

Institution Information

Type of Institution:

- | | | |
|--|--|--|
| <input type="checkbox"/> Academia | <input type="checkbox"/> Battelle Columbus | <input type="checkbox"/> DOE Lab (other than PNNL) |
| <input type="checkbox"/> Foreign National Laboratory | <input type="checkbox"/> Other Government Agency | <input type="checkbox"/> PNNL |
| <input type="checkbox"/> EMSL (if line staff) | <input type="checkbox"/> Private Industry | <input type="checkbox"/> Other (please specify): |
-

Institution Name

Department

Business Address

City

State/Province
(if U.S. or Canada)

Postal Code

Country

PART 2. DETAILS

Primary Research Area:

- | | | |
|--|---|--|
| <input type="checkbox"/> Materials Science (incl. condensed matter phys. & material chem.) | <input type="checkbox"/> Polymers | <input type="checkbox"/> Environmental Sciences |
| <input type="checkbox"/> Physics (excludes condensed matter physics) | <input type="checkbox"/> Medical Applications | <input type="checkbox"/> Optics |
| <input type="checkbox"/> Chemistry (excludes materials chemistry) | <input type="checkbox"/> Biological and Life Sciences (excludes medical applications) | <input type="checkbox"/> Engineering |
| | <input type="checkbox"/> Earth Sciences | <input type="checkbox"/> Other (please specify): |
-

Proposal Title (*must be typed or pasted into text box using plain text only*):

Abstract: (*must be typed or pasted into text box using plain text only, 500 word limit.* Abstracts for approved general use proposals and proposals in response to periodic calls **will be posted on the EMSL website as received.**)

Project Description: (.pdf or .doc(x) file, 4-page limit, including charts, graphs, maps, photographs, and other pictorial presentations). Do not repeat the abstract. Project Description should include:

- **Title of Proposed Project** – Must be brief, scientifically or technically valid, intelligible to a scientifically or technically literate reader, and suitable for use in the public press.
- **Background/Introduction** (approximately 500 words) – Scientific question(s) being addressed, especially as related to EMSL's mission.
- **Approach** (approximately 2500 words) – Describe the work to be conducted at EMSL in the first year of the project, along with your overarching primary goals and the anticipated importance or significance of results to be obtained. Include any

preliminary background measurements, or completed tests that validate the approach (include references where relevant and attach the full citations as an addendum).

- **Computational Approach (optional, additional 1 page maximum)** – If **compute cycles** are requested, include an additional one page to specify method or approach, software to be used (include scaling examples if not NWChem), and a strong justification for hours requested (number, size, duration of calculations). Allocations are awarded in units of node-hours wall-clock time, and each node contains 8 processor-cores.

CVs and Additional Files: In addition to your Project Description, the following files are required *in the order listed below*.

- **Addendum 1: References (optional)** – Should be submitted as an additional file (not embedded in the text). Each reference must include the names of all authors (in the same sequence in which they appear in the publication), the article and journal title, book title, volume number, page numbers, and year of publication. If the document is available electronically, the website address or DOI should be included. Proposers must be especially careful to follow accepted scholarly practices in providing citations for source materials relied upon when preparing any section of the proposal. While there is no established page limitation for the references, this section must include bibliographic citations only and *must not be used to provide parenthetical information outside of the 4-page Project Description*.
- **Addendum 2: CVs** – Must include abbreviated curriculum vitae (**2-page maximum each**) for the PI and each of the key investigators that would impact the review of the team’s qualifications (Criterion 2).
- **Addendum 3: Resources Needed** – Include a table of resources requested for the first year of your project (instruments **and** staff support), including the number of samples, units requested, the period of use, the expertise of team members who will be using the resource(s), and the requested EMSL staff support (template provided below; an example is provided on EMSL’s website).

“Units Requested” can be instrument hours, node-hours for the super computer, or gigabytes for data archive storage. If you’re uncertain about the number of hours to request, select “1”, and EMSL management will adjust your request based on your Project Description. See the table below for examples.

Resource	# of Samples	Units Requested <i>(specify unit)</i>	Period of Use	Project Team Expertise	EMSL Support Requested

- **Addendum 4: Suggested Reviewers or Reviewers Not to Include (optional)** – You may include a list of suggested reviewers who you feel are especially well-qualified to review the proposal or persons you would prefer not to review the proposal (indicating why) may be included. These suggestions are optional. The Capability Lead handling the proposal will consider the suggestions and may contact you for further information. The decision whether or not to use the suggestions remains with the Capability Lead.

Preferred Start Date: _____ **Preferred End Date:** _____

Proposal Type: Select one.

- Current Call** – Submitted in response to specific annual calls and available only during the timeframe of the Call. Open for one year, with 1-2 extensions possible, depending on the Call. Proposals should identify the specific focus or the one that most closely matches from the Call’s advertised options. See below for examples.
 - Science Theme:
 - Biological Interactions and Dynamics
 - Geochemistry/Biogeochemistry and Subsurface Science
 - Science of Interfacial Phenomena
 - Capabilities-Based
 - 900 MHz NMR
- General** – May be submitted at any time and are open for up to one year only. Only limited resources are available for these proposals.
- Rapid** – Short-term access for rapid turnaround to meet specific deadline (e.g., follow-up experiment to finalize publication; final data run on thesis, initial experiment for funding proposal preparation, or proof of principle experiment before developing a full proposal., etc.). Open for 30 days only. ***Must clearly state approaching deadline and provide detailed justification. For proof of principle requests, sufficient detail should be given to convince the reviewers that a proof of principle is required and that the proposal is not simply a small-scale experiment which would not meet the requirements of a larger proposal.***
- Proprietary** – Research will not be publishable and may require full-cost recovery. Open for up to one year only.
- Partner** – ONLY for users with approved Letter of Intent to co-develop and co-fund a project with EMSL. Open for time determined by EMSL’s Partner Panel.
- Resource Owner** – ONLY for PIs who own or co-own resources with EMSL. Open for one year, with two extensions possible.

Is this proposal associated with a National Science Foundation Supplemental Funding Request? Yes No
<http://www.nsf.gov/pubs/2004/nsf04025/nsf04025.htm>

Will you desire the assistance of EMSL staff in obtaining and interpreting the results? Yes No

PNNL Staff Contact: _____

Resources

Select all resources needed and enter an estimate of the time needed **for each during the first year** of the proposal. Resources are listed by capabilities, and operate either 24 hours a day/7 days a week or 10 hours a day/5 days a week. Operating hours by instrument are listed on EMSL's website (<http://www.emsl.pnl.gov/capabilities/instrumentList.jsp>).

Cell Isolation and Systems Analysis

Cell Culture

- _____ Mammalian Cell Culture
- _____ Microbial Microbioreactors – (avail. Oct. 2011)

Cell Isolation and Fractionation

- _____ Flow Cytometer: Influx
- _____ Laser Capture Microdissection

Fluorescence Microscopy/Spectroscopy

- _____ Microscope: Confocal, Multi-Photon/FLIM Integrated
- _____ Microscope: Fluorescence, Confocal, Real-Time – (avail. Apr. 2011)
- _____ Microscope: Fluorescence, Single Molecule
- _____ Microscope: Fluorescence, Single Molecule/Patch Clamp
- _____ Microscope: Scanning Probe – AFM Compound
- _____ Microscope: STORM

Secondary CISA Resources

- _____ Electron Microscope: Dual FIB/SEM (FEI Helios)
- _____ Electron Microscope: Transmission, CRYO 2005
- _____ NMR Spectrometer: 2 Tesla Horizontal Bore Varian (Imaging)
- _____ NMR Spectrometer: 500 MHz WB Bruker (Imaging)
- _____ NMR Spectrometer: 600 MHz NB Varian LC-NMR System – metabolomics cryoprobe (Liquids) – (*subscribed through September 2011*)
- _____ NMR Spectrometer: 750 MHz (17.6 Tesla) WB Bruker (Solids, Liquids, Imaging) – (avail. Apr. 2011)

Transcriptomics

- _____ SoLiD4 Sequencers

Computing

Data File Storage

- _____ Computing: Data File Storage (Aurora)

Graphics

- _____ Computing: SGI 16-processor Graphics Server (NWVisus)

Small Clusters

- _____ Computing: NW-ICE
- _____ Computing: Spokane cluster

Super Computing

- _____ Computing: Chinook (HP 2310-Node Linux Cluster)

Deposition/Microfabrication

Ion/Molecular Beam Spectrometry

- _____ Ion Accelerator, Beam Lines, and End Stations
- _____ Liquid-Beam Source
- _____ Surface Dynamics/Ion Deposition System

Microfabrication

- _____ Electron Microscope: Dual FIB/SEM (FEI Helios)
- _____ Microfabrication Laboratory (Clean Room)
- _____ Microfabrication: Deep Reactive Ion Etching System
- _____ Microfabrication: Mask Aligner
- _____ Microfabrication: Nanoimprinter

Thin Film Deposition

- _____ Deposition: Molecular Beam Epitaxy #1
- _____ Deposition: Molecular Beam Epitaxy #2
- _____ Deposition: Pulsed Laser Deposition System
- _____ Deposition: Hybrid Thin Film Deposition System
- _____ Mass-Selected Ion Deposition System – Electrospray Source

Mass Spectrometry

Aerosol Particle Characterization

- _____ Mass Spectrometer: Aerosol - Time-of-Flight, High Resolution
- _____ Mass Spectrometer: Inductively Coupled Plasma (ICP-MS), High Resolution (Element XR)
- _____ Mass Spectrometer: Inductively Coupled Plasma (ICP-MS), Multi-Collector (Neptune Plus)
- _____ Mass Spectrometer: Inductively Coupled Plasma (ICP-MS), Ultra-High Resolution
- _____ Mass Spectrometer: Linear Ion Trap Quadrupole (LTQ) Orbitrap MS - for environmental research
- _____ Mass Spectrometer: Proton Transfer Reaction (PTRMS)
- _____ Mass Spectrometer: Single Particle (SPLAT II)
- _____ Mass-Selected Ion Deposition System – Electrospray Source

Imaging

- _____ Mass Spectrometer: MALDI FTICR
- _____ Mass Spectrometer: MALDI-TOF

Ion Surface

- _____ Analytical: Inductively Coupled Plasma-Mass Spec (ICP-MS)
- _____ Mass Spectrometer: FT-ICR 6 T (Ion Surface Collisions)
- _____ Mass Spectrometer: Time of Flight Secondary Ion (ToF SIMS) - 1997
- _____ Mass Spectrometer: Time of Flight Secondary Ion (ToF SIMS) – 2007

Isotopic Elemental Analysis

- _____ Mass Spectrometer: Inductively Coupled Plasma (ICP-MS), High Resolution (Element XR)
- _____ Mass Spectrometer: Inductively Coupled Plasma (ICP-MS), Multi-Collector (Neptune Plus)
- _____ Mass Spectrometer: Inductively Coupled Plasma (ICP-MS), Ultra-High Resolution

Metallomics

- _____ Mass Spectrometer: Inductively Coupled Plasma (ICP-MS) System, Metallomics (avail. Jun. 2011)

Proteomics/Biological

- _____ Mass Spectrometer: Fourier Transform Ion Cyclotron Resonance
- _____ Mass Spectrometer: Ion Mobility Time of Flight
- _____ Mass Spectrometer: Linear Ion Trap (LTQ)
- _____ Mass Spectrometer: Orbitrap
- _____ Mass Spectrometer: MALDI FTICR
- _____ Mass Spectrometer: MALDI TOF
- _____ Mass Spectrometer: LC Triple Quadrupole
- _____ Mass Spectrometer: GC Triple Quad – (avail. Mar. 2011)
- _____ Mass Spectrometer: Chromatograph, Liquid, qTRAP – (avail. Mar. 2011)
- _____ Mass Spectrometer: Ion Mobility Spectrometry, Time of Flight - (avail. Mar. 2011)

Microscopy

Aerosol Particle Characterization

- ___ Electron Microscope: Dual FIB/SEM, Environmental (FEI Quanta)
- ___ Mass Spectrometer: Single Particle (SPLAT II)

Electron

- ___ Electron Microprobe
- ___ Electron Microscope: Photoemission (PEEM)
- ___ Electron Microscope: Dual FIB/SEM (FEI Helios)
- ___ Electron Microscope: Dual FIB/SEM, Environmental (FEI Quanta)
- ___ Electron Microscope: Dual FIB/SEM, Environmental for radiological samples (Quanta)
- ___ Electron Microscope: Transmission, Aberration Corrected
- ___ Electron Microscope: Transmission, CRYO 2005
- ___ Electron Spectrometer: XPS Imaging – (avail. Mar. 2011)
- ___ Electron Spectrometer: Auger/Scanning Auger

Ion

- ___ Microscope: Helium Ion
- ___ Spectrometer: Atom Probe

Optical

- ___ Mammalian Cell Culture
- ___ Microscope: Fluorescence, Single-Molecule
- ___ Microscope: Fluorescence, Single-Molecule / Patch Clamp
- ___ Microscope: Raman, Confocal

- ___ NMR Spectrometer: 500 MHz WB Bruker (Imaging)
- ___ Spectrometer: Fluorescence, Cryogenic
- ___ Spectrometer: FTIR - Standard
- ___ Spectroscopy: Fluorescence, Time-resolved
- ___ Spectrometer: Raman/Epifluorescence, Inverted Confocal

Scanning Probes

- ___ Geochemistry AFM
- ___ Microscope: Scanning Probe – AFM Compound
- ___ Microscope: Scanning Probe – AFM, Bioscope
- ___ Microscope: Scanning Probe, DI Nanoscope IIIa Multimode
- ___ Microscope: Scanning Probe – Dynamic Force
- ___ Microscope: Scanning Probe, Scattering IR SNOM – (avail. Aug. 2011)
- ___ Microscope: Scanning Probe, STM/AFM, Low Temperature, UHV – (avail. Mar. 2011)
- ___ Microscope: Scanning Probe - STM/AFM, PicoSPM
- ___ Microscope: Scanning Probe, Variable Temperature
- ___ Microscope: Scanning Probe, Variable Temperature UHV

Tomography

- ___ Electron Microscope: Transmission, Aberration Corrected
- ___ Electron Microscope: Transmission, CRYO 2005
- ___ Computed X-ray Tomography

NMR and EPR

EPR

- ___ EPR Spectrometer Pulsed/CW (X-band, 9.5 GHz)
- ___ EPR Spectrometer: High Field (W-band, 95 GHz) – (avail. Apr. 2011)

High-Resolution Liquids

- ___ NMR Spectrometer: 600 MHz NB Varian Inova (Liquids) – *(subscribed through September 2011)*
- ___ NMR Spectrometer: 600 MHz NB Varian Inova – Cryoprobe (Liquids) – *(subscribed through September 2011)*
- ___ NMR Spectrometer: 600 MHz NB Varian LC-NMR System - metabolomics cryoprobe (Liquids) – *(subscribed through September 2011)*
- ___ NMR Spectrometer: 750 MHz NB (17.6 Tesla) Varian
- ___ NMR Spectrometer: 750 MHz (17.6 Tesla) WB Bruker (Solids, Liquids, Imaging) – (avail. Apr. 2011)
- ___ NMR Spectrometer: 800 MHz (18.8 Tesla) Varian Cryoprobe (liquids)
- ___ NMR Spectrometer: 900 MHz (21.1 Tesla) Varian – *(subscribed through September 2011)*

Imaging

- ___ NMR Spectrometer: 2 Tesla Horizontal Bore Varian (Imaging)
- ___ NMR Spectrometer: 500 MHz WB Bruker (Imaging)
- ___ NMR Spectrometer: 750 MHz (17.6 Tesla) WB Bruker (Solids, Liquids, Imaging) – (avail. Apr. 2011)

Solid-State

- ___ NMR Spectrometer: 300 MHz WB Varian (Solids)
- ___ NMR Spectrometer: 500 MHz WB Varian (solids) – *(subscribed through September 2011)*
- ___ NMR Spectrometer: 750 MHz NB (17.6 Tesla) Varian
- ___ NMR Spectrometer: 750 MHz (17.6 Tesla) WB Bruker (Solids, Liquids, Imaging) – (avail. Apr. 2011)
- ___ NMR Spectrometer: 850 MHz (20 Tesla) WB Varian (Solids) – (avail. Apr. 2011)
- ___ NMR Spectrometer: 900 MHz (21.1 Tesla) Varian – *(subscribed through September 2011)*

Spectroscopy/Diffraction

Electron

- ___ Catalysis: UHV Model Catalysts, High Pressure
- ___ Electron and Photon Stimulated Desorption (BES 2)
- ___ Electron Spectrometer: XPS Imaging – (avail. Mar. 2011)
- ___ Electron Spectrometer: Auger/Scanning Auger
- ___ Electron Spectrometer: HREELS, UHV Surface Chemistry
- ___ Electron Spectrometer: Scanning Multiprobe Surface Analysis System - Versaprobe
- ___ Electron Spectrometer: Scanning XPS Microprobe, High Resolution (Quantero)
- ___ Electron Spectrometer: XPS with Laser Interface
- ___ Photoelectron Spectrometer – Low Temperature

Fluorescence

- ___ Spectrometer: Fluorimeter
- ___ Spectrometer: Fluorescence, Cryogenic
- ___ Spectrometer: Fluorescence, Picosecond
- ___ Spectrometer: Fluorescence, Time-resolved

Infrared

- ___ Atmospheric Pressure Reactor System
- ___ Energetic Processes (Surfaces/Solids) Instrumentation w/Lasers
- ___ Spectrometer: FTIR – Standard
- ___ Spectrometer: FTIR – High Resolution
- ___ Transient Kinetic Analysis (TKA)

Ion/Molecular Beam Spectrometry

- ___ Ion Accelerator, Beam Lines, and End Stations
- ___ Surface Dynamics/Ion Deposition System

- ___ Microscope: Helium Ion
- ___ Molecular Beam Kinetics
- ___ Spectrometer: Atom Probe

Mössbauer

- ___ Spectrometer: Mössbauer

Optical

- ___ Spectrometer: Circular Dichroism
- ___ Spectrometer: Stopped-Flow, Absorbance, BioLOGIC SFM-400
- ___ Spectrometer: Sum Frequency/Second Harmonic Generation, Picosecond, Surface Spectroscopy – (avail. Mar. 2011)
- ___ Spectrometer: Sum Frequency/Second Harmonic Generation, Femto-Picosecond, High Resolution, Ultrafast Dynamics

Raman

- ___ Spectrometer: Raman, Dispersive
- ___ Spectrometer: Raman, Confocal
- ___ Spectrometer: Raman, Fourier-Transform
- ___ Spectrometer: Raman/Epifluorescence, Inverted Confocal

X-ray Diffraction and Tomography

- ___ X-ray Diffraction: Four-Circle
- ___ X-ray Diffraction: General Purpose
- ___ X-ray Diffraction: Microbeam
- ___ X-ray Diffraction: Special Applications
- ___ Computed X-ray Tomography

Subsurface Flow and Transport

Analytical

- ___ Analytical: Chromatograph: Ion
- ___ Analytical: Chromatograph: Gas/Mass Spec System 2005
- ___ Analytical: Chromatograph: Liquid
- ___ Analytical: Inductively Coupled Plasma-Mass Spec (ICP-MS)
- ___ Analytical: Total Organic Carbon Analyzer (TOC)

Flow Cells

- ___ SFTEL: Flow Cell
- ___ SFTEL: Hydraulic Property Apparati
- ___ SFTEL: Pore Scale Micromodels – (avail. Mar. 2011)

Tomography

- ___ Computed X-ray Tomography

PART 3. LOGISTICS

Funding Agencies:

DOE requires that we report on the subject discipline of all proposals. Select all funding agencies associated with your proposed research.

- Department of Defense
- DOE, Office of Advanced Scientific Computing Research
- DOE, Office of Biological & Environmental Research
- DOE, Office of Environmental Management
- DOE, Office of Nonproliferation & National Security
- DOE, Other: _____
- Environmental Protection Agency
- Foreign Government Agency
- Industry, Foreign
- LDRD, Other National Lab
- LDRD, PNNL
- National Aeronautics and Space Administration
- National Institutes of Health
- National Science Foundation
- Nuclear Regulatory Commission
- Other U.S. Government Agency: _____
- University, Foreign
- University, U.S.
- Other (please specify): _____

Work Package # (required for PNNL employees only to verify if work is government or private): _____

Materials & Equipment

Will your research involve the use of human blood, tissues, DNA, cells, cell lines, or human biological samples in any form?

Yes No

Does your work involve the use of live animals?

Yes No

Will you be bringing or sending any chemicals to the EMSL facility?

Yes No

Does your experiment on EMSL resources involvesamples?

Yes No

Do any of your samples contain bound or unbound engineered nanoparticles?

Yes No

Do any of your samples contain radioactive isotopes?

Yes No

If bringing/sending samples, what are your plans?

Ship Hand Carry Other, Specify _____

Will you need to perform sample preparation at EMSL?

Yes No

At the end of the project, the samples should be Returned to you Disposed at EMSL Other, Specify _____

Note: Do not ship any equipment, chemicals or samples to EMSL/PNNL without first coordinating with your host or the User Support Office, (509) 371-6003. Samples will not be accepted without a Sample Submission Form. In addition to EMSL regulations, users are responsible for adhering to all Department of Transportation regulations.

User Equipment: If you intend to bring equipment to EMSL, including computers that will need to connect to the PNNL network, please list them here.

Comments: If you have any additional needs or comments regarding the proposal or the process, please enter them here:
