorough quality control evaluation. It also enables secondary analyses such as single-cell RNA-seq and bulk RNA-seq, ATAC-seq, ChIP-seq, and soon, DNA variant analysis.

Additionally, SDP integrates clinical data from genomic profiling vendors, providing IRB-approved researchers access through secure, multi-tiered interfaces. These include the SDP Clinical Dashboard, Clinical Browser, and Clinical Collections, ensuring responsible and compliant data governance. Looking forward, SDP is transitioning to a cloud-computing infrastructure to support large-scale data storage and processing while also preparing datasets to be AI-ready for future advanced analyses. As a comprehensive and evolving platform, SDP is poised to empower researchers to drive breakthroughs in cancer research and precision oncology.

SCCC members are encouraged to leverage the SDP for processing data. Available via UM's Secure Canes and UM's Single Sign-On (SSO) at https://sdp.miami.edu.

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Biostatistics Collaboration and Consulting Core (BCCC)

S. Messinger

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The Biostatistics Collaboration and Consulting Core (BCCC) is organized as a shared resource and operates as a cost center within the Division of Biostatistics in Department of Public Health Sciences. The mission of the BCCC is to provide high quality statistical support for clinical and translational research. BCCC statisticians are available for ongoing statistical collaborations and short-term consulting support to faculty, staff, and students at the University of Miami Miller School of Medicine and throughout the University of Miami. BCCC statisticians are available for collaboration at all stages of research, including but not limited to preparation of grants and contracts, data analysis, and manuscript preparation. Services include: 1) *Support activities:* study design, randomization schemes, statistical analysis plan (SAP), sample size estimation or power analysis, statistical analysis, consulting statistician for staff and professional meetings, abstract/manuscript preparation, grant preparation, survey/questionnaire design, protocol review, safety committee, grant review, and REDCap. 2) *Support options:* a) Grants: biostatisticians are available to provide support in grant development and support funded research as % FTE on a grant budget; b) short-term activities: statistical support on a short-term project specific basis; and c) ongoing collaborative partnerships: statistical support under this structure is designed to ensure available support to an investigator or department/center and foster collaboration and team science. 3) *Educational activities:* the BCCC also offers numerous educational activities, including Biostatistics Roundtable Sessions in which investigators can bring specific statistical questions, Biostatistics Seminars which address a specific area or issue, and Biostatistics Clinics where investigators can bring quick questions without a scheduled appointment. 4) *CTSI support:* BCCC offers biostatistics support to clinical and translational researchers through the Research Design and Biostatistics component of the Miami CTSI. The Miami CTSI catalyzes the development, demonstration, and dissemination of scientific discoveries to improve the health of our community, address health disparities, and promote health equity.

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Virtual Tour of the HIHG Biorepository Core Facility

P. Whitehead[1,2], W. Hulme[1], I. Konidari[1], A. Griswold[1,2], J. McCauley[1,2]

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Come join a virtual tour of the John P. Hussman Institute for Human Genomics (HIHG) Center for Genome Technology (CGT) Biorepository Core Facility, a 6,000+ square foot facility housed in a Category 5 rated multi-use facility. The goal of the Biorepository Core Facility is to create a readily accessible biological specimen bank in support of clinical trials and biomedical research projects. Services include protocol preparation; collection kit preparation, specimen processing, storage, and distribution; laboratory result data management and data analysis; and receipt and shipment of specimens to other research sites. The facility boasts the Azenta BioStore II, which is a fully automated -80°C sample storage system. The Biorepository Core Facility serves as a centralized biological sample bank for several international and cross-institutional collaborative studies. Our mission is to empower students, scientists, and researchers with the tools and expertise needed to unlock the mysteries of genetics and genomics.

Contact:
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The John P. Hussman Institute for Human Genomics (HIHG) Center for Genome Technology (CGT) Biorepository Core Facility

P. Whitehead[1,2], W. Hulme[1], I. Konidari[1], A. Griswold[1,2], J. McCauley[1,2]

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The Center for Genome Technology (CGT), a part of the John P. Hussman Institute for Human Genomics (HIHG), was established in January 2007 at the University of Miami, Miller School of Medicine. The HIHG Biorepository Core Facility is a 6,000+ square foot facility housed in a Category 5 rated multi-use facility. The goal of the Biorepository Core Facility is to create a readily accessible biological specimen bank in support of clinical trials and biomedical research projects. Services include protocol preparation; collection kit preparation, specimen processing, storage, and distribution; laboratory result data management and data analysis; and receipt and shipment of specimens to other research sites. The facility boasts the Azenta BioStore II, which is a fully automated -80°C sample storage system, accommodating a wide range of labware types. Overcoming the challenge of storing and retrieving sensitive samples, this system ensures consistent temperature maintenance throughout the storage and retrieval processes. In addition, the use of highly specialized liquid handling equipment (such as the Hamilton Vantage platform) allows the processing of more samples in less time, minimizing the risk of error and variability in laboratory processes. The Biorepository Core Facility serves as a centralized biological sample bank for several international and cross-institutional collaborative studies. The HIHG occupies 72,000 square feet of contiguous space in the Biomedical Research Building (BRB), shared with the CGT and the Department of Human Genetics. Led by Director Jacob McCauley, Ph.D. and Associate Director, Anthony Griswold, Ph.D., the CGT is dedicated to advancing scientific research by providing cutting-edge genomics services and expertise. Our mission is to empower students, scientists, and researchers with the tools and expertise needed to unlock the mysteries of genetics and genomics. Whether you're a seasoned researcher or new to the field, our facility, working closely with the HIHG Center for Genetic Epidemiology and Statistical Genetics to support experimental design and bioinformatic analysis, offers a range of services to meet your needs.

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The John P. Hussman Institute for Human Genomics (HIHG) Center for Genome Technology (CGT) Sequencing Core Facility

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At our Sequencing Core Facility, we house platforms integral to genomic research. The Illumina NovaSeq X Plus is the pinnacle of high-throughput short-read sequencing, allowing for affordable, high-throughput whole genome sequencing and other sequencing applications. The PacBio Revio and Oxford Nanopore PromethION platforms generate exceptionally long reads with high accuracy and direct methylation detection. This allows for resolution of repetitive regions, structural variation, large-scale genomic rearrangements, inversions, and translocations previously missed by short reads. The 10x Genomics Chromium X enables single-cell sequencing, unlocking the secrets of individual cells within complex tissues. Profile millions of cells simultaneously, under various conditions, and at genome-scale.

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The John P. Hussman Institute for Human Genomics (HIHG) Center for Genome Technology (CGT) Genotyping Core Facility

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The Center for Genome Technology (CGT), a part of the John P. Hussman Institute for Human Genomics (HIHG), was established in January 2007 at the University of Miami, Miller School of Medicine. The HIHG occupies 72,000 square feet of contiguous space in the Biomedical Research Building (BRB), shared with the CGT and the Department of Human Genetics. Led by Director Jacob McCauley, Ph.D. and Associate Director, Anthony Griswold, Ph.D., the CGT is dedicated to advancing scientific research by providing cutting-edge genomics services and expertise. Our mission is to empower students, scientists, and researchers with the tools and expertise needed to unlock the mysteries of genetics and genomics. Whether you're a seasoned researcher or new to the field, our facility, working closely with the HIHG Center for Genetic Epidemiology and Statistical Genetics to support experimental design and bioinformatic analysis, offers a range of services to meet your needs.

At our Genotyping Core Facility, whether you're investigating genetic variations, conducting genome-wide association studies (GWAS), or exploring non-human genotyping, we have decades of experience to guide your research, and your budget. GWAS technologies, such as Illumina Infinium arrays, play a crucial role in unraveling the genetic basis of complex traits and diseases. Our team specializes in designing tailored genotyping solutions for both large-scale and small-scale projects. We'll work closely with you to select the technology and price point that best aligns with your scientific question and budget.

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The John P. Hussman Institute for Human Genomics (HIHG) Center for Genetic Epidemiology and Statistical Genetics (CGESG): Statistical and Bioinformatics Consulting Core

A. Griswold[1,2], D. Van Booven[1], C. Kosanovic[1], B. Kunkle[1], F. Rajabli[1], E. Martin[1,2]

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The Center for Genetic Epidemiology and Statistical Genetics (CGESG) at the John P. Hussman Institute for Human Genomics (HIHG) includes faculty and staff who are leaders in computational genetics and conduct cutting edge research to discover and map genes responsible for diseases in humans and in model organisms. The Center pulls together expertise in genetic epidemiology, statistical genetics, and bioinformatics to advise on experimental design and assist with data analysis. The CGESG is led by Director, Eden R. Martin, Ph.D., a statistical geneticist with experience in theoretical methods development and applied research in development of several association methods. The CGESG houses divisions that support the mission including the Division of Genetic Epidemiology led by Dr. Brian Kunkle, Ph.D., the Division of Research Informatics lead by Dr. Farid Rajabli, Ph.D., and the Statistical and Bioinformatics Consulting lead by Dr. Anthony Griswold, Ph.D. These divisions, along with a staff of bioinformaticians and statistical analysts, offer a range of expertise to assist in research.

The Division of Genetic Epidemiology applies statistical approaches to identify genetic and gene-environmental interaction causes of human diseases. Experienced analysis teams composed of statistical analysts work closely with project PIs on study design, analysis conception, implementation and interpretation, assisting in data management, analysis and reporting of results. Additionally, the Division houses the Statistical Programming Core, which maintains and updates data processing and statistical analysis software and pipelines.

The Division of Research Informatics consists of cross-discipline teams working to help improve the understanding of genetic variation in human health and disease. This includes a group of AI/ML and bioinformatics scientists, software developers and application support engineers providing support for applications in genomic research. Their work encompasses developing applications, managing and analyzing large datasets, maintaining and ensuring the quality of analysis pipelines and creating clinical and medical genetics databases, software and interfaces. In addition, they develop AI/ML-based disease risk prediction models that integrate genetic and non-genetic factors, employing comprehensive machine learning strategies to enhance the accuracy of disease risk assessment.

The Statistical and Bioinformatics Consulting Core provides analytic support for small and large-scale genomics projects including study design, quality control, statistical analysis, interpretation, and assistance with manuscript generation. Working closely with the Center for Genome Technology, the CGESG is prepared to assist with applications including whole genome/targeted DNA sequencing, RNA transcriptomics, single cell sequencing analyses, epigenomics approaches, and many other applications.

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The John P. Hussman Institute for Human Genomics (HIHG) Induced Pluripotent Stem Cell Core

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The mission of the John P. Hussman Institute for Human Genomics (HIHG) Induced Pluripotent Stem Cell (iPSC) Core is to support researchers in their work by offering services, instrumentation, infrastructure, technologies, and expertise to enable the implementation of iPSC-based models of human disease.

The HIHG iPSC Core provides services for the derivation and characterization of iPSC lines from patient blood and tissue samples, as well as peripheral blood mononuclear cell (PBMC) isolation and a broad range of cell culture services, including in vitro differentiation of germ layer cells, neural progenitors, and hematopoietic progenitor cells. All iPSC lines obtained from the Core are fully validated according to standard operating procedure. Our robust quality control testing protocol assesses sterility, pluripotency, loss of episomal reprogramming vectors, chromosomal abnormalities, and mycoplasma. The HIHG iPSC Core also provides hands-on training and consultation services for the incorporation of iPSC-based approaches in disease modeling. Additionally, Core staff possess extensive expertise in the genetic manipulation of iPSC lines utilizing CRISPR/Cas9 gene editing to correct or introduce mutations and welcome opportunities to collaborate on iPSC CRISPR projects.

The iPSC Core facility is in the Biomedical Research Building on the UM medical campus and is a part of the HIHG Center for Human Molecular Genetics (CMG). Our facility is equipped with an Lonza Amaxa 4D-Nucleofector, a Miltenyi MACSQuant Analyzer 10 flow cytometer, an Axion Maestro multielectrode array reader, a Tecan Spark 10M multimodal plate reader with Hydroflex unit, Sartorius IncuCyte ZOOM and SX5 live cell imaging systems, and a Keyence BZ-X810 all-in-one fluorescent microscope for multicolor optical sectioning microscopy that is equipped with an environmental control chamber for live cell imaging. Additionally, the iPSC Core is conveniently located steps away from the HIHG CMG microscopy facility, which houses multiple confocal and fluorescent microscopes, including a Zeiss LSM 780 2 photon/NLO-IR Chameleon laser system, an AxioObserver Z.1 spinning disk confocal microscope, an AxioObserver laser capture microdissection microscope system, and a Thermo Scientific ArrayScan XTI High Content Analysis (HCA) Reader.

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Expert Pathology Customer Care Research Services for Academic and Clinical Research Projects

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The **P**athology **C**ustomer **C**are for **R**esearch (PCCR) is part of the Research Division at the Department of Pathology and Laboratory Medicine (DPLM). As the newest DPLM division, we offer services such as the search and selection of tissue blocks and slides for research, high-quality slide image digitalization, and advanced natural language processing for efficient searches in DPLM electronic medical records (EMR) system (Sunquest, CoPathPlus) and Health Systems EMR chart reviews. Additionally, PCCR responds to researchers' special requests, including sample collection and tissue microarrays; and perform feasibility analyses to ensure pathology requirements are met for clinical trials. Our team of experienced pathologists and clinical research coordinators provide accurate and efficient support to our researchers following the established standard operation procedures. The PCC research team collaborates with the Translational Research Histology Laboratory (Cancer Modeling Shared Resource) to support clinical and academic research as well as clinical trials, through a variety of specialized services. The PCC research team plays a crucial role in enhancing research capabilities and supporting academic research and clinical trials, ensuring the highest quality support for our investigators, and contributing to the advancement of medical science. *Contact us today and see how our PCCR services can enhance your Clinical and Academic Research outcomes.*

Pathology Research Resources: Comparative Pathology Laboratory

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The Pathology Research Resources (PRR) were established in 1982 by veterinary pathologists with the goals of providing animal health testing and services for researchers using animal models of disease. The internationally recognized Comparative Pathology Laboratory, staffed by ten technicians, and managed by a licensed medical technologist with over 20 years of experience, processes over 35,000 clinical pathology samples annually. The staff has expertise in routine hematology and biochemistry testing as well as specialized immunoassays. The laboratory is directed by Carolyn Cray, Ph.D., and supported by Julia Zaias, D.V.M., Ph.D., DACLAM, who each have over 35 years of experience in laboratory animal research and pathology.

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Miami Center for AIDS Research (CFAR)

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The Miami Center for AIDS Research (CFAR) is committed to advancing innovation in HIV/AIDS research by providing exceptional scientific leadership and fostering a collaborative, multidisciplinary infrastructure that integrates basic, clinical, and behavioral/social sciences. Our mission is to promote education, mentorship, and community partnerships that will drive progress in the prevention, treatment, and eventual cure of HIV. With an unwavering commitment to ending the HIV epidemic (EHE), the Miami CFAR is positioned to make transformative contributions to the global fight against HIV/AIDS. To support this mission, the Miami CFAR offers four main research cores designed to empower HIV/AIDS researchers at the University of Miami and across Florida:

- *Laboratory Core:* conducts innovative HIV/AIDS research, provides Immunology, Virology, and Genomics services, supports collaborations and mentorship for investigators at all levels, offers fee-based and collaborative research services, and facilitates access to specialized assays, sample processing, storage, and advanced analytical instruments to enhance study design, data analysis, and grant development.

- *Clinical Core:* provides clinical resources, scientific leadership, state-of-the-art facilities, research design support, biostatistical assistance, and extensive research services to facilitate high-impact HIV translational and multidisciplinary research aimed at improving health outcomes for people living with or at risk for HIV in South Florida.

- *Developmental Core:* supports early-stage investigators, junior faculty, and researchers new to HIV/AIDS by providing developmental awards, mentorship programs, and grant writing workshops to foster career development, enhance research skills, and advance innovative HIV/AIDS studies.

- *Population Engagement Core:* bridges science and community by cultivating partnerships, enhancing stakeholder relationships, and advancing implementation and translational science to ensure impactful and community-informed HIV research.

The Miami CFAR encourages the use of these core services, along with their specialized sub-cores, for researchers to utilize unique resources and foster collaborations to advance groundbreaking discoveries in HIV/AIDS research.

Miami Center for AIDS Research (CFAR) Laboratory Sciences Core

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The primary focus of the CFAR Laboratory Sciences/Advanced Technology Core (Core D) is to conduct innovative HIV/AIDS research, support our funded research base, foster collaborations between basic and clinical investigators and provide mentorship to early-stage investigators, graduate students, and rotating undergraduate students. The core functions as a as a *one stop shop*, allowing investigators to easily access Immunology, Virology, and Genomics services to meet their needs for high-demand- and specialized assays. Additionally, the core offers mentoring support, including consultation, training, and technical assistance, for investigators ranging from students to established researchers. This support addresses their needs for study design, generation of preliminary data, data for publications, and assistance in grant application development. The core provides fee-based services, consultations and collaborative partnerships, which involve the active engagement of core investigators in the scientific process, including study design, assay optimization, and data analysis. Our fee-based services include sample processing, storage, shipping, and HIV reservoir assays. For sample processing, the core can isolate immune cells, plasma, and serum from blood and body fluids. Our sample storage services offer both short and long-term storage with comprehensive tracking and retrieval systems, 24/7 monitoring to ensure sample integrity, and multiple storage environments, including -20, -80, -150, and liquid nitrogen. Furthermore, the core provides access to instruments, such as the Cytek Aurora Flow cytometer, Sony Cell sorter, and ELIspot/Fluorospot reader, on a fee-based basis. In terms of collaborative research, core investigators collaborate with principal investigators (PIs) to develop their experiments. This includes high-dimensional flow cytometry for immunophenotyping and the characterizing antigen-specific immune cell phenotype and function, cell sorting, multiplexed high sensitivity biomarker analysis, and antibody assays targeting influenza, HIV, Mpox, and SARS-CoV2, as well as ELIspot/Fluorospot for assessing antigen-specific T and B cell function. The core also offers virology services such as single genome amplification for phylogenetic analyses. Our genomics service, in collaboration with the Sylvester Onco-Genomics Shared Resource, includes single-cell RNA-seq, shotgun microbiome sequencing, and single-cell multiomics involving combined transcriptional (Sc-RAN-seq), epigenetic (ATAC), repertoire (TCR/BCR), and surface protein analysis. Key indicators of the core's activities include cost recovery, grants submitted, training and mentoring support for pilot awardees, early-stage investigators (ESIs), and investigators new to HIV research, as well as publications that acknowledge core support. The core welcomes requests for consultations at all stages of the study, including during project development. Services and free consultations can be requested online at https://redcap.miami.edu/surveys/?s=FRJL83YYR7.

Laboratory for Clinical Bioscience (LCB): Gateway to Research and Clinical Laboratory Testing.

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The Laboratory for Clinical Bioscience (LCB) in the Department of Pathology and Lab Medicine (DPLM) supports research projects funded by federal, state, and local agencies, industry partners, as well as investigator-initiated studies. One of the primary functions of the LCB is to facilitate clinical research through the processing and distribution of specimens into the components needed for clinical testing and research purposes. The LCB has expertise with most types of human and some animal samples and can perform complex processing as needed for a particular study. The laboratory performs traditional sample centrifugation and aliquoting, DNA/RNA extraction, short-term cell culture, as well as mononuclear cell isolation and storage. The LCB participates in the NIH Immunology Quality Assessment (IQA) mononuclear cell preparation and cryopreservation proficiency testing program. Additionally, the LCB can facilitate both routine and specialty laboratory clinical tests performed at the DPLM at the UHealth Tower, Sylvester, various UM laboratories, or external laboratories. This provides investigators access to a wide range of laboratory testing, including clinical chemistry, hematology, immunology, serology, microbiology, and molecular diagnostics.

Analytical services with solid-phase platforms (ELISA, Luminex) and molecular biology platforms are available in the LCB. Traditional ELISA testing can be performed for nearly any commercially available ELISA-based biomarker. The LCB has a powerful Luminex xMAP INTELLIFLEX System, an advanced multiplexing platform designed for biomarker analysis and discovery. This system can detect hundreds of cytokines, chemokines, and growth factors across various sample types. If an investigator is interested in several biomarkers, multiplex testing may be more cost-effective than ELISA and offer deeper insight into biological pathways. Contact the LCB to discuss multiplexing options and approaches to pathway analysis. The LCB has direct access to the Roche Cobas 5800 analyzer, a clinical-grade nucleic acid testing system capable of performing both qualitative and quantitative tests for a wide range of infectious diseases. Additionally, the LCB has direct access to quantitative PCR (qPCR, QuantStudio 7) and digital PCR (dPCR, QIAcuity 5-plex System) for custom assay development and validation. The LCB participates in the NIH Virology Quality Assurance (VQA) proficiency testing program for quantitative HIV copy number. Contact the LCB to discuss focused molecular biology research projects. A hallmark of the LCB is its flexibility and ability to offer custom approaches to clinical research questions. Reach out to us to discuss possibilities!

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Clinical Translational Research Site (CTRS)

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The Clinical Translational Research Site is a specialized clinical research unit that provides University of Miami investigators with the expertise, infrastructure, and oversight needed to conduct high-quality research in a safe and patient-friendly environment and ensure that trials are conducted ethically and effectively. Our skilled and experienced clinical research nurses, coordinators, and medical assistants will work closely with you to assess your needs. Our team is credentialed to provide services for specific research protocols at Jackson Health System. CTRS provides clinical research services for federal, foundation, and industry-sponsored protocols at multiple locations on the medical campus. Our laboratories at all CTRS locations operate under CLIA certificates.

We can help you with:

- Clinical research coordinator services
- Clinical research nursing assistance with various medical procedures (e.g., lumbar punctures, biopsies)
- Study design and feasibility
- Budgeting for clinical trials
- Data collection and data entry
- UHT / CTRS ancillary review committee approvals

We provide multiple services:

- Medication administration/ infusions (IV, oral, SQ injections)
- Standardized meal tolerance test (MMT)
- Peripheral blood mononuclear cell (PBMC) isolation
- Pharmacokinetic studies (PKs)
- Vital signs, height, and weight assessment
- Oral and IV glucose tolerance testing (OGTT, IVGTT)
- Phlebotomy
- Electrocardiogram (EKG)
- Administration of research tests and procedures
- Collection, processing, and shipping of biological samples

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BioNIUM Nanofabrication Facility

B. Motlagh

Dr. John T. Macdonald Foundation Biomedical Nanotechnology Institute, University of Miami, Miami, FL, USA

The *Dr. John T. Macdonald Foundation Biomedical Nanotechnology Institute of the University of Miami (BioNIUM)* is an institute for interdisciplinary science, focused on the application of nanotechnology to medical care at the University of Miami. The *BioNIUM Nanofabrication Facility* occupies 2,800 ft^2 space in the UM Converge Miami Building. The facility consists of Class 100 and 1000 Cleanrooms and state-of-the-art equipment supporting successful micro- and nanofabrication crucial to numerous technologies. The Institute's goal is to offer the expertise, infrastructure, and resources necessary to energize fundamental aspects of nanotechnology and to foster interdisciplinary research programs, capturing the essence of collaboration and shared growth across multiple disciplines. Aims include 1) enable technologies that solve global biomedical & environmental challenges through discovery and innovation; 2) educate the next generation of scientists, physician scientists, and engineers in nanoscience and nanotechnology; and 3) engage the community by disseminating technologies and discoveries through STEM activities. The BioNIUM Nanofabrication Facility has capabilities for thin-film deposition, film etching and characterization, photolithography, electron beam lithography, and scanning electron microscopy, enabling support of research in the following areas:

- Semiconductor manufacturing technologies: electronic chips and nanoelectronics devices, gas, chemical, and biological sensing sensors
- Biomedical devices: biosensors, micro filters, microneedles, other micro tools
- MEMS, NEMS, BioMEMS: organ-on-a-chip devices, microfluidics
- Optoelectronic and nanophotonic devices: waveguides, LED, photodetectors, solar cells
- Nanomaterials: 1D & 2D material growth
- Characterization and packaging of nanoparticles and drug delivery

Equipment:

- Metrology and imaging**:** SEM, EDS, AFM, optical microscopy
- Packaging: ball and wedge bonding, parylene coating, dicing
- Etching: RIE, wet etching, O_2 plasma cleaner
- Thin-film deposition: E-beam / thermal evaporation, DC/ RF sputtering, PECVD
- Photolithography and lithography: photolithography, mask aligner, EBL, profilometry
- Thermal processing: high temperature tube furnace (1000℃), RTP
- Pharmaceutical processing: nanoparticles fabrication and characterization

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Advancing Clinical Translation: The Clinical Research Cell Manufacturing Program (CRCMP) at the Interdisciplinary Stem Cell Institute (ISCI)

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The *Clinical Research Cell Manufacturing Program (CRCMP)* within the Interdisciplinary Stem Cell Institute (ISCI) is dedicated to accelerating the translation of basic research discoveries into viable therapeutic cellular products. Our mission is to unite leading scientists worldwide in the pursuit of innovative stem cell clinical trial research and regenerative medicine advancements. At the heart of CRCMP's operations is our core objective, facilitating rapid and safe transition of basic research ideas. The CRCMP offers a comprehensive suite of services aimed at swiftly and safely transitioning basic research ideas into clinical applications. This includes the qualification and testing of reagents, scale-up of methods, development of Standard Operating Procedures (SOPs), ongoing process validation, and the provision of a controlled Good Tissue Practice (GTP) and Good Manufacturing Practice (GMP) infrastructure.

Key features of the CRCMP include:

- *Expertise in process optimization:* Our team of skilled professionals excels in optimizing processes for the manufacture of therapeutic cellular products. From initial feasibility assessments to full-scale production, we ensure efficiency and compliance at every step.

- *Regulatory compliance and support:* As a FACT- and AABB-accredited institute as well as a FDA registered facility, the CRCMP adheres to the highest standards of quality and safety. We provide comprehensive support for compiling Investigational New Drug (IND) applications, guiding researchers through regulatory requirements to expedite the path to clinical trials.

Please contact us to learn more about the CRCMP's role in driving forward the translation of stem cell research into transformative therapies. Together, let's pave the way for groundbreaking advancements in regenerative medicine.

DRI cGMP Advanced Cell and Biologic Product Manufacturing Facility: Development of Islet-Like Cell Clusters from Banked iPSC for Transplant, Disease Modeling and Drug Screening Applications

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Islet transplantation holds promise as a therapeutic approach for Type 1 Diabetes (T1D). However, its clinical application is hindered by the limited availability of donor islets, immune rejection, and challenges in engraftment. Induced pluripotent stem cells (iPSCs) offer a renewable and scalable alternative for generating functional beta-like cells, potentially addressing these barriers. This study investigates the feasibility of using banked iPSC lines to generate stem cell-derived islets (SC-islets) as a viable and clinically translatable strategy for T1D therapy.

Two research-grade iPSC banks were established from cord blood and pancreatic islets using a Sendai virus reprogramming method. The iPSC lines were characterized for pluripotency markers (SSEA4, SOX2, OCT3/4) with >90% expression and validated through karyotype analysis (Karyostat assay) and Pluritest assessments. For differentiation into pancreatic lineages, iPSC clones were screened for endodermal markers (SOX17, FOXA2) and subjected to a stepwise differentiation protocol adapted from Millman et al. (2021). The resulting SC-islets were evaluated for insulin and glucagon expression via immunostaining, and their functional capacity was assessed through glucose-stimulated insulin secretion (GSIR) assays. Selected iPSC clones successfully differentiated into islet-like clusters, exhibiting insulin and glucagon expression confirmed by staining of insulin and glucagon. GSIR assays has not yet confirmed insulin secretion in response to glucose stimulation, which is essential for demonstrating initial functional activity. Key challenges identified include optimizing differentiation efficiency, enhancing NKX6.1 expression, and refining the final maturation stage to improve beta-cell functionality.

This study highlights the potential of iPSC-derived SC-islets for T1D therapy, with ongoing efforts focused on improving differentiation protocols and functional maturation. Future directions include integrating gene-editing technologies (e.g., CRISPR-Cas9) to generate immune-evasive iPSCs, reducing the need for immunosuppression. Additionally, pre-vascularization strategies, such as vascularized iβ spheroids (ViβeSs) incorporating induced endothelial cells (iECs), may enhance engraftment and insulin secretion. Beyond transplantation, iPSC-derived beta-like cells provide a valuable platform for disease modeling and drug screening in diabetes research. Standardized iPSC banking systems will be critical for ensuring scalability, consistency, and clinical translation of this promising regenerative approach.

DRI Preclinical Cell Processing and Translational Models Animal Core

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The mission of the Diabetes Research Institute (DRI) is to develop and apply the most promising research to treat and cure those now living with diabetes in the fastest, safest, and most efficient way possible. The *DRI Preclinical Cell Processing and Translational Models Animal Core* at the University of Miami (UM) Miller School of Medicine is directed by Joel Szust, DVM, CPTC, CTOP, and provides access to advanced cell processing technologies, tissue procurement, *in vitro* and *in vivo* technologies, and access to different transplant sites utilizing small animal models. The core is open to DRI faculty and staff, DRI collaborators, other UM faculty and staff, and investigators outside of the UM research community. Services are provided to researchers with IACUC approved protocols. Animal procedures include drug administrations (orally, IM, SC, IP, IV); bleeding; diabetes models short- and long-term care; metabolic testing such as IPGTT and MMT; diabetes monitoring; comprehensive necropsies; cellular transplants in different sites as well as pumps and scaffolds implantations; post-surgical care and monitoring; planning and protocol development; and training in various areas.

Advancing Research with the DRI Analytical Imaging Core Facility

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The Diabetes Research Institute (DRI) Analytical Imaging Core Facility (AICF) at the University of Miami plays a pivotal role in advancing scientific discovery. Our facility provides cutting-edge technologies, specialized equipment, and expert services that foster collaboration and enhance research productivity.

The following instruments are hosted at the AICF:

- *Leica STELLARIS 5* is a cutting-edge confocal microscope platform that sets a new standard for high-quality imaging and information generation. Features include an Integrated White Light Laser (WLL). The STELLARIS 5 is the only confocal system with an integrated next-generation WLL, which allows simultaneous unrestricted use of multiple single excitation lines across the spectrum, expanding options for fluorophore combinations and labels 405 nm to 850 nm into the NIR range. This instrument also has TauSense technology, which extracts an extra layer of information (lifetime of the dye) from every sample, enabling reduction of background noise and use of close-colored dyes.

- *Olympus VS120 Virtual Slide Microscope* allows scanning of whole slides in fluorescent and brightfield mode (IHC, HE) with minimal hands-on time, and the generation of publication-quality images at x2-x40 magnification.

- *Leica LMD (laser microdissection system)* enables precise isolation of specific live cells or tissue regions from slides for downstream analysis, including downstream DNA, RNA and protein sequencing.

- *Leica TCS SP5 UPRIGHT Confocal Microscope* delivers bright, noise-free images with minimal photo damage at high speed and is used in whole animal and tissue live imaging. The SP5 has an animal holder for intraocular access and a gas anesthesia unit for mouse work.

The AICF provides assistance with automatic image quantification, including complex custom pipelines, and provides guidance on how to get the best possible, scientifically accurate data.

DRI Flow Cytometry Core

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The mission of the Diabetes Research Institute (DRI) is to develop and apply the most promising research to treat and cure those now living with diabetes in the fastest, safest, and most efficient way possible. The DRI Flow Cytometry Core Center, directed by Oliver Umland, Ph.D., provides access to advanced flow cytometry technology to DRI faculty and staff, DRI collaborators, and other investigators within and outside of the UM research community. The DRI Flow Cytometry Core Center houses a Beckman Coulter MoFlo Astrios EQ high-speed cell sorter enclosed in a BSL-2 biosafety cabinet, a Cytek Aurora full spectral analyzer, and a Beckman Coulter CytoFLEX S. Services include high-speed cell sorting of samples requiring BSL-2 containment, self-operated or assisted sample analysis, instrument and software training, consulting and experimental design, and data analysis using SpectroFlo, CytExpert, or Kaluza software. Cell sorting is available Monday-Friday from 10am-6pm; fully trained personnel with approved building access have 24/7 access to the two analyzers.

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DRI Biomarker and Immunoassay Core Laboratory

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The Biomarker and Immunoassay Core Laboratory at the Diabetes Research Institute performs assays for the evaluation of metabolic control, hormone levels and disease biomarkers in human blood, urine, and saliva samples in support of clinical research studies and samples from *in vitro* experimentation (e.g., cell culture medium) in support of pre-clinical studies. The laboratory was established in 1986 by Ronald Goldberg, M.D., who continues to serve as the Medical Director. The laboratory is inspected by the State of Florida and has Clinical Laboratory Improvement Act (CLIA) certification and follows all CLIA guidelines established by for quality control and proficiency testing to ensure reliable, dependable, and meaningful results.

The lab has continuously provided services for the clinical research activities of the DRI and other University of Miami investigators since its inception. In addition to our current test menu, the lab can establish new methods as needed to meet the needs of investigators. The lab is experienced in best practices for sample collection and can provide guidance and protocols for standardized collection methods to minimize pre-analytical sample loss and improve stability until sample analysis can be completed.

Laboratory personnel have extensive experience with chemistry, special chemistry, and immunoassay methods utilizing automated and manual procedures. The laboratory is equipped with a Roche-Cobas 6000 analyzer for automated chemistry and immunoassay testing, all instrumentation needed for performing manual immunoassays (ELISA and radioimmunoassay) and a Luminex 200 analyzer for bead-based multiplexed immunoassays.

The Center for HIV and Research in Mental Health (CHARM)

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The mission statement of the Center for HIV and Research in Mental Health (CHARM) is "To promote, develop, and support high-impact, high-quality, community-engaged HIV research addressing mental health and related disparities as a scientific, strategic, and mentoring resource to end the HIV epidemic." The *Administrative (Admin) Core,* as an organizational hub, provides Center leadership, strategic planning, and coordinates cross-Core activities. The *Developmental Core* awards pilot studies and mentors early-stage investigators and investigators new to HIV/mental health research. The *Methods Core* provides innovative research design, biostatistical (e.g., multilevel modeling, machine learning, geospatial analysis), data management, and qualitative research expertise, and maintains the data elements for the Center's consent-to-contact databases and a REDCap measures library. The *Mental Health Disparities and Community Engagement (MHD-CE) Core* houses our community engagement activities and provides expertise and resources to promote culturally competent approaches, tools, and interventions for ethical, multi-level, community-engaged research addressing MH and HIV-related health disparities. The *Equitable Implementation Science (EIS) Core* provides design and implementation science resources and expertise to extend the equitable reach of evidenced-based interventions.

Gallery of Images from Imaging Core Facilities at the University of Miami Miller School of Medicine

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This poster showcases the high-impact results that are possible using the diverse range of advanced imaging platforms available at five imaging core facilities at the University of Miami (UM) Miller School of Medicine (MSOM), including the Sylvester Comprehensive Cancer Center (Sylvester) Flow Cytometry Shared Resource (FCSR), Sylvester Cancer Modeling Shared Resource (CMSR), Maimi Project to Cure Paralysis (Miami Project) Imaging Core, Miami Project Drug Discovery Core, and Miami Project Transmission Electron Microscopy (TEM) Core Facility. Examples include optical microscopy still images and videos, electron microscopy images, and *in vivo* non-invasive whole animal images from five different platforms. The Sylvester FCSR offers imaging services that include imaging mass cytometry with a Standard BioTools CyTOF Hyperion, and confocal, super-resolution, and live-cell microscopy with a Zeiss LSM980 microscope with Airyscan 2 (providing super resolution down to 120 nm, and down to 90 nm with deconvolution), equipped to image live or fixed tissues or cells. The capabilities of this confocal microscope include widefield epifluorescence, transmitted light, multiplex, tile scanning, 3D reconstruction, and multispectral imaging utilizing a variety of sample carriers, including chambered slides and microwell plates. The Sylvester CMSR supports diagnosis and evaluation of responses to treatment in a pre-clinical setting with noninvasive *in vivo* small animal imaging and histopathological analysis. Imaging modalities include whole animal fluorescence and bioluminescence (IVIS), small animal MRI, nuclear imaging with a PET/SPECT/CT system, high-frequency ultrasound imaging, X-ray image-guided irradiation, and fluorescence-based slide scanning. The Miami Project Imaging Core and Miami Project Drug Discovery Core offer complimentary imaging methods, including a Perkin Elmer Opera Phoenix high content screening platform for cell-based assays, such as cell painting (i.e., unbiased feature screening) in microwell plates; an Andor Dragonfly 600 spinning disc confocal microscope providing high-speed optical sectioning and super-resolution; a 3i Lightsheet microscope for high speed imaging in 3D, and a stereology microscope for 3D reconstructions in brightfield. The Miami Project TEM Core offers the only TEM instrument at MSOM, and provides sample preparation services that include embedding, sectioning, and imaging of tissues and cells. TEM uses electrons instead of visible light to image biological material and offers very high-resolution images, on the order of angstroms. All these imaging core facilities offer high level expertise, consultation on project design and data analysis, training on instrument use, and access to advanced image analysis software.

Miami Project Imaging Core

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The *Imaging Core* at *The Miami Project to Prevent Paralysis* provides state-of-the-art equipment and services for all UM researchers. We offer training and support in advanced light microscopy techniques, including spinning disk confocal, super-resolution imaging, lightsheet imaging of cleared organs, and stereology systems. The Imaging Core also provides access to image analysis software (Imaris Neuroscience Package) with capabilities such as 3D image rendering, surface creation, spot detection, and filament tracing. Our mission is to deliver cutting-edge digital imaging technologies to support high-quality, interdisciplinary data acquisition across multiple laboratories

Miami Project Drug Discovery Core

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The *Drug Discovery Core (DDC)* at *The Miami Project to Cure Paralysis* leverages the Revvity Opera Phenix Plus high content screening (HCS) platform to provide researchers with state-of-the-art assay development and phenotypic screening capabilities. The facility is also equipped with a Revvity Janus G3 liquid handler, featuring modular and variable dispense heads, to automate screening workflows and enhance throughput. The core supports a wide range of phenotypic and target-based assays. Phenotypic assays range from 2D to 3D, widefield to confocal, and antibody to dye based. It collaborates with users to develop customized assays and analytical pipelines tailored to their specific needs. Current specializations include neurite tracing, lipid droplet quantification, cell viability, morphological and kinetic analyses, phagocytosis, cell marker detection, and cell adhesion.

Miami Project Transmission Electron Microscopy (TEM) Core

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As the only Core of this type for the entire University of Miami, the Transmission Electron Microscopy (TEM) Core has had a long-standing tradition of providing quality electron microscopy services for all interested investigators. Electron microscopy has been an invaluable tool for those investigators whose research projects require high magnification and high-resolution images of cellular ultrastructure and nanoparticles. Our dedicated staff has the expertise needed to advise investigators on how EM can further advance their research goals. We are committed to providing the best service possible, from careful fixation of the tissue for optimal preservation to acquiring the best quality images in the electron microscope. The TEM Core operates under the aegis of The Miami Project to Cure Paralysis and maintains two JEOL JEM-1400 transmission electron microscopes, both equipped with AMT digital cameras. The microscopes received the Clinical Laboratory Improvement Amendments (CLIA) Certification by the State of Florida Agency for Health Care and Administration, thereby accrediting them for imaging clinical specimens. The TEM Core is capable of handling many types of samples and utilizing several different tissue preparations, such as: resin embedding of biological tissues as well as cell cultures and pellets; semi-thin (1µm) sectioning for light microscopy analysis; thin (100nm) sectioning for electron microscopy analysis; loading of exosomes and nanoparticles onto Formvar-coated carbon grids for electron microscopy analysis; and specialty resin (LR White) embedding and sectioning of specimens for immunogold labeling of thin sections on nickel grids.

ICRT- Imaging Core for Research and Training - Vascular Biology Institute

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The Interdisciplinary Stem Cell Institute (ICRT) at the University of Miami (UM) offers specialized services to support the UM community, external institutions, and private companies. The Vascular Biology Institute (VBI) Imaging Core for Research and Training at the ICRT provides high quality angiographic technology and the superior soft tissue contrast of MRI to explore new fields to advance interactive and interventional imaging. The Core's angiographic surgical suite is a fully equipped operating room dedicated to pre-clinical research and training for medium-to-large animals. This suite features the Axiom Artis, a biplane flat detector X-ray system that offers includes cardiac, neuro and vascular packages, as well as 3D reconstruction angiography, and Dyna CT imaging. The MRI suite focuses on developing and optimizing MRI methods for cardiovascular and neuroimaging of both *in vivo* and *ex- vivo* procedures. The Magneton Trio A Tim is a 3T system that offers a wide range of coils for working with small and large animals and includes software for applications in neurology, cardiology angiography, oncology and orthopedics.

The VBI provides expert support for designing and implementation of *in vivo* and *in vitro* procedures that require endovascular techniques as part of research, testing or training projects. Its capabilities include fluoroscopy, rotational angiography, digitally subtracted vascular structures and 3D X-ray imaging as essential tools for analyzing diseases, treatments, and medical device performance. Our portfolio includes ischemia models such as myocardial infarction and peripheral artery disease, as well as vascular conditions like aneurysms and arterio-venous malformations. We also support selective vascular drug delivery for cancer treatment and orthopedic device implantation studies.

The hands-on endovascular training provided enhances the skills of interventional specialists, familiarizing them with the latest minimally invasive techniques and technologies. This experience can also be integrated in course curricula. Additional services include animal ordering, catering coordination for workshops, and conference room access.

The Frost Institute for Chemistry and Molecular Science: Centers of Excellence in Molecular Electron Microscopy, Mass Spectrometry, and Protein Chemistry

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The Frost Institute for Chemistry and Molecular Science is developing three experimental Centers of Excellence: 1) the Molecular Electron Microscopy Center; 2) the Center for Mass Spectrometry; and 3) the Center for Biophysical Protein Characterization. These Centers will facilitate protein chemistry, biophysical chemistry, chemical biology, medicinal chemistry, structural biology and structure-based drug design.

1) The *Molecular Electron Microscopy Center* (MEMC) enables "imaging from atoms to cells." MEMC rooms are designed to minimize vibration, acoustic interference, stray magnetic fields, and fluctuations in temperature and humidity. MEMC's installed ThermoFisher instruments include a Glacios 2 for screening of soft beam-sensitive biological materials such as protein complexes, a Krios G4 for molecular resolution imaging of frozen-hydrated biological samples to determined high-resolution 3D structures, a Spectra for atomic resolution imaging of hard materials, and a Talos 200C for training purposes and sample screening. An Arctis instrument will be installed by the end of 2025 and will enable correlated light and electron microscopy and fib-milling of cells and tissues to perform electron cryotomography to generate 3D cellular maps.

2) The *Center for Mass Spectrometry* is comprised of four state-of-the-art ThermoFisher instruments for pursuing proteomics, metabolomics, lipidomics, and conformational dynamics of macromolecular complexes. The instruments are capable of detecting an 80 Dalton mass addition due to phosphorylation, as well as mass changes due to binding of ligands, cofactors, lipids and drugs. The stoichiometry and components within megadalton macromolecular complexes can also be examined. Conformational dynamics can be explored using hydrogen-deuterium exchange of amide hydrogens within a complex and proximity relationships via chemical crosslinking.

3) The *Center for Biophysical Protein Characterization* has state-of-the-art instruments to characterize protein purity, stability, oligomeric states, and modifications such as phosphorylation and binding of ligands and drugs. Such measurements are essential in the pursuit of the molecular basis of signaling mechanisms, normal and pathologic physiology, and structure-based drug design.

Our current focus is recruitment of additional staff scientists and research faculty to enable access to our Centers for all scientists at the University of Miami as well as from external academic and industry institutions.

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Shared Research Resources of the University of Miami Department of Chemistry

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The Chemistry Department at the University of Miami (UM) offers state-of-the-art instruments and services to both academic and industry users, including:

1. Nuclear Magnetic Resonance (NMR) Laboratory has four NMR systems:
    a. 300MHz (with auto sampler)
    b. 400MHz (with solid state probe, liquid state probe and imagery probe)
    c. 500MHz (with cryoprobe and autosampler)
    d. 800MHz (with cryoprobe and autosampler)

2. Mass Spectrometry Laboratory has three mass spectrometers:
    a. MicroQ-TOF ESI
    b. MALDI-TOF
    c. GC/MS with autosampler

3. Shared Instrument Laboratory (UV-Vis, UV-Vis-NIR, FTIR, TGA, EPR, HPLC, TOC, etc.)

Researchers from the UM community as well as from academic and commercial entities outside the University are welcome to use our facility. Our fee schedule is competitive with the fees of similar shared resources at other academic institutions.

Miami Engineering Shared Facilities – College of Engineering Shared Services

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The University of Miami College of Engineering (UMCoE) core facilities are called the "Miami Engineering Shared Facilities" and offer the following services:

- Metal additive manufacturing
- Polymer 3-D printing
- Machine shop facilities
- Material characterization equipment suite

The metal additive manufacturing (3D printing) equipment includes three powder bed fusion metal printers, Tekna Tek plasma atomizer, vacuum arc melter, and a planetary ball mill. One of these metal 3D printers is the EOS M100 prototyping printer, which is utilized for parameter set development. We also have a full suite of polymer 3D printers capable of printing various materials such as PLA, ABS, UV photopolymerized resin, carbon, and multi-jet printers. In addition, we have a fully functional machine shop with lathes, band saws, two computer numerical control (CNC) equipment, wire EDM, and weld shop capabilities.

UMCoE also houses a full suite of material characterization equipment for multiscale physico-chemical characterization of materials such as ceramics, metals and alloys, electronic components, and biological specimens. The shared facility houses laser diffraction and Brunauer-Emmett-Teller (BET) equipment (for particle size and specific surface area analysis), X-ray diffractometer, environmental scanning electron microscope (SEM), and a field emission scanning electron microscope with a nanoindenter (for micro- and nano-structural characterization), and differential thermogravimetric analysis and differential scanning calorimeter equipment for phase characterization.

All the instruments in the Miami Engineering Shared Facilities can be reserved for use through the core's iLab portal at https://tinyurl.com/scmcf.

Magnetic Resonance Imaging (MRI) Neuroimaging Facility: a Resource for Imaging the Human Brain and Body

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The Magnetic Resonance Imaging (MRI) Neuroimaging Facility occupies 1200 sq. ft. on the first floor of the Cox Annex Neuroscience building on the University of Miami's Coral Gables campus. The Facility includes an MRI scanner suite with associated reception and waiting areas, dressing room, and an MRI simulator/mock scanner suite. The Facility has a state-of-the-art Siemens Magnetom Vida 3.0T MRI scanner (Erlangen, Germany). This is a wide bore whole-body scanner with a high-performance gradient system and phased array coils to provide highest possible image quality. This instrument can perform advanced imaging for neuro, cardiac, abdominal, and orthopedic imaging. The scanner suite is equipped to deliver visual, auditory, and tactile stimuli. In addition, the Facility has Resoundant Hardware to perform MR elastography of the liver.

Services include:

- Advanced structural and functional imaging
- Access to a physicist and MRI technologist
- Time on the scanner and/or mock scanner
- Safety training for research teams
- Equipment to present stimuli, record behavioral responses, and measure psychophysiology and eye-tracking:
    - MRI System Simulator
    - Current Designs 932 fORP Response Devices (4-button diamond, 4-button inline, 5-button Pyka, Trackball2)
    - Hyperion MRI Digital Projection System
    - Biopac Physiological Recording (heart rate, respiration, skin conductance response, electrocardiography, electromyography, blood pressure)
    - Resonance Technology Eye-tracking
    - Video camera monitoring

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Miami Integrative Metabolomics Research Center (MIMRC) Ophthalmology Mass Spectrometry Core Facility

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The Miami Integrative Metabolomics Research Center (MIMRC) of the Bascom Palmer Eye Institute at the University of Miami Miller School of Medicine aims to identify therapeutic strategies through the differences between control and disease states by qualitative and quantitative proteomics, lipidomics, and metabolomics. The Ophthalmology Mass Spectrometry Core Facility provides services to researchers at the University of Miami and its surrounding educational and health care institutions. We perform techniques such as TMT for protein identification and Isotopic Ratio Outlier Analysis (IROA) for metabolite quantification. To conduct various analysis, we utilize instruments such as the Q Exactive and TSQ alongside software's such as Proteome Discoverer, Lipid Search, and Compound Discoverer.

Virtual Tour of the Surge-Structure-Atmosphere Interaction Laboratory (SUSTAIN)

B.K. Haus

Rosenstiel School of Marine, Atmospheric and Earth Sciences, University of Miami, Key Biscayne, FL, USA

The Alfred C. Glassell JR. Surge-Structure-Atmosphere Interaction Laboratory (SUSTAIN) is located on the University of Miami's Rosenstiel School of Marine and Atmospheric Sciences campus. SUSTAIN provides a unique capability to generate directional waves combined with direct wind forcing. The facility can generate air velocities equivalent to a wind speed >90 m s^{-1} (i.e., equivalent a very strong category 5 hurricane). The SUSTAIN tank is 23 meters long, six meters wide, and two meters high. The 18-meter-long test section is constructed of acrylic material to allow innovative optical measurements such as polarimetric slope sensing and particle image velocimetry techniques. SUSTAIN has a suite of instrumentation to observe the physical, biological and chemical processes in winds and waves.

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Alfred C. Glassell JR. Surge-Structure-Atmosphere Interaction Laboratory (SUSTAIN)

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A significant component of the Marine Technology and Life Sciences Building at the University of Miami's Rosenstiel School of Marine and Atmospheric Sciences campus is the Alfred C. Glassell JR. Surge-Structure-Atmosphere Interaction (SUSTAIN) Laboratory. SUSTAIN provides a unique capability to generate directional waves combined with direct wind forcing. The facility is equipped with a single 1460 HP fan that has generated air velocities in the test section of up 65 m s^{-1}. When the winds are scaled by a boundary layer profile, this is equivalent to a wind speed >90 m s^{-1}, or a very strong category 5 hurricane. To generate directional waves (with ~11° resolution), a computer-controlled series of 12 piston-type hydraulic wave paddles manufactured by HR Wallingford are positioned immediately underneath the air-intake duct.

The SUSTAIN tank has a total dimensions of 23-m long x 6-m wide x 2-m high. The 18-m long test section is constructed of acrylic material to allow innovative optical measurements such as polarimetric slope sensing and particle image velocimetry techniques. The acrylic is mounted within a stainless-steel frame that is used to rigidly mount instrumentation. SUSTAIN is entirely composed of materials to allow saltwater use. An aluminum parabolic segmented sloping beach with a 1-m horizontal section at the end of the test-section is located at the opposite end of the facility from the wavemaker, this provides an additional mounting surface and dissipation of incident wave energy to reduce reflections. The test section is elevated to the first floor above grade and has a high-bay ceiling to allow optimal flexibility for test equipment. SUSTAIN has offices for staff and the director, electrical and computer laboratories, a specimen fabrication shop and a roll-up entrance door and overhead hoist to handle large specimens.

SUSTAIN has a suite of instrumentation to observe the physical, biological and chemical processes in winds, waves and extreme winds. Available instrumentation includes laser elevation gauges, multiple wire wave gauges to allow removal of reflected waves at the paddles (12 sensors) and to map the overall water surface in the test section (8 point gauges), laser slope gauges, ultrasonic wave sensors, a standard 15 Hz particle image velocimetry system, hot-film anemometry, a laser spray imaging system, infrared and polarimetric cameras, multi-port pressure sensor, current meters and multiple sonic anemometer flux measurement systems.

Recent experimental studies have been conducted for NIST, NSF, DARP and the National Academy of Sciences. SUSTAIN is also working with private entities developing "Climate Tech," including wind and solar energy as well as dissipative seawalls and reef structures.

The Glassell Family Center for Marine Biomedicine: Establishing Cross-University Connections in Human Health Research

MD. McDonald

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The Glassell Family Center for Marine Biomedicine is dedicated to integrating the Rosenstiel School's world-class expertise in marine biology, oceanography, atmospheric science, and social science with the cutting-edge human health research of the University of Miami's Miller School of Medicine, School of Nursing and Health Studies, and School of Engineering. Rosenstiel atmospheric scientists and chemists are experts in measuring the changing environment, such as rising air temperatures, increased incidence of algal blooms, and chemicals present in the air and water to which humans can be exposed. Rosenstiel social scientists investigate the environmental and societal contribution to health risk, such as the intersection between socioeconomic status, environmental change, and susceptibility to cancer. Rosenstiel marine biologists work on growing heart and brain healthy food in our University of Miami Experimental Hatchery, as well as study marine organisms to answer questions about the impact of environmental exposures on human health and mechanisms of human health and disease using a variety of marine animal models. For example, using the California sea hare to study the neurobiology of aging because of its simple nervous system and short life span, or using the Gulf toadfish to study hepatic encephalopathy, since their brain astrocytes show an exceedingly high tolerance to ammonia. Rosenstiel scientists are excited to collaborate with the rest of the University on human health and disease problems. Together, we can innovate and advance discoveries in treating the world's leading diseases - cancer, heart disease, and stroke - and health risk factors - aging, pollution, extreme weather, socioeconomic status, and environmental change. Please email Dr. Danielle McDonald if you wish to be a part of the Glassell Family Center and to be more connected with the human health work being done at the Rosenstiel School.

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The National Aplysia Resource

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The National Aplysia Resource is an NIH sponsored resource program that ships about 8,000 laboratory-reared California sea hares (Aplysia californica) per year, at all stages of development, to researchers throughout the world. In the 30 years since this NIH funding for this Resource started, we have shipped nearly 500,000 animals. A. californica is an important model for neuroscience, and particularly for understanding the cellular basis of memory and learning, due to their simple nervous system and very large neurons. These animals are also widely used in neuroscience teaching laboratories. One of the major goals of the Resource is to develop new uses for this model system. Previously, we established the value of Aplysia as a model of aging; these animals have approximately a one-year lifespan and exhibit a predictable decline in reflex behaviors with accompanying changes in function and gene expression in relevant neurons. A. californica also exhibit an extraordinary resistance to hypoxia and ischemia, which we are currently investigating as a model for understanding resistance to stroke, myocardial infarction and similar disorders. We have also shown that pre-exposure to hypoxia increases this resistance and that this preconditioning has a distinct transcriptional signature and is heritable, apparently via changes in methylation. We are also investigating a naturally occurring nidovirus infection in these animals which can play a major role in aging in the nervous system.

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Stable Isotope Laboratory

A. Saied, P.K. Swart

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The Stable Isotope laboratory (SIL) at the Rosenstiel School of Marine, Atmospheric and Earth Sciences (RSMAES) has seven instruments dedicated to the measurement of the stable isotopes of H, C, N, O, and S in most solid, fluid, and organic materials. Six of these instruments are mass spectrometers that ionize the gas of interest and accelerate the produced ions and then pass these through a magnetic field before being detected using Faraday cups. One of these instruments is a Cavity Ring Down Spectrometer (CRDS) that measures the absorption using a laser tuned to the specific vibration of a bond between two atoms. We use these instruments to study small variations in the abundances of the isotopes in a variety of systems in the fields of biology, geology, hydrology, climatology, and medicine. An example of one such application is the study of the stable C and N isotopic composition of humans. Variations in these isotopes are dependent upon diet. A person who consumes only plant material (i.e., no eggs, milk, or cheese) will have $\delta^{13}C$ and $\delta^{15}N$ values only slightly elevated compared to that of their diet. “You are what you eat, plus few per mille.” The slight elevation arises because during the bodies biochemical cycling, the light isotopes of C and N are preferentially eliminated, meaning that the remaining organic material is elevated. These values are recorded in fingernails and hair. In deceased individuals, bone material can be used. A strand of hair can record changes in diet as well as change in geographical location (in the $\delta^{18}O$ value). These approaches have been applied in studies of both living and long deceased individuals.

Virtual Tour of the Zebrafish Core Facility

R. Cepeda[1], J. Dallman[1,2]

[1]Zebrafish Core Facility, College of Arts and Science, University of Miami, Coral Gables, FL, USA;
[2]Department of Biology, College of Arts and Science, University of Miami, Coral Gables, FL, USA

This electronic poster will provide a virtual tour of the College of Arts and Science (CAS) Zebrafish Core Facility at the University of Miami (UM). The aim of this Facility is to provide UM and South Florida communities with zebrafish embryos, larvae and adult zebrafish for research and teaching. A single zebrafish female produces hundreds of embryos that develop externally and are transparent, making early developmental stages accessible to study. The development of both organ systems and behavioral repertoires are fast and stereotyped, and gene knock-down and transgenic technologies are inexpensive and rapid. These attributes have made zebrafish a popular choice for screens and cancer, physiology, regenerative medicine, neurological and developmental biology. The Zebrafish Core Facility houses 20 racks of recirculating Aquatic Habitat aquaria that can accommodate 20,000 adult zebrafish. Several experimentally useful lines of fish are hosted in the facility, and more can be acquired depending on users' needs.

Zebrafish Core Facility

R. Cepeda[1], J. Dallman[1,2]

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[2]Department of Biology, College of Arts and Science, University of Miami, Coral Gables, FL, USA

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Division of Veterinary Resources (DVR)

J. Zaias

Office for the Vice Provost for Research and Scholarship (OVPRS), University of Miami, Coral Gables, FL, USA; Department of Pathology and Laboratory Medicine, University of Miami Miller School of Medicine, Miami, FL, USA

The Division of Veterinary Resources (DVR) at the University of Miami supports research involving the use of animals. DVR's mission is to provide superior animal and clinical care, facilitate high quality research, teaching, and education, maintain regulatory compliance, and collaborate with our stakeholders/customers to enhance and advance institutional goals. We operate as a knowledgeable, professional, and responsive team, and promote a culture of trust, engagement, transparency, and respect. Our team of over 60 staff includes veterinarians, veterinary technicians, and animal care technicians and professionals. We provide research support through clinical care, treatments, surgical and anesthesia support, colony management, and medication and supply sales. The DVR team also provides study consultations, budgeting, and clinical and histopathologic support as needed. We work closely with other core facilities at the University.

Frost Institute for Data Science and Computing (IDSC) Advanced Computing Resources

N. Alberti[1], E. Maradzike[1], R. Vadapalli[1,2], J. Baringer[1], R. Pasupuleti[1]

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Frost Institute for Data Science and Computing (IDSC) services and resources are available to everyone: students, faculty, researchers, the public and private sector, nonprofits, industry, and beyond. This poster displays the numerous IDCS services, including software, storage, hosted machines, consultation, and grants. Our collaborative approach brings together talented minds at the interface of disciplines to harness the University of Miami's AI-ready TRITON and PEGASUS supercomputers. It also includes hardware specs for the new Pegasusdev testbed. As a member of the University of Miami's Frost Institutes of Science and Engineering, IDSC is focused on utilizing the extraordinary potential of data science to tackle society's greatest challenges. From creative student projects to innovative industry-shaping ideas, IDSC services and resources can help you achieve your research, training, or business goals.

Dosimetry Program at the University of Miami: Resources and Services

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Florida is recognized as an Agreement State by the United States Nuclear Regulatory Commission (NRC). This designation means that Florida has established an agreement with the NRC to regulate the use of radioactive materials within the state. The Florida Department of Health is responsible for overseeing the possession and use of these materials. The primary method for implementing regulations and ensuring safety in organizations is through the Radiation Safety Program. The Radiation Control Center (RCC) at the University of Miami, led by Dr. Amurao, who serves as the Radiation Safety Officer and Executive Director, is tasked with ensuring compliance with all federal, state, and local laws regarding the use of radioactive materials, as well as relevant machines and devices.

A dosimetry program is in place to monitor and record occupational radiation exposure through the use of radiation badges. This program ensures adherence to safety standards and follows the as low as reasonably achievable (ALARA) principle. Dosimeters, also known as badges, are small devices worn by individuals to measure and record their exposure to ionizing radiation, helping to ensure compliance with safety regulations and monitor potential health risks. Dosimeters are issued for either a one-month or three-month wear period, and at the end of each period, replacement dosimeters are provided through the designated badge coordinator.

This poster aims to illustrate the role of the Radiation Control Center in fulfilling the objectives of the resources and services offered by the Dosimetry Program. Additionally, it seeks to educate users about the proper use and timely exchange of dosimetry badges at the University of Miami.

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University of Miami Libraries

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[1]Louis Calder Memorial Library, University of Miami Libraries, University of Miami Miller School of Medicine, Miami, FL, USA; [2]Richter Library, University of Miami Libraries, University of Miami, Coral Gables, FL, USA

The mission of the University of Miami Libraries is to provide faculty, students, researchers, and staff with the highest quality access to collections, information services, learning and research collaboration, and digital expertise aligning with the University's mission to transform lives. The University Libraries welcomes and incorporates advances and innovations in information technology and scholarly communication to ensure that our users can locate and use global information resources in all formats. The University Libraries comprises six libraries across all three of the University's campuses in Coral Gables, on Virginia Key, and in the Health District near downtown Miami. Libraries on the Coral Gables campus include: the interdisciplinary Otto G. Richter Library; the Architecture Research Center at the School of Architecture; the Judi Prokop Newman Information Resource Center at the Herbert Business School; and the Marta and Austin Weeks Music Library at the Frost School of Music. The Roberto C. Goizueta Pavilion at the Richter Library is home to the Cuban Heritage Collection. Also in Richter, the Kislak Center at the University of Miami is home to Special Collections and University Archives. The Miller School of Medicine hosts the Louis Calder Memorial Library, and the Rosenstiel campus hosts the Rosenstiel School of Marine, Atmospheric, and Earth Science Library.