CORE UTILIZATION SUBSIDY PROGRAM

(formerly Research Voucher Program)

University of Louisville Center for Integrative Environmental Health Science (CIEHS)

Omics & Exposure Facility Core (OEFC)

READY TO GO CORE UTILIZATION SUBSIDY DUE DATE: January 3, 2024

Ready to go awards must be used prior to March 31, 2024

The **UofL Center for Integrative Environmental Health Science (CIEHS)** solicits applications to support integration of OMICS and exposure studies (e.g., next generation sequencing, proteomics, metabolomics, metallomics, and exposomics) into environmental health science (EHS) research programs. The OEFC Core Utilization Subsidy program is open to all UofL eligible faculty in science, technology, engineering, and math regardless of race, color, national origin, sex, disability, or age. **The Core Utilization Subsidy Program (CUSP) requires that the applicant utilize one or more of the CIEHS cores (CEC, TRSC, OEFC, BIFC). If biostatistics or bioinformatics are involved with the application, the CIEHS BIFC must be used. CIEHS members may be the principal investigator (PI) on only one active award from CIEHS during any given fiscal year.** Members who are PIs in a No Cost Extension (NCE) on a CIEHS award may apply for a new Core Utilization Subsidy during the NCE. It is expected that funding these EHS-centric studies will lead to Pilot Project Program or NIEHS grant submissions by the PI.

Background: The goal of the CIEHS is to develop a framework to understand the complexities of and to integrate the interactions between environmental toxicants, lifestyle factors, structural determinants of health, life stage, genetics and gender/sex and their roles in human health and disease. The CIEHS facilitates research and training focused on: (**1**) exposure to industrial chemicals present in the urban and rural Kentucky environments (metals, volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs), vinyl chloride, etc.), (**2**) lifestyle factors (diet, alcohol, socioeconomic stressors, obesity, etc.), structural determinants of health, and the modifications to response by life stage, genetics, and gender/sex in development of chronic adult diseases. The CIEHS is organized into three multi-disciplinary research interest groups (Environmental Justice, Health Disparities and Climate Change & Health, Mechanistic and Translational Toxicology, and Precision Environmental Health and Exposome); a Translational Research Support Core (TRSC), a Community Engagement Core (CEC), and two facility cores (biostatistics and informatics, "BIFC"; and OEFC).

OEFC CUSP applications will be accepted for this deadline. **Priority for the January 2024 deadline is being given to proposals focusing on the following areas: *A. Precision Environmental Health/Exposome, B. Mechanistic and Translational Toxicology or C. Environmental Justice, Health Disparities, and Climate Change Health).* *Due to limited funding, the awards will be prioritized first to support target area funding.***

1. **Precision Environmental Health/Exposome:**
    - Addresses the individual variability associated with responses to environmental exposures
    - Goal is to understand individual risk to prevent disease
    - Integrates Genetics, Epigenetics and Omics Data
    - Exposomics: measurements of multiple exposures and/or the health effects of multiple exposures
2. **Mechanistic and Translational Toxicology:**
    - Molecular mechanisms that underlie agent toxicity: how is gene expression impacted by exposures
    - Data generation can be translated to human biology
    - Utilizes innovative new approaches to study environmental exposures
3. **Environmental Justice, Health Disparities and Climate Change & Health:**

- Environmental factors such as air and water quality are fundamental determinants of our health and well-being. Environmental factors can lead to disease and health disparities when the places where people live, work, learn, and play are burdened by social inequities.
- Climate Change Direct Effects: heat-related illness; respiratory disease; heart disease; food- water-and vector-borne diseases; injury; premature death, mental health impacts, poor maternal and birth outcomes
- Climate Change Indirect Effects: chemical releases into environment, changes in air, water, food quality and quantity; population displacement; interruptions to health care; Infrastructure and supply chain disruption; economic impacts – more people living in poverty.

General Information and Types of Awards:

(1) **Response to Reviewers** (**small) awards** for up to $1,500 to cover the costs associated with OMICs research needed to finish out a project or address questions arising in manuscript revisions or grant resubmissions.

(2) **New Hypothesis Expansion/Direction (medium) awards** for up to $5,000 to cover costs associated with critical exploratory research and proof-of-concept studies needed by CIEHS members for hypothesis generation and grant submission.

(3) **Supporting the Base (large) awards** (up to 25% total OMICS costs capped at a $10,000 maximum) will be provided to subsidize CIEHS-member NIEHS-funded research.

Review Process: Applications are submitted through the Onbase platform and then reviewed by the CUSP Review Panel (Drs. Merchant, Leblanc, and Cave) which makes funding recommendations to the CIEHS EC. **Note: Awards for human studies or animal studies will not be approved if IRB or IACUC protocols are pending.**

An individual may be the PI on only one active award from CIEHS in any fiscal year. Members who are PIs in a No Cost Extension (NCE) on a CIEHS award may apply for a new CUSP award during the NCE. **Awardees** will be required to sign an award notice committing to the terms of the award, including CIEHS membership, required post-award reporting, citation of the grant (P30ES030283) in any publications, and **participation in a CIEHS session at the subsequent annual Research!Louisville event**.

Post-Award Administration of Core Utilization Subsidy Awards

Reporting: Ascertaining the impact of OEFC CUSP awards on UofL EHS research is vital for gauging the success of the program. To gather necessary information needed to measure success all awardees (PIs) will be contacted 12-, 24- and 36-months post award. The goal will be to determine if and how the OEFC funds led to support and stimulation of EHS research by CIEHS members. We will be looking to gather information that includes but is not limited to: **(a)** listing of poster and oral presentations, **(b)** grant applications which included subsidized research results, **(c)** trainees that were directly involved with the research, **(d)** copies of the manuscripts (resubmitted/in-press/published), **(e)** grant applications (submitted/funded/renewed), **(f)** data sharing to the EHS research community and lastly a cover page addressing how the expended funds addressed the gap in the research.

To apply for a CUSP award**, please click on the link below:**
https://louisville.edu/ciehs/ciehs-research-vouchers/ciehs-research-voucher-application

Program Contacts

For general information about the CIEHS OEFC Subsidy Award Program and the application process, contact: Michael Merchant, PhD, Director, OEFC; oefc@louisville.edu / 502-852-0425

For information related to Shared Resource Core Facility Directors and Advisors, contact the following individuals:

Shared Resource Director	Resource Director – UL Building & Office#	Performance Site – UL Building & Office #
Genomics	Melissa Smith, PhD 502-852-7495 ml.smith@louisville.edu	Office: Delia Baxter Research Building Lab: Delia Baxter Research Building Rooms 227E-H
Metagenomics	Venkatakrishna Jala, PhD 502-852- 5523 venkatakrishna.jala@louisville.edurachel.neal@louisville.edu	Office: CTRB, Room 323 Lab: CTRB, Room 327A
Proteomics	Michael Merchant, PhD 502-852-0245 michael.merchant@louisville.edu	Office: Donald Baxter Research Building, Room 204C Lab: Donald Baxter Research Building, Rooms 207/209/215
Metabolomics	Xiang Zhang, PhD 502-852-8878 xiang.zhang@louisville.edu	Office: Shumaker Research Building Room 349 Lab: Shumaker Research Building, Room 335
Environmental Metals	Lu Cai, MD, PhD 502-852-2214 lu.cai@louisville.edu	Office: Donald Baxter Research Building, Room 314F Lab: Donald Baxter Research Building, Rooms 309,311,319
Murine Exposure Assessment and Phenotyping	Daniel J. Conklin, PhD 502-852-5836 daniel.conlin@louisville.edu	Office: Delia Baxter Building, Diabetes and Obesity Center (DOC) Room 404E Animal Phenotyping Laboratories: Delia Baxter Building, Rooms 411, 419, 420, 434 (UofL Inhalation Facility labs)- Medical Dental Research Building rooms: 715, 716, 717, 722

For information related to P30 Center cores, contact the individual core directors:

- Translational Research Support Core (TRSC), Matthew Cave, MD (ihsfc@louisville.edu)
- Community Engagement Core (CEC), Luz Huntington-Moskos, PhD, RN, CPN (luz.huntingtonmoskos@louisville.edu)
- Biostatistics and Informatics Facility Core (BIFC), Juw Won Park, PhD and Maiying Kong, Ph.D. (bifc@louisville.edu)

OEFC Shared Facility Resources and Fee Schedules

Genomics

(Billing varies by approach and sample or replicate numbers. Please contact core (http://louisville.edu/research/kbrin/kbrin-cores/genomics-core).)

Service Category	Application and methods		
1) Next Generation Sequencing Service	Illumina MiSeq, Illumina NextSeq		
2) Single-Cell Sequencing Services	10X Chromium Controller		
3) Real-time quantitative PCR (qPCR)	ViiA7: 96-well FAST, 384-well, and Array Card block)		
4) Sample preparation and training- RNA analysis, PCR, ultrasonication,	Nanodrop One and ABI Qubit	Covaris S220	BioAnalyzer
5) Data mining	Metacore, Partek		

Metagenomics- Functional Microbiomics Core (FMC)

Service Category	Fee structure
1) Germ-Free Mice	C57BL/6 ($80/mouse; $3/cage/day)
2) Nanopore Sequencing and 16S Analysis	$30/sample; requires 24 samples ($720) to use single Flongle flow cell
3) Multiplex Analysis by Luminex xMAP technology	Bioplex-200 immunoassay using serum, plasma, cell culture supernatants, lysates, and other sample types- prices kit dependent ranging between 1,500 to 8,000.

Proteomics

1D-LCMS		Cost per	Additional reagents
1) Validation of knowns	Purified peptide or protein	$75	
2) Discovery proteomics	Gel bands	$125	
	Complex samples	$175	
3) *Absolute quantification	*AQUA or *PRM/MRM-Tof	$125	Stable isotope labeled standards
4) *Post-translational modifications	*Phosphoproteomics	$175	Phosphopeptide enrichment kits
	*Other PTMs	$175-$1,375	Project specific
2D-LCMS			
5) Discovery proteomics	Label-free Moderate complexity	$1,375	
	Label-free High complexity	$2,875	
	*TMT-labeling	Varies	Multiplexing TMT reagents
6) Bioinformatics			
Basic studies	Volcano plots, GO analysis	$75/hour	
Advanced studies	Pathways analysis, protein-protein interaction analysis, target selection	N/A	
*Requires consultation and development			

Metabolomics

Service Category		LCxLC-MS	GC-MS	GCxGC-MS	LC-MS	Bioinformatics
Units		Sample	Sample	Sample	Sample	Hour
Billing Rate per UNITS		$200.00	$100.00	$170.00	$100.00	$70.00
1) Untargeted polar metabolite profiling by GCxGC-MS and LCxLC-MS						
2) Untargeted lipid profiling by LCxLC-MS						
3) Targeted metabolomics by LC-MS via MRM						
4) Targeted metabolomics for short chain fatty acid by GC-MS						
5) Quantification of bile acids by SPE LC-MS						
6) Quantification of nucleosides and nucleotides by SPE LC-MS						

Environmental Metals

Total metal analysis:	Fee Structure
1) Inductively-coupled plasma – mass spectrometry (ICP-MS)	$45/sample*
* - May be eligible for subsidy; contact the Core Director for more information	

Animal Phenotyping Core and the Functional Inhalation Core

(Billing varies by approach and sample or replicate numbers. Please contact Facility Core Director Dr. Daniel Conklin (dj.conklin@louisville.edu): http://louisville.edu/doc/research-core/animal-phenotyping-core-prices)

Use of Inhalation Facility requires consultation with Core Director, Dr. Conklin			
Service Category		Fees: Assisted (per test subject)	Fees: Unassisted (per test subject)
1) Hind Limb Ischemia Surgery		$60.29	NA
2) Hind Limb Ischemia Surgery w/ Laser Doppler Imaging		$71.21	NA
3) Glucose Stimulated Insulin Secretion (GSIS)		$249.05	NA
4) Telemetry Surgery (surgery costs only; transmitters need to be purchased separately)			
	a) Temperature and Activity	$57.16	NA
	b) Respiratory Rate	$76.81	NA
	c) Blood Glucose (HD-XG)	$96.46	NA
	d) ElectroCardioGram (ECG)	$57.16	NA
	e) Blood Glucose	$76.81	NA
	f) BP+ECG (HD-X11)	$96.46	NA
5) DexaScan Imaging		$26.46	$16.64
6) Metabolic Chambers		$65.15	NA
7) Non-invasive Blood Pressure		$62.90	$1.97
8) Glucose Tolerance Test – Insulin TT – Pyruvate TT		$20.68	NA
9) Euthanasia		$10.63	NA
10) Blood Draw		$11.31	NA
11) Blood Draw with Dissection		$14.59	NA
12) Injections/Drug Dosing		$10.73	NA
13) Blood Gas Measurements		$11.74	$1.91
14) Core Technical Staff Time		$39.30 per hour	
NA, not available			
Unassisted use of any equipment requires consultation with Core Director			