

MEMORANDUM OF UNDERSTANDING AMONG ACADEMIC RESEARCH INSTITUTIONS REGARDING RECIPROCAL ACCESS TO SHARED RESOURCES

BACKGROUND

This Memorandum of Understanding ("MOU") is entered into by and between the seven undersigned academic research institutions: Virginia Commonwealth University, College of William & Mary, George Mason University, University of Virginia, Eastern Virginia Medical School, Old Dominion University, and Virginia Polytechnic Institute and State University (individually an "Institution" and collectively, the "Institutions"). The Institutions have been encouraged by the Virginia Biosciences Health Research Corporation ("VBHRC") to consider ways to enhance collaboration, cooperation and interaction between institutions of higher education within the Commonwealth of Virginia in a manner that effectively and efficiently uses existing resources at each Institution. The Institutions believe that such collaboration will be facilitated by execution of this MOU.

The Institutions have individually made significant investments to acquire specialized equipment and establish unique research cores supporting basic and clinical research. To further enhance the availability of these existing resources, the Institutions seek to share, in an economical manner, specialized technical services and access to equipment and expertise for research purposes.

This MOU sets forth the understanding of the Institutions concerning reciprocal access to shared resources. The purpose of the MOU is to document (a) the intent of each Institution to provide reasonable access, as capacity will permit, to its specifically identified shared resources and (b) the policies and conditions governing such access. For purposes of this MOU, "Shared Resources" means the research equipment and expertise, cores, facilities and/or services specifically identified by an Institution that shall be made available to the other Institutions pursuant to this MOU.

I. General Understanding:

- A. The Institutions shall cooperate in good faith to encourage access to each Institution's respective Shared Resources, for research purposes. Pursuant to the MOU, an Institution may designate investigators as those faculty members of an Institution who seek to use Shared Resources in support of research ("Investigators").
 - 1. Each Investigator must be a member of the faculty, or under the direct supervision of such a faculty member, at his/her respective

Institution. Each Institution is encouraged to send to the other Institutions quarterly updated lists of its Investigators and available Shared Resources. Each Institution shall appoint a Shared Resource Director who will serve as an Institutional point of contact for requests to use Shared Resources.

2. Investigators desiring to use a Shared Resource at another Institution must first contact the appropriate Shared Resource Director at the other Institution to confirm availability of access and learn of any specific policies governing access. Once this is done, the point of contact at both Institutions should be notified that samples and/or data will be sent and to arrange for billing information to be provided.
 3. Fees charged to an Institution by another Institution shall equal the fees charged to the Investigators at their own Institution for internally funded activity. Further, the fees charged shall not include, and shall be in addition to, any expense properly allocated by the providing Institution as an indirect cost on Subawards or Subcontracts, in accordance with the providing Institution's indirect cost rate agreement.
 4. Each Institution shall invoice for use of a Shared Resource as requested by each Investigator, with the requesting Investigator providing appropriate billing information to the Investigator before the Shared Resource is provided, as set forth in this MOU.
 5. The Institutions shall review performance under this MOU biannually, and based on such review shall propose appropriate amendments to the MOU, including but not limited to soliciting other higher education institutions within the Commonwealth of Virginia to become signatories to this MOU. Any amendments to this MOU shall be binding as to an Institution only upon the execution of such amendment by a duly authorized signatory of the Institution.
- B. Each Institution shall give priority for use of Shared Resources to Investigators at their home Institution. An Investigator at an Institution wishing to use a Shared Resource at another Institution may do so on an 'as available' basis. Investigators shall have priority for Shared Resource access at their home Institution. As availability permits, Investigators shall have access to the Shared Resources of other Institutions. In special recognition of the frequently irreplaceable nature of samples

housed within a Shared Resource primarily concerned with acquisition and distribution of clinical tissue samples (i.e., a biorepository), access to tissue samples from an Institution will require a determination by the respective scientific director of such resources at such Institution that granting access will not disruptively impact the potential future needs of investigators at the home Institution.

- C. This MOU extends to the Shared Resources at the respective Institutions as indicated on Exhibit B.

II. Term; Renewal; Termination

- A. This MOU shall be effective as of June 22, 2017 (the "Effective Date"), and shall remain in full force and effect until the 5th anniversary of the Effective Date, unless terminated earlier in accordance with this MOU. Unless terminated earlier, this MOU shall automatically renew for additional five year terms.
- B. An Institution may terminate this MOU at will solely with respect to such Institution by providing 60 days advance written notice to the other Institutions.

III. Administration:

- A. Investigators who seek to use a Shared Resource shall contact the specific Shared Resource Director and the Administrator at their home Institution as set forth on Exhibit A attached hereto. Before services are provided, the ordering Institution will provide order information to the supplying Institution. The point of contact at the supplying Institution will be responsible for submitting an invoice for payment for services provided to Investigators and for providing copies of the invoices to the point of contact at the ordering Institution. Shared Resource Directors will keep a log of all reciprocal users. Shared Resource Directors will submit a monthly report to the Shared Resource Directors who oversee all Shared Resources at their respective Institutions.
- B. Each Institution will have an oversight committee to review usage capacity. If an Institution determines, in its sole discretion, that another Institution is making excessive use of Shared Resources, that Institution shall notify the relevant Administrator and the two Institutions shall work

in good faith to reach an understanding about future usage of Shared Resources. Such understanding may include a temporary or permanent moratorium on such usage of Shared Resources. If the relevant Institutions cannot reach an understanding, the Institution providing the Shared Resources may terminate this MOU with respect to the relevant Institution only, and/or with respect to specific Shared Resources. Such termination of access rights shall be made in a writing delivered to the Administrator of the Institution being denied access rights.

- C. Investigators from the Institutions will be invited to attend annual Shared Resource Retreats to be held at times and locations to be mutually agreed upon by the Institutions.

IV. Intellectual Property:

- A. Except in making the Shared Resources known to faculty, no Institution may use the other Institutions' names, logos or marks, or any derivative thereof, without the prior written permission of the Institution whose name, logo or marks, or derivative thereof, are proposed to be used.
- B. Ownership and other rights in and to intellectual property of the Institutions shall not be affected by this MOU. The Institutions intend for ownership of intellectual property rights to vest in the employer of the individual inventors and/or authors according to the intellectual property policy of the Investigator's institution. Unless otherwise agreed to in a writing signed by duly authorized representatives of an Institution, mere usage of a Shared Resources shall not entitle the provider of the Shared Resource to any ownership or usage rights of intellectual property belonging to another Institution.
- C. All right, title and interest in and to any data generated by the provider of the Shared Resources in performance of work for another Institution shall vest exclusively in the Institution paying for or receiving such Shared Resources (the "Requesting Institution"). Unless otherwise expressly agreed to by the Requesting Institution, any data generated by the provider of the Shared Resources as a result of performing work for the Requesting Institution shall not be retained by the provider Institution, but shall instead either be sent to the Requesting Institution or destroyed per the instructions of the Requesting Institution.

V. Liability and Insurance:

- A. No Institution is, by virtue of this MOU, the agent of any of the other parties to this MOU, and no Institution shall be liable for the wrongful acts or negligence of the other parties to this MOU. Each Institution understands that use of the other Institutions' Shared Resources may involve exposure to potentially hazardous conditions.

- B. IN NO EVENT SHALL ANY PARTY TO THIS MOU BE LIABLE TO ANOTHER PARTY HERETO FOR INCIDENTAL, SPECIAL, INDIRECT, LOST PROFITS, LOST REVENUE, LOST OPPORTUNITY OR CONSEQUENTIAL LOSS, DAMAGE OR EXPENSE ARISING FROM OR IN RELATION TO THIS MOU.

VI. Confidentiality:

- A. Each Institution agrees not to disclose, except as required by law, to any third party or to use, directly or indirectly, for a period of five years after disclosure, any proprietary and confidential research data or other similar information of which the Institution may become aware as a result of using Shared Resources of the other Institutions, or as a result of having other institutions use its Shared Resources. For the avoidance of doubt, such information shall be marked "confidential" and "proprietary" at the time of disclosure.

- B. Notwithstanding the preceding provision, the obligations of the Institution receiving confidential information (the "Receiving Institution") from another Institution do not include: (i) information that, at the time of disclosure, was published, known publicly, or otherwise in the public domain; (ii) information that, after disclosure, is published, becomes known publicly, or otherwise becomes part of the public domain through no fault of the Receiving Institution; (iii) information that, prior to the time of disclosure, is known to the Receiving Institution as evidenced by its written records and is not then subject to an obligation of confidentiality to any third party; or (iv) information that, after disclosure, is made available to the Receiving Institution in good faith by a third party under no obligation of confidentiality and without restriction on its further disclosure by the Receiving Institution.

VII. Conduct Compliance:

- A. Each Institution shall require all employees, agents and students (if applicable) who use Shared Resources provided under this MOU to observe all applicable policies, rules and regulations of the Institution providing the Shared Resources.
- B. Each Institution shall comply with all applicable laws and legal requirements in connection with the activities contemplated by this MOU.
- C. This MOU shall be governed in all respects by the laws of the Commonwealth of Virginia without regard to its rules regarding conflict of laws. Any action to enforce the obligations of this Agreement shall be brought and maintained exclusively in the state courts of the Commonwealth of Virginia.

[Signature Page Follows]

VIRGINIA COMMONWEALTH UNIVERSITY

[NAME]

COLLEGE OF WILLIAM AND MARY

[NAME]

GEORGE MASON UNIVERSITY

[NAME]

UNIVERSITY OF VIRGINIA



Dr. Phillip A. Parrish, Interim Vice President for Research



Robert Merhige
AVP for Commercialization

EASTERN VIRGINIA MEDICAL SCHOOL

[NAME]

OLD DOMINION UNIVERSITY

[NAME]

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

[NAME]

EXHIBIT A

Shared Resource Directors for University of Virginia:

Jay W. Fox, Ph.D.; Professor of Microbiology, Immunology and Cancer Biology and Director of Shared Resources

EXHIBIT B

SHARED RESOURCES AVAILABLE AT University of Virginia

University of Virginia (<https://med.virginia.edu/core-facilities/cores-2/>)

Advanced Microscopy Facility
Antibody Engineering and Technology Core
Bioinformatics Core
Biomolecular Analysis Facility
BioNMR Facility
Biorepository and Tissue Research Facility
Exercise Physiology Core
DNA Sciences Core
Flow Cytometry Core
Genetically Engineered Murine Model Core
Molecular Electron Microscopy Core
Molecular Imaging and Radiochemistry Core
Research Histology Core
Stem Cell Core
Tissue Culture Facility

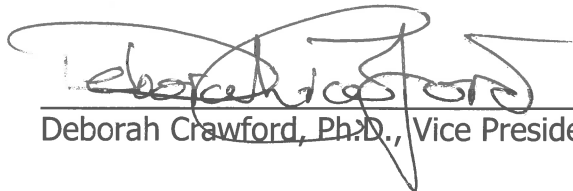
VIRGINIA COMMONWEALTH UNIVERSITY

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GEORGE MASON UNIVERSITY



Deborah Crawford, Ph.D., Vice President for Research

UNIVERSITY OF VIRGINIA

[NAME]

EASTERN VIRGINIA MEDICAL SCHOOL

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OLD DOMINION UNIVERSITY

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VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

[NAME]

EXHIBIT A

Shared Resource Directors for each Institution:

GEORGE MASON UNIVERSITY

Michael Laskofski, Associate Vice President of Research Operations

George Mason University

Office of Sponsored Programs

4400 University Drive, MSN: 4C6

Fairfax, Virginia 22030

Phone: (703) 993-4573

Email: mlaskofs@gmu.edu

EXHIBIT B
SHARED RESOURCES AVAILABLE AT EACH INSTITUTION

GEORGE MASON UNIVERSITY

Core Laboratories at George Mason University

ANIMAL CARE AND USE:

George Mason University manages two state-of-the-art vivarium facilities that have capacity for rodents through primates up to BSL-3, one on the Fairfax Campus and one of the Science and Tech Campus. The contact for these core facilities is David Myers; Animal Care Program Manager, Research Development, Integrity, and Assurance; iacuc@gmu.edu; 703-993-6118; <http://oria.gmu.edu/research-with-humans-or-animals/animal-care-and-use/>

RESEARCH COMPUTING:

The Office of Research Computing offers the following on-campus research computation options are:

- The ARGO cluster which has been installed in the Aquia Data Center for large scale computation needs of researchers in the university.
- Requesting a virtual computer for research from ITU. This is for research related computations that cannot be done on university researchers' desktops or laptops.

The contact for these resources is: Jayshree Sarma; Interim Director of Research Computing; jsarma@gmu.edu; 703-993-4397; <http://orc.gmu.edu/>.

MICROSCOPY:

There are two confocals--one upright, one inverted a Zeiss AxioObserver with AxioCam and a Nikon C1si D-eclipse. Also, an Olympus/Provis with Neruolucida software. The contact for these resources is: Nadine Kabbani, Assistant Professor, Molecular Neuroscience, 703-993-4406 or nkabbani@gmu.edu.

MAGNETIC RESONANCE IMAGING:

The **Mason 3T MRI Facility** houses a Siemens Prisma 3T Magnetom for human brain and whole body MRI. This facility is equipped with 32 channel phased array head coil, 16 channel shoulder coil, and multiple other head/neck/ spine, body, and flex coils. Applications include sequences for neuro, angio, cardiac, body, onco, breast, ortho, 2D and 3D ASL, SWI, and spectroscopy imaging. A 64 channel, MR compatible EEG system is also available. Visual displays include an Eiki projector. An ARRT certified MR Technologist is available for scanner operation.

Contact:

James Thompson
Department of Psychology
jthompsz@gmu.edu
(703)993-9356

PROTEOMICS:

Center for Applied Proteomics and Molecular Medicine Laboratory

The Protein Microarray and Molecular Characterization Laboratory houses Aushon 2470 Automated, High-Throughput Protein Arrayers and Dako robotic autostainers utilized to generate protein arrays for analysis of tissue and cellular samples for biomarker discovery. The **Molecular Characterization Laboratory** is equipped with an Illumina Bead Array Reader for high density DNA single nucleotide polymorphism (SNP) analysis. The SNP analysis is used to assess genomic copy number variation and can be used to create a molecular karyotype.

The **Tissue Processing and Imaging Laboratory** is equipped with histology equipment to embed and cut paraffin and frozen tissue sections with a Tissue Tek VIP Tissue Processor, Thermo microtome MH325, Harvard Apparatus vibratome, and Leica CM1850UV cryostat. Five laser capture microdissection systems in the laboratory are used to isolate enriched cell populations under direct microscopic visualization (2 Arcturus XT Automated Laser Capture Microdissection Systems, and 3 Arcturus PixCell II/IIe Laser Capture Microdissection Systems). A cytospin centrifuge and RoboSep magnetic cell sorting instrument are also available for processing biological fluids.

Imaging capabilities include an Olympus BX51 microscope outfitted with a digital camera, phase contrast and fluorescence, as well as an Olympus BX51 dual head, light microscope with a digital camera.

The Mass Spectrometry Laboratory uses specialized chromatography, electrophoresis, and cell fractionation systems, combined with high-performance mass spectrometers (Orbitrap Fusion, LTQ-Orbitrap, Triple Quadrupole, and MALDI- TOF-TOF), to separate and analyze components of tissue, serum and other physiological samples, resulting in protein characterization, identification and biomarker discovery. The laboratory is equipped with 4 mass spectrometers that are capable of identifying and quantitating femtomole levels of biomolecules such as peptides and proteins.

The Nanofabrication Laboratory is equipped to manufacture hydrogel nanoparticles used for biomarker discovery and the development of diagnostic tests. A novel protein painting technology developed in the lab identifies hot spots of protein-protein interaction.

The CAP/CLIA Clinical Proteomics Laboratory, the first in the United States to be dedicated solely to proteomics translational research, operates under the College of American Pathologists (CAP) and Clinical Laboratory Improvement Amendments (CLIA) guidelines to:

- Provide a unique opportunity to assess and evaluate new proteomic technologies under rigorous clinical guidelines
- Accelerate the verification and validation of promising candidate biomarkers in a clinical diagnostic setting
- Implement unique clinical trials and diagnostic tests

The CAP Clinical Proteomics Laboratory uses an Aushon 2470 Automated, High-Throughput Protein Arrayer, and a Dako robotic autostainer to generate protein arrays and perform immunohistochemistry for analysis of tissue and cellular samples for biomarker discovery. An

Immolute 1000 Immunoassay instrument is also available to measure protein analytes and perform clinical tests.

Contact:

Amy Adams
Center for Applied Proteomics and Molecular Medicine
avanmete@gmu.edu
(703)993-2672

METABOLOMICS SEQUENCING:

The **Metabolomics Laboratory** houses several chromatography instruments, including a GC-FID, GC-NPD, and semi-preparative and preparative HPLCs. The metabolomics platform is centered on an Agilent 7890A Gas Chromatograph with 5975C Mass Spectrometer, an Agilent 1290 Infinity LC with a 6530 QToF (MS/MS), and an Agilent 1100 LC-MSD (with interchangeable ESI, APPI, and APCI sources). Coupled with custom designed software algorithms and the commercially purchased Agilent Mass Profiler Professional software package, these instruments enable a comprehensive examination of volatile and non-volatile metabolites present in biological samples

Contact:

Robin Couch, PhD
Department of Chemistry & Biochemistry
rcouch@gmu.edu
(703)993-4770

GENOMIC SEQUENCING:

The **MicoBiome Analysis Center** has a separate PCR room with 10 PCR machines, an ABI 3130xl sequencer, a Life Technology RT PCR instrument, an Ion Torrent PGM sequencer (4 million reads/run), an Ion Torrent S5 (80 million reads/run), and high-end computational facilities. The computational facilities include 10 iMac computers, a 48 processor HP workstation, two development HP servers, and access to a 640 node SGI cluster. A wide array of bioinformatics software is accessible through networked computers within the DNA research labs.

Contact:

Pat Gillevet, PhD
Microbiome Analysis Center
pgilleve@gmu.edu
(703)993-1057

MACROMOLECULAR/SMALL MOLECULE ENGINEERING AND SPECTROSCOPY:

The **Small Molecule, Peptide, and Protein Engineering Spectroscopy Laboratory** is equipped for small molecule, protein, and peptide synthesis. Computational chemistry experiments are performed using a variety of available software on the Mason Argo cluster. Proteins are expressed in either bacterial or mammalian cells. Molecular characterizations are performed using a Bruker AVANCE III HD 400 MHz NMR.

The NMR Laboratory is equipped with a Bruker AVANCE III HD 400 MHz NMR instrument for multi-dimensional magnetic resonance spectroscopy experiments, including structure determination/confirmation of small molecules. It's Diffusion Ordered Spectroscopy (DOSY) capabilities enable investigation of intermolecular interactions. The instrument is equipped with Bruker's SMART Probe technology for enhanced resolution and an automatic sample changer for processing up to 24 samples.

The **Spectroscopy Laboratory** is also equipped with 1) Jasco FP-8300 Spectrofluorometer w/ Peltier temperature control and polarizers, 2) Jasco FTIR4100 Infrared Spectrometer w/ Peltier temperature control and protein secondary structure prediction software, 3) Bio-Tek Eon Microplate Spectrophotometer, 4) Molecular Devices SpectraMax Gemini EM Microplate Spectrofluorometer, 5) Tecan Spark 10M Spectrophotometer w/ AlphaScreen and chemiluminescence, 6) Rudolph AUTOPOL IV Polarimeter, 7) Rudolph J357 Automatic Refractometer, and 8) Jasco J-1500 Spectropolarimeter.

Contact:

Mikell Paige, PhD

Expertise: Small molecule design/synthesis and spectroscopy

Department of Chemistry & Biochemistry

mpaige3@gmu.edu

(703)993-1075

Barney Bishop, PhD

Expertise: Peptide engineering and macromolecular spectroscopy

Department of Chemistry & Biochemistry

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Young-Ok You, PhD

Expertise: Protein engineering/enzymology

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yyou@gmu.edu

(703) 993-7141

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EASTERN VIRGINIA MEDICAL SCHOOL

[NAME]

OLD DOMINION UNIVERSITY



[Morris Foster, Vice President for Research]

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

[NAME]

EXHIBIT A

Shared Resource Directors for each Institution:

Karen Eck, PhD
Assistant Vice President for Research
Office of Research
Old Dominion University
4111 Monarch Way, Suite 203
Norfolk, VA 23508
(757) 683-3707
keck@odu.edu

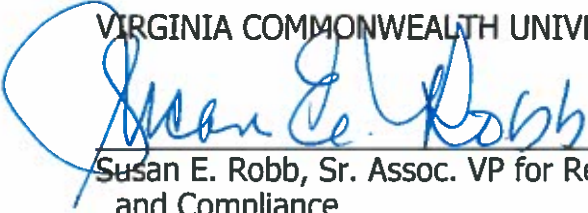
EXHIBIT B
SHARED RESOURCES AVAILABLE AT EACH INSTITUTION

OLD DOMINION UNIVERSITY

<u>Account Code</u>	<u>Project Director</u>	<u>Account Title</u>	<u>Account Short Title</u>	<u>Status</u>	<u>PI Home Department Code</u>
956200-010	BRITCHER, C.	VIPER DYNAMOMETER / INSTRU LAB	VIPER LAB	A	MECHANICAL AND AEROSPACE ENGINEERING
956500-010	ELSAYED-ALI, H.	ARC EQUIPMENT USAGE	ARC EQUIPMENT	A	<u>APPLIED RESEARCH CENT</u>
957300-010	CATRAVAS, J.	FLOW CYTOMETRY FACILITY	FACS-ARIA	A	FRANK REIDY CENTER FO BIOELECTRICS
958100-010	PLATSOUCAS, C.	CENTER-ISOTOPE*TRACE ELEMENTS	CENTER-ISOTOPE*	A	BIOLOGICAL SCIENCES
958100-020	DAINES, D.	ELECTRON MICROSCOPY LAB	ELECTRON MICROS	A	BIOLOGICAL SCIENCES
958100-021	DAINES, D.	DNA SEQUENCER	DNA SEQUENCER	A	BIOLOGICAL SCIENCES
958100-022	DAINES, D.	BIOLOGY VEHICLE USAGE	BIOLOGY VEHICLE	A	BIOLOGICAL SCIENCES
958110-001	DAINES, D.	RESEARCH FACULTY-MARSHALL, H.	RES FAC-MARSHAL	A	BIOLOGICAL SCIENCES
958200-010	DONAT, J.	CBP WQL-CC AUTOANALYZER	CBP WQL-CC AUTO	A	CHEMISTRY & BIOCHEMISTRY DEPT
958200-011	DONAT, J.	CBP WQL-CC C/N ANALYZER	CBP WQL-CC C/N	A	CHEMISTRY & BIOCHEMISTRY DEPT
958200-012	DONAT, J.	CBP WQL-CC SPECTROPHOTO	CBP WQL-CC SPEC	A	CHEMISTRY & BIOCHEMISTRY DEPT
958200-013	DONAT, J.	CBP WQL-CC STD ANALYSES	CBP WQL-CC STD	A	CHEMISTRY & BIOCHEMISTRY DEPT
958200-014	DONAT, J.	CBP WQL-CC FIELD EQUIPMENT	CBP WQL-CC FIEL	A	CHEMISTRY & BIOCHEMISTRY DEPT
958200-015	DONAT, J.	CBP WQL-CC R/V BAYRUNNER	CBP WQL-CC R/V	A	CHEMISTRY & BIOCHEMISTRY DEPT
958200-020	HATCHER, P.	<u>MAJOR INSTRUMENTATION CLUSTER</u>	COSMIC	A	CHEMISTRY & BIOCHEMISTRY DEPT
958200-021	HATCHER, P.	CENTER-IRMS	IRMS	A	CHEMISTRY & BIOCHEMISTRY DEPT
958500-010	HARVEY, R.	R/V FAY SLOVER	R/V FAY SLOVER	A	OCEAN, EARTH & ATMOSPHERIC SCIENCE
958500-011	HARVEY, R.	RESEARCH VESSEL-SMALL BOATS	RESEARCH VESSEL	A	OCEAN, EARTH & ATMOSPHERIC SCIENCE
958500-012	HARVEY, R.	ELECTRONIC SUPPORT	ELECTRONIC SUPP	A	OCEAN, EARTH & ATMOSPHERIC SCIENCE

958500-020	DARBY, D.	ELECTRON PROBE MICROANALYZER	EPMA-ELECTRON	A	OCEAN, EARTH & ATMOSPHERIC SCIENCE
958600-010	PLATSOUCAS, C.	VIRTUAL ENVIRONMENTS LABS	VIRTUAL ENVIRON	A	CTR FOR COASTAL PHYSICAL OCEAN
958600-011	ATKINSON, L.	CCPO PROFILER COST CTR	CCPO PROFILER C	A	CTR FOR COASTAL PHYSICAL OCEAN
958600-012	SEDWICK, P.	ICP - MS FACILITY	ICP - MS CC	A	CTR FOR COASTAL PHYSICAL OCEAN
958800-010	FOSTER, M.	ANIMAL CARE FACILITY	ANIMAL CARE FAC	A	OFFICE OF RESEARCH
958800-011	FOSTER, M.	ANIMAL CARE OPERATIONS	ANIMAL CARE OPS	A	OFFICE OF RESEARCH
959300-010	RANJAN, D.	CS COST CENTER	CS COST CENTER	A	COMPUTER SCIENCES

VIRGINIA COMMONWEALTH UNIVERSITY



Susan E. Robb, Sr. Assoc. VP for Research Administration
and Compliance

COLLEGE OF WILLIAM AND MARY

[NAME]

GEORGE MASON UNIVERSITY

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UNIVERSITY OF VIRGINIA

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EASTERN VIRGINIA MEDICAL SCHOOL

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OLD DOMINION UNIVERSITY

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VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

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EXHIBIT A

Shared Resource Directors for each Institution:

Virginia Commonwealth University
Paul Fawcett, Ph.D.
Assistant Professor of Internal Medicine and
Director of Research Infrastructure
paul.fawcett@vcuhealth.org
(804) 827-0975

EXHIBIT B
SHARED RESOURCES AVAILABLE AT EACH INSTITUTION

- Center for Molecular Imaging (<http://www.molecularimaging.vcu.edu/>)
- Chemical and Proteomic Mass Spectrometry Core Facility (<https://chemistry.vcu.edu/research/facilities/chemical-and-proteomic-mass-spectrometry-core-facility/>)
- Cancer Mouse Models Shared Resource (<https://www.massey.vcu.edu/research/cores/cmmc/>)
- Flow Cytometry Core Facility (<https://www.massey.vcu.edu/research/cores/flow-cytometry/>)
- Lipidomics & Metabolomics Core Facility (http://www.biochemistry.vcu.edu/Research/lipidomics_core.html)
- Microscopy Core Facility (<http://www.anatomy.vcu.edu/microscopy/>)
- Nanomaterials Characterization Core: (<http://nano.vcu.edu/>)
- Nucleic Acid Research Facilities / Genomics Core Facility (<http://www.narf.vcu.edu/>)
- Structural Biology Core Facility (<https://www.massey.vcu.edu/research/cores/structural-biology/>)
- Tissue and Data Acquisition and Analysis Core Facility (<https://www.massey.vcu.edu/research/cores/tdaac/>)
- Transgenic and Knock-out Mouse Core Facility (<https://www.massey.vcu.edu/research/cores/tmf/>)

VIRGINIA COMMONWEALTH UNIVERSITY

[NAME]

COLLEGE OF WILLIAM AND MARY

[NAME]

GEORGE MASON UNIVERSITY

[NAME]

UNIVERSITY OF VIRGINIA

[NAME]

EASTERN VIRGINIA MEDICAL SCHOOL

 1/16/2017
Richard V. Homan, MD Date
President & Provost,
Dean of the School of Medicine

OLD DOMINION UNIVERSITY

[NAME]

VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

[NAME]

EXHIBIT A

Shared Resource Directors for each Institution:

EVMS Biorepository and Histology Core	Laurie Wellman PhD. wellmall@evms.edu
Flow Cytometry Core	Woong-Ki Kim PhD kimw@evms.edu
Microscopy and Imaging Core	Frank Lattanzio PhD Lattanfa@evms.edu
Proteomics Core	Julius Nywalwidhe PhD Nyalwijo@evms.edu
Molecular Core Facility	Julia Sharp PhD molecularcore@evms.edu
Bioinformatics and Bioanalytic Core	Patric Lundburg PhD lundbeps@evms.edu

Following added by UVA per email instruction from EMVS. The EMVS Point of Contact for Shared Resources is Dr. William J. Wasilenko, 757-446-8480