



Overview

The ANML is devoted to developing material and manufacturing solutions for emerging engineering problems without regard for political, socioeconomic, or cultural boundaries. The ANML is led by Professor David Estrada. The ANML is not a recharge center, and thus, access to resources is prioritized for sponsored programs and ANML researchers and affiliates.

The ANML facilities are located at the Micron Center for Materials Research (MCMR) Building at Boise State University and are dedicated to the research listed below.

- MCMR 121 & 123 focus on nano and 2D materials synthesis, nanomaterial-based ink formulation, and characterization.
- MCMR 125 is a shared user laboratory where 1-3 Bays are devoted to the ANML thin films suite, which is equipped with instruments to support thin film growth, device fabrication, and material/device post-processing.
- MCMR 131 is dedicated to bioengineering, focusing on tissue engineering and regenerative medicine.
- MCMR 229 houses advanced materials characterization tools that support materials and device development.
- MCMR 126 is a shared space and houses the Raman tool.
- MCMR 138 houses electrical and thermal transport measurement tools.

For more details on the equipment and capabilities, please visit <https://www.boisestate.edu/coen-anml/>.

Please submit this form and all other requested documents as individual attachments to anml@boisestate.edu. If the required documents are not attached, it is highly likely the request will be automatically rejected.

Request Details

Request Type:

Sample Characterization
New Request

Tool Training and Use
Renewal Request

**It is recommended that ANML tool leads complete characterization when few samples need analyzed. Tool training is recommended when there will be regular, long-term use of the tool for a large number of samples.*

Please give a justification for renewal (if applicable):

Project Title:

Requestor/User:

PI/Research Advisor:

Funding Source (Consumables & Potential Repairs):

Requested Tools (Select all that apply):

*Tools highlighted in blue are not available for training, an ANML researcher will work with you to complete sample characterization

MCMR 121 – Nanomaterial Ink Synthesis & Characterization

Allegra 64R Fixed Angle Centrifuge	Silverson Shear Mixer
Beckman Optima XE-90 Ultracentrifuge	Repligen Tangential Flow Filtration (TFF) System
B'U'CHI Rotovapor	QSonica Probe Tip Sonicators (Q125 & Q700)
Micro-Viscometer	Nordson EFD Extrusion Printer
Brookfield DV3T Extra / EVNext Rheometers	StonyLab Electrospinning Machine
Fractionator	Thinky Conditioning Mixer

MCMR 123 – Nanomaterial Ink Synthesis & Characterization

MBRAUN Glovebox (Argon)	MTI High Temperature Furnace (1500 C, 1 zone)
Agilent UV-Vis-NIR Spectrophotometer	NETZSCH STA 449 Jupiter TGA Jupiter (F5 or F1)
Biolin Scientific Tensiometer & Contact Angle	Bruker FTIR
MTI High Temp Furnace (1200 C) 1 zone or 4 zone	BioLogic SP-50 or SP-50e Potentiostat
nanoScience Langmuir-Blodgett System	NanoBrook Omni DLS

MCMR 125 – Thin Films Synthesis & Deposition

In-House CVD, Thermo Scientific Tube Furnace	PlanarTech CVD/CVT
Pfeifer He Leak Checker	Thermo Scientific Muffle Furnace

KJ Lesker Physical Vapor Deposition (PVD) 75

MCMR 131 – Bioprinting & Tissue Engineering

Tuttnauer Tabletop Autoclave	Nuaire Laminar Airflow Work Station
Cellink BioX	Nuaire Biosafety Cabinet
Cellink Lumen X	Nuaire Incubator
Tethon Bison 1000 Ceramic Printer	Zeiss Axio Imager M2.m

MCMR 138 – Transport Characterization

Cascade Microtech MicroChamber Probe Station	LakeShore Janis (4 Probes)
Tektronix Parameter Analyzer (4200A / 4200A-SCS)	LakeShore Fast Hall Measurement System
LakeShore Janis (Tabletop)	Tektronix Digital Oscilloscope

MCMR 126

Horiba Raman Spectroscopy

MCMR 229 – Surface & Interface Science

X-Ray Photoelectron Spectroscopy

AnyCubic SLA M3 Max Printer

AnyCubic DLP Photon Mono X 6K

Required Documents:

Please include all documents and certificates with the User Application.

Approved SOP attached (for procedures in ANML facilities) *

I need assistance with SOP development *

**Not required for sample characterization requests; ANML personnel can assist with SOP development if requested, but will be determined case-by-case. Please see the Acknowledgement section.*

Materials SDS attached (Required for **ALL** chemicals utilized in ANML facilities)

COEN EHS Safety Training Certificate (Access requests only)

UNH CEMS Hazardous Waste Training Completion Certificate (Access requests only):

Link to sign in and complete the course is: [EHSS/CEMS](#).

CITI Responsible Conduct in Research (RCR) Training Completion Certificate

CITI Training Bio-Modules: (Access requests for MCMR 131 Only)

Biosafety Essentials

Bloodborne Pathogens

- **PLEASE NOTE:** CITI RCR training needs to be completed by both the applicant and principal investigator.
- CITI registration can be completed here: <https://www.citiprogram.org/>. Once registered, you'll need to add the RCR module. Registration is relatively straightforward, but you may wish to watch this [short video tutorial](#).

IBC protocol (MCMR 131- Bio-Lab Only)

Access will be reviewed every 6 months. To extend your access, please resubmit the form with the "Renewal" box checked.

User Training & Costs

Due to the time investment required to train new users, ANML leadership will determine if they deem the project and scope of work sufficient to justify the training of a new user. Alternatively, ANML may decide to work collaboratively with the requestor to gather the requested data, and this determination will be made on a case-by-case basis. To determine if training on the tool(s) is justified, please answer the requested information in the "Training and Usage Justification" section. Consumables may require a funding source to cover the cost of these items. All foreseeable costs will be provided to the requestor in the MOU document sent from ANML for approved projects and will require sign-off by the requestor and PI before the requested project can proceed.

Training and Usage Justification

**This section is not needed for Renewal Request*

Detailed Description of Sample(s):

Are Samples/Materials Purchased or Synthesized? * Y N

**If samples are synthesized in-house, you must provide qualitative characterization data to verify sample composition. i.e. X-ray diffraction spectra*

Characterization needed and/or goals for research project:

Brief overview of requested procedures in ANML facilities:



Expected number of samples and frequency of equipment use:

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Potential sample hazards, including hazards from SDS(s):

Reason(s) to be trained instead of ANML personnel running samples:

Do you require assistance with data analysis? If so, what are the goals/information required?

Acknowledgments

All written publications (e.g., posters, papers, conference proceedings) and oral presentations that utilize primary (e.g., images, spectra) and/or secondary data (e.g., numerical plots) obtained using equipment and/or materials generated in the ANML should acknowledge the ANML and appropriate funding sources as indicated below and contained within the MOU provided for approved projects. The ANML personnel can assist you in crafting an appropriate experimental description/materials and methods section. Depending upon the extent of involvement, we will also require co-authorship on manuscripts (and, in some cases, grant applications and invention disclosures) if students/faculty/staff contributed significantly to a project, materials generation, and/or in manuscript preparation. If assistance with SOP development is requested, this constitutes experimental design, and the involved ANML person(s) will require co-authorship in this case. Additionally, any involvement with data analysis, figure generation, and/or experimental involvement beyond minimal data collection will require co-authorship for the ANML personnel involved. If it is discovered that the ANML is not properly acknowledged, ANML may restrict any future access for the person and/or group.

Agreement

By signing below, you indicate that you have read and agree to abide by all of the terms and conditions outlined in the User Request Form and all ANML Policies. In particular, you agree to: **a)** pay in a timely manner for any consumables and repairs necessitated by usage and **b) properly acknowledge ANML researchers and funding sources used in any publications or presentations arising from this work as indicated in the “Acknowledgement” section.**

Requestor/User eSignature:

Date:

PI/Advisor eSignature:

Date:

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General Acknowledgements:

MCMR 121 and 123

This work was partly supported through the Department of Energy Advanced Sensors and Instrumentation program under DOE Idaho Operations Office Contract DE-AC07-05ID14517. We acknowledge infrastructure support from the Department of Energy Nuclear Science User Facilities General Infrastructure Program through award numbers DE- NE0008677 and DE-NE0008496. The material presented here uses infrastructure sponsored by the Air Force Research Laboratory (AFRL) under Agreement Number FA8650-20-2-5506. The views and opinions of the authors expressed herein do not necessarily state or reflect those of the U.S. Government or any agency thereof. We also have support from the Center for Advanced Energy Studies, the Idaho Global Entrepreneurship Mission, the Micron Foundation, and the M. J. Murdock Charitable Trust. We also acknowledge support from the Center for Advanced Energy Studies, the Idaho Global Entrepreneurship Mission, and the Micron Foundation.

MCMR 125

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MCMR 131

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MCMR 126 and 229

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MCMR 138

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