REQUEST FOR APPLICATIONS
UofL CIEHS INTEGRATED TOXICOMICS ENVIRONMENTAL MEASUREMENT FACILITY CORE RESEARCH VOUCHER PROGRAM

Due Dates

Award type (up to)	Submissions	Awards	Year 1 Expenditure Completion
Large voucher*‡ ($10,000)	**Cycle 1**- Round #2 **September 25, 2020**	Large voucher 1st Friday of the month	3/31/2021
Medium voucher*‡ ($5,000)	**Cycle 2**- 2nd Friday in **January**	Medium voucher 1st Friday of the month	3/31/2021
Small voucher*‡ ($1,500)	**Cycle 3**- 2nd Friday in **May**	Small voucher 1st Friday of the month	3/31/2021
* Awards are contingent upon availability of funds. Depending on the numbers of meritorious applications the funding for later submission due dates may be canceled due to lack of funds. ‡ITEMFC Voucher Program will consider off-cycle applications for emergent situations such as disaster response research. Please contact ITEMFC Director (michael.merchant@louisville.edu) directly.			

The UofL Center for Integrative Environmental Health Science (CIEHS) is soliciting 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 through the recently obtained CIEHS P30 Environmental Health Sciences Core Center grant. All investigators with current environmental health research topics are invited to apply for RESEARCH-VOUCHER subsidies addressing small (up to $1,500), medium (up to $5,000) or large (up to $10,000) projects. Applicants from members of all traditionally underrepresented groups in science, technology, engineering, and math are encouraged to apply.

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, life stage, genetics and gender 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, VOCs, PCBs, vinyl chloride, etc.), (2) lifestyle factors (diet, alcohol, socioeconomic stressors, obesity, etc.), and the modifications to response by life stage, genetics and gender in development of chronic adult diseases. The CIEHS is organized into three multi-disciplinary research interest groups (multi-organ toxicology, cancer, and neurodevelopmental toxicology); an Integrated Health Science Facility Core (IHSFC), a Community Engagement Core (CEC), and two facility cores (biostatistics and informatics; and integrated toxicomics and environmental measurements, "ITEMFC").

Goal for this RFA: The goal of this RFA is to provide financial support of the integration of available shared omics resources into EHS research. This support is targeted to the shared research cores and will be in the form of ITEMFC research vouchers that maybe be invoiced by the respective shared resource facility core.

General Information and Types of Awards: This RFA solicits applications for three types of subsidy awards- (1) **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) **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 (re-)submission. (3) **Large awards** (up to 25% total OMICS costs capped at a $10,000 maximum) will be provided to subsidize CIEHS-member NIEHS-funded research.

The second round due date for award applications in response to this RFA is **Friday September 25, 2020 no later than 5PM (CST)**. Applications will be reviewed, and awards made as soon as possible with anticipated start date of

10/02/2020. The project period will be for five months after date of award. Expenditure of the subsidy grant vouchers must be completed by **03/31/2021**.

Awardees will be required to sign an award notice committing to the terms of the award, including required post-award reporting, citation of the grant (P30ES030283) in any publications, and participation in a CIEHS session at Research!Louisville 2021.

Submission instructions: All submissions require completion and submission of the "ITEMFC RESEARCH VOUCHER PROGRAM APPLICATION COVER PAGES". *Please email final applications as* ***a single PDF file*** *to* ***Ms. Colleen Quinter (colleen.quinter@louisville.edu)*** *and carbon copy* ***Michael Merchant (michael.merchant@louisville.edu).***

Voucher award applications: Initiation for a voucher award application should be through contact with a facility director to determine research feasibility, timeline, and budget. **Small, medium,** and **large award** voucher applications require a completed cover pages provided with this award announcement (no institutional signature needed). Small and medium voucher applications should provide additional information including: an abstract stating the project's broad, long-term objectives and specific aims, referring to the relevance to the mission of the NIEHS. Describe the research design and methods for achieving the stated goals. Be sure that the project summary reflects the key focus of the proposed project so that the application can be appropriately categorized. **Small award** applications need to provide (a) a copy of the editorial & reviewers comments and (b) a statement of how the support will address manuscript/grant reviewer comments. **Medium award** voucher applications require an expanded research abstract (2 pages maximum) that includes study title and objective as it relates to environmental health, basic experimental design including the type of project, sample background (species), type of omics study utilized. **Medium award** applications need to provide (A) a statement of how new information gained will be used to support a current NIEHS research project or translation into a new NIEHS research project, and (B) a letter from the Biostatistics and Informatics Facility Core supporting the proposed data analysis plan. **Small and Medium awards**- Please provide copies of manuscript or grant applications with reviewer comments if support is used to move the project to maturity. Provide limited bibliography for references cited. A letter from the omics core facility director or staff addressing feasibility and estimated costs is a requirement. Please provide PI biosketch and if necessary, IRB/IACUC approvals in NIH formatted attachments as well.

Large voucher awards applications require the following.

Submission Instructions: Please submit large voucher award applications using the cover page provided with this announcement, an abstract that includes study title, the specific aims page of the funded NIEHS grant, and one page addressing relevance of proposed omics research to the grants goals and objectives. Bibliography and References Cited, Proposed Shared Facility Core budget, Biosketch of PI/MPI, and IRB/IACUC approvals in NIH formatted attachments as well.

Bibliography and References Cited- No defined page limit.

Small/Medium/Large Award Budgets- Provided budget information should include projected subsidized costs based on the shared resource facility fees. Large voucher awards will contribute up to 25% of an OMICs study and is capped at $10,000. Please provide the award or speed type for source of the matching 75% study budget. All award vouchers will be disbursed directly to the respective core upon submission of invoiced services up to the amount award. Applicants must consult with shared resource core directors and or advisors (see contact list at end of document) during the application process to discuss capabilities and develop the costs. These budget projections by the shared research facility must be provided in the form of a letter of support by the facility core.

Biosketch- Provide NIH-style biosketch (https://grants.nih.gov/grants/forms/biosketch.htm) for all PI/multiple PI (MPI) applicants and for large awards any key personnel involved in the study.

Letters of Support- Letters of support should be included from the shared resource core director to indicate discussion of experimental feasibility, expected results, and estimated timeline for study completion. For medium and large awards letters of support should be provided by the biostatistics and informatics core.

Human or Animal Subjects- For all Omics research to be conducted on animals, human subjects, or biological samples related to same, please submit as NIH formatted attachments for appropriate IRB approval notices and human subjects protection sections; and IACUC approval and vertebrate animal protection sections.

Review Process: All applications will be reviewed by an ITEMFC director and CIEHS executive staff to evaluate for (A) addressing the CIEHS goals and advancing the NIEHS mission, (B) scientific merit, and (C) feasibility of achieving stated aims and goals. Medium award voucher applications will be assigned to two independent, expert-reviewers to focus on review of scientific merit and will be scored for scientific merit on the 9-point NIH rating scale to rank for funding and provide feedback to the applicant.

An individual may be the PI or co-investigator on only one award from CIEHS in any fiscal year. Productivity (manuscripts, grant applications & funding) using data generated by award funding must be documented in a progress report.

Post-Award Administration of Voucher Awards

Reporting- Understanding the impact of ITEMFC voucher awards is important to guiding future subsidy opportunities as well as understanding core utilization and impact of the subsidized research. The information gathered in this way will be used to measure success of the program, which will be necessary for a renewal of the P30 center.

Small, medium, and large voucher awardees will be required to a submit progress reports addressing (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) a 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. Award reporting is commensurate with the award voucher: (1) small voucher award- 12-month report, (2) medium voucher award- annual 12- and 24-month reports; and large voucher award- annual 12-, 24-, and 36-month Failure to provide these reports will invalidate future voucher submissions by the PI.

Research!Louisville Symposium- ITEMF Subsidy awardees agree to participate in a CIEHS symposium as part of Research!Louisville.

Strategies for New Grant Funding- A central goal of the ITEMFC Subsidy Award will be to facilitate and enable integration of OMICS research into current environmental health research at UofL. It is expected that the OMICS research subsidized will be used to expanded current research efforts and will support one or more components of proposal(s) for external funding to continue the project. Subsidy awardees will be encouraged to interact with the ITEMFC directors for mentoring and advancement of omics data and available technologies and facilitate procurement of new external funding. The CIEHS will provide assistance with identification of collaborators, continued and expanded use of core facilities, and pre-submission internal grant review.

Program Contacts

For general information about the CIEHS ITEMFC Subsidy Award Program and the application process, contact: Michael Merchant, PhD, Director, ITEMFC; Michael.Merchant@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	Wolfgang Zacharias, PhD 502-852-2579 wolfgang.zacharias@louisville.edu	Office: Center for Translational Research Building, Room 218 Lab: Center for Translational Research Building, CTRB Rooms 227E-H
Metagenomics	Rachel Neal, PhD 502-852-3179 rachel.neal@louisville.edu	Office: Medical Dental Research Building, Rooms208 Lab: Medical Dental Research Building, Room 209
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
Exposure assessment	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:

Integrated Health Science Facility Core (IHSFC)
Matthew Cave, MD
m0cave01@louisville.edu

Community Engagement Core (CEC)
Luz Huntington-Moskos, PhD, RN, CPN
luz.huntingtonmoskos@louisville.edu

Biostatistics and Informatics Facility Core (BIFC)
Shesh Rai, PhD
shesh.rai@louisville.edu

ITEMFC 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 samples types- prices kit dependent ranging between 1,500 to 8,000.

Proteomics

1D-LCMS	Sample type	Cost per sample	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			

CIEHS ITEMFC RESEARCH VOUCHER PROGRAM APPLICATION COVER PAGES

1. Title of Project:

2. Principal Investigator (list the name of the one person responsible for the scientific and ethical conduct of the project):

2(a) Academic Rank/Position Title:

2(b). Department of Primary Appointment:

2(c) Telephone number:

2(d) Email address:

3. Collaborator(s):

4. Dates of Project (indicate beginning and ending dates for the project):

5. Performance Sites (list site(s), building and rooms, where the work will be performed):

6. Budget (indicate the total amount requested):

7. Compliance and Training: Please complete the following table to address status of compliance and training of personnel involved in the research.

	Yes	No	Internal Review/ Registration No.	Status (approved, submitted, pending)
a. Human subjects?			IRB	
b. Experimental animals?			IACUC	
c. Ionizing radiation devices/isotopes?				
d. Recombinant DNA?				
e. Pathogenic organisms?				
f. CDC/USDA Select Agents?				
g. Human blood, tissue, cell lines. OPIM?				
h. Highly toxic, carcinogenic, mutagenic agents?				

Note: The P.I. is responsible for complying with University safety rules, policies and procedures.

10. Award Type: Small ☐ Medium ☐ Large ☐

11. Research Interest Group (RIG): Indicate the RIG(s) by checking the appropriate choice(s).
(Check all that apply.)

☐ Cancer

☐ Multi-Organ Toxicology

☐ Neurodevelopmental Toxicology

☐ None

SIGNATURES:

Principal Investigator:_____Date: _____

The Principal Investigator certifies that this is a new project which is not being considered for other intramural funding. The undersigned agrees to accept responsibility for the scientific and ethical conduct of the project.