RESEARCH FUTURES RETREAT

MANCHESTER COMMUNITY COLLEGE

Multi-Purpose Room
1066 Front Street, Manchester, NH

March 17, 2023 | 8:30 AM - 3:15 PM

TABLE OF CONTENTS

AGENDA

8:30 - 9:00 Continental breakfast

9:00 - 9:10 Welcome Remarks
- Brian Bicknell, President, Manchester Community College

9:10 - 9:20 Today's Objectives
- Brad Kinsey, Associate Dean for Research, UNH College of Engineering & Physical Sciences

9:20 - 9:30 Introductions

9:30 - 10:00 Research Sampler
- **Biosensors** John X.J. Zhang, Professor, Thayer School of Engineering, Dartmouth College
- **Biomaterials** Nate Oldenhuis, Assistant Professor, Department of Chemistry, UNH
- **Tissue Engineering** Katie Hixon, Assistant Professor, Thayer School of Engineering, Dartmouth College
- **Data Science** Qi Zhang, Assistant Professor, Mathematics and Statistics, UNH

10:00 - 10:20 Funding Landscape for Interdisciplinary Projects
- Michael Thompson, Director, and Maria Emanuel, Partnerships Manager Research & Large Center Development, UNH
- Charlotte Bacon, Assistant Vice Provost for Research Development and Alliances, and Allan Bieber, Senior Associate Director for Grant Support, Dartmouth College

10:20 - 10:30 Integrating Broader Impacts
- Lisa Hix, Professor, SPDI Program Chair, Keene State College
- Leslie Barber, Professor and Faculty Fellow, Community College System of New Hampshire
- Steve Hale, Project Director, Education and Workforce Development, Leitzel Center, UNH

10:30 - 10:45 Break

10:45 - 12:15 Collaboration Sessions (Round 1)

12:15 - 12:45 Networking Walk to Labs

12:45 - 1:30 Working Lunch, Entrepreneurship Discussion
- Kyung Jae Jeong, Associate Professor, Chemical Engineering, UNH & founder, JK Biomedical, LLC

1:30 - 3:00 Collaboration Sessions (Round 2)

3:00 - 3:15 Concluding Session

3:15 - 4:00 Networking (Optional)

Manchester Community College Lab Descriptions

CAD Lab

The Computer-Aided Design Lab has 15 high-powered design stations where students can create 3D models of parts and assemblies using Solidworks. Blueprints can be generated to assist in the manufacturing and inspection of parts coming off the (12) 3D printers or laser cutter. Rapid prototyping parts encourage the engineering design process and continuous improvement.

Robotics Lab

The Robotics Lab has a variety of educational and industrial robots to expose students to automated systems they would see in the industry. The focus of this lab is mechatronics, an electromechanical system that is used to program process control. Pneumatics, hydraulics, vision cameras, PLCs, HMIs, sensors, and actuators are the heart of these mechatronics systems. Students learn how to design, program, troubleshoot, and repair these systems, which is a critical skill needed today in industry.

Science Labs

MCC has laboratories for chemistry, biology, anatomy & physiology, ecology, microbiology, genetics, and physics. Lab equipment includes incubators, centrifuges, thermocyclers, a gel documentation system, iWorx physiology stations, and laptop computers. All courses incorporate inquiry-based lab experiments, and the general biology courses and genetics courses implement Course Based Undergraduate Research (CURE) in student sourcing antibiotic discovery and bioinformatics. Many students seek research opportunities after these experiences.

President Dr. Brian Bicknell Manchester Community College

Dr. Brian Bicknell became president of Manchester Community College in 2020. Previously, he served as Vice President of Academic Affairs at MCC from 2016 to 2019. As MCC's vice president, he provided leadership in development of market-driven academic programs focusing on student learning and success.

Bicknell joined MCC following a six-year tenure at Benjamin Franklin Institute of Technology (BFIT) in Boston, where he most recently served as Dean of Academic Affairs. From 2004 to 2011, Brian was the Dean of Students at Montserrat College of Art in Beverly, MA. Prior to his position at Montserrat, he was Director of Housing and Residence Life at The Boston Conservatory and began his career at Fitchburg State College directing student activities.

Dr. Bicknell attained his doctorate in Higher Education from The University of Massachusetts Boston, presenting his dissertation on "How Community College Presidents Frame the Purpose of Higher Education." He received his Master of Mental Health Counseling from Fitchburg State College and his bachelor's from Fairmont State College. As a college administrator for more than 15 years, Brian also relishes his role in the classroom and has served as adjunct faculty at Endicott College, Northeastern University and BFIT.

Biomaterials & Biomanufacturing Researchers

	Name, Affiliation, & Contact	Research Interests	Future Directions
	**Ivan Aprahamian** Professor Dartmouth Chemistry ivan.aprahamian@dartmouth.edu Aprahamian Webpage Aprahamian Research Group	Hydrazone-based molecular switches, fluorophores, sensors and adaptive materials	
	**Deb Audino** Professor Life and Physical Science Great Bay Community College daudino@ccsnh.edu Audino Webpage	Currently our NH INBRE research is looking for novel antibiotics from bacteria found in soil. It is part of the Tiny Earth Project.	Tissue Engineering
	**Aylin Aykanat** Postdoctoral Research Associate UNH Chemistry Dept aylin.aykanat@unh.edu	Biomaterials: Supramolecular Polymeric hydrogels with tunable properties and molecular engineering of metal and covalent organic framework materials.	Covalent and metal organic frameworks
	**Ian Baker** Sherman Fairchild Professor of Engineering Dartmouth Thayer Engineering School ian.baker@dartmouth.edu Baker Webpage	Materials for energy systems; mechanical behavior; phase transformations; electron microscopy; x-ray topography; x-ray diffraction; microstructure and mechanical behavior of snow, firn, and ice; magnetic materials; intermetallic compounds; high entropy	

Scott Gordan
Researcher
Dartmouth Thayer Engineering School
scott.w.gordon@dartmouth.edu
Gordan LinkedIn Webpage

Imaging, Sensors, Nanomaterials, Spectroscopy

Imaging, Sensors, Nanomaterials, Spectroscopy

MD Ahasan Habib
Assistant Professor
Keene State College
md.ahasan.habib@keene.edu
Habib Webpage

My research concentration is on design for 3D printing, scaffold architecture and bio-material design for 3D scaffold fabrication using extrusion-based 3D bioprinting technique.

Regenerate the large-scale functional tissue scaffold using 3D bio-printing process.

Jeffrey Halpern
Associate Professor
UNH Chemical Engineering
jeffrey.halpern@unh.edu
Halpern Webpage

Reusable Electrochemical Sensors for biomanufacturing and point of need use.

Ryan Halter
Associate Professor
Dartmouth Biomedical Engineering
ryan.halter@dartmouth.edu
Halter Webpage

Medical imaging; medical sensors; bioimpedance.

Katie Hixon
Assistant Professor
Dartmouth Thayer Engineering School
katherine.r.hixon@dartmouth.edu
Hixon Webpage

Tissue engineering and regenerative medicine strategies for patients with craniofacial anomalies, or delayed musculoskeletal healing. Development of novel therapies impacting dental, oral, and musculoskeletal health.

Tissue-engineered scaffold fabrication methods, multi-tissue regeneration, constructs with varying material properties (e.g., porosity, mechanical integrity, etc.) to target tissue interface.

Kyung Jae Jeong
Associate Professor
UNH Chemical Engineering
KyungJae.Jeong@unh.edu
Jeong Webpage

Biomaterials, tissue engineering

Medical product development, 3D bioprinting, wound healing

Remya Kalapurakal
Postdoctoral Research Associate
UNH Chemical Engineering
remya.mathewskalapurakal@unh.edu

Self-assembly of lobed patchy colloids to form porous structures that can be used to synthesize tissue engineering scaffolds

Chenfeng Ke
Associate Professor
Dartmouth Chemistry
chenfeng.ke@dartmouth.edu
Ke Webpage
Ke Research Group

My research group works on the development of 3D printable hydrogels with good bio compatibility.

Tissue Engineering

Brad Kinsey
Associate Dean for Research
UNH CEPS
brad.kinsey@unh.edu
Kinsey Webpage

Metallic biomaterials and implants

Loren Launen
Professor
Biology Department
Keene State College
llaunen@keene.edu
Launen Webpage
launenlab.com

Environmental microbiology, petroleum hydrocarbon degradation, bacterial genomics.

Ecotoxicology

Linqing Li
Assistant Professor
UNH Chemical Engineering
Linqing.Li@unh.edu
Li Webpage

Biomaterials, Tissue Engineering, Mechanobiology and Tissue Vascularization

Advanced biomaterials with unique structure and properties
Biomanufacturing 3D bioprinting with integrated vascular system
Vascularized Bone Tissue Engineering
Hybrid Biomaterials for Wound Healing Applications.

Katherine Mirica
Associate Professor
Dartmouth Chemistry
katherine.a.mirica@dartmouth.edu
Mirica Webpage
Mirica Research Group

Multifunctional materials for chemical sensing

Sensors, biomaterials, porous materials, multifunctional materials

Nate Oldenhuis
Assistant Professor
UNH Chemistry
nathan.oldenhuis@unh.edu
Oldenhuis Webpage
Oldenhuis Research Group

Biomaterial Chemistry, Bioreactors, Soft materials, Mechanobiology

Won Hyuk Suh
Assistant Professor
UNH-M Life Sciences
WonHyuk.Suh@unh.edu
Suh Webpage

Bioprinting and Bioink Development for Human Stem Cell Engineering (Plus Workforce Development)

High Throughput Screening and Recombinant Protein Synthesis

W. Kelley Thomas
Professor
UNH Molecular, Cellular, and Biomedical Sciences
kelley.thomas@unh.edu
Kelley Webpage

Genomics, Bioinformatics

Douglas Van Citters
Associate Professor
Dartmouth Thayer Engineering School
dvancitters@dartmouth.edu
Van Citters Webpage

Biomaterials and Biomechanics for Musculoskeletal Applications; Failure Analysis

Next generation materials for musculoskeletal health including: alternatives to Co-based bearing materials, in vivo sensors, biomaterial composites with functional gradients, bone adhesives, and modeling of the material-human interface.

Krisztina Varga
Associate Professor
UNH Molecular, Cellular, and Biomedical Sciences
krisztina.varga@unh.edu
Varga Webpage
Varga Research Group

My research focuses on protein structure-function and nanoparticles. Active research projects include: (i) antifreeze proteins and biomaterials, (ii) bacterial polar organizing protein Z, (iii) protein evolution and stability, and (iv) nanoparticles.

Biomaterials

Harish Vashisth
Professor
UNH Chemical Engineering
harish.vashisth@unh.edu
Vashisth Webpage
Vashisth Research Group

Computational Biophysics and Biomaterials

Computational Biophysics, Biomaterials, Biomolecular Modeling and Simulations, Soft Matter, and Data Science approaches

Nataliia Vereshchuk
Postdoctoral Research Associate
Dartmouth Chemistry
nataliia.vereshchuk@dartmouth.edu
Vereshchuk Webpage

Multifunctional Materials for Chemical Sensing - Metal-organic framework

Zhe Xu
Postdoctoral Research Associate
Dartmouth Thayer Engineering School
zhe.xu@dartmouth.edu
Xu Webpage

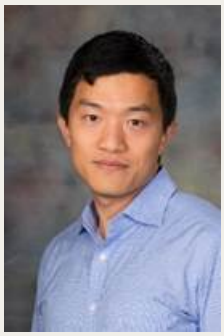
Implantable and wearable devices, advanced composite materials

Implantable and wearable devices, metamaterials

Matt Young
Assistant Professor
Science, Health, and Education
New England College
MYoung@nec.edu

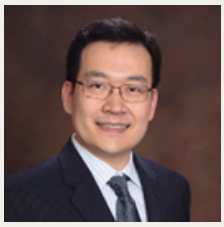
Molecular dynamics

Hydrogels



Qi Zhang
Assistant Professor
UNH Mathematics & Statistics
qi.zhang2@unh.edu
Zhang Webpage

Statistics, data science, machine learning



John Xiaojing Zhang
Professor
Dartmouth Thayer Engineering School
john.zhang@dartmouth.edu
Zhang Webpage

Biosensors, Lab on Chip, micro-nanofabrication

Wenlin Zhang
Assistant Professor
Dartmouth Chemistry
wenlin.zhang@dartmouth.edu
Zhang Webpage

Statistical mechanics and multi-scale simulations of soft matter, such as polymers, liquid crystals, and colloids.

Theory and simulations for plastic recycling and sustainability, predicting phase behaviors and material properties for soft matter

Education and Work Force Development

Leslie Barber
Professor and Faculty Fellow
CCSNH Biological Sciences
Lbarber@ccsnh.edu

Stephen Hale
Project Director
UNH Leitzel Center for Mathematics
steve.hale@unh.edu

Lisa Hix
Professor
Sustainable Product Design and Innovation (SPDI) Program Chair
Keene State College
lhix@keene.edu

Dan Larochelle
Department Chair of Advanced Manufacturing and Robotics
Manchester Community College
dlarochelle@ccsnh.edu

Matt Long
Extended Learning Opportunities Coordinator
Spark Academy of Advanced Technologies
matt.long@sparkacademynh.org

Sadie Reed-Stimmell
Professor of Biological Sciences
Manchester Community College
sstimmell@ccsnh.edu

Allison Wasiewski
Workforce Development Director
NH EPSCoR BIO-SENS
allison.wasiewski@unh.edu

Business, Industry, & Technology Transfer

Eitan Akirav
Director of Business Development
Harvard University Office of Technology Development
akiravei@gmail.com

Caitlin Aspinall
Senior Associate (Public Impact Research Development)
UNH Research and Large Center Development
caitlin.aspinall@unh.edu

Charlotte Bacon
Assistant Vice Provost for Research Development and Alliances
Dartmouth College
Charlotte.M.Bacon@dartmouth.edu

Allan Bieber
Senior Associate Director
Dartmouth Office of the Vice Provost for Research, GrantGPS
allan.j.bieber@dartmouth.edu

Don Castle
Director for Industry Engagement
Dartmouth Thayer Engineering School
don@dwcastle.com

Cindy Conde
Independent Consultant
cindy@cindyconde.net

Marc Eichenberger
Associate Vice President
UNHInnovation
marc.eichenberger@unh.edu

Maria Emanuel
Partnerships Manager
UNH Research & Large Center Development
maria.emanuel@unh.edu

Tammy Heesakker
Sr. Business Development and Licensing Manager
Dartmouth College Technology Transfer Office
tammy.a.heesakker@dartmouth.edu

Greg Lange
CEO
Simbex
glange@simbex.com

Jenna Matheny
Director, Technology Transfer
UNHInnovation
jenna.matheny@unh.edu

Karla Talanian
Chief Education & Workforce Officer
ARMI | BioFabUSA
ktalanian@armiusa.org

Michael Thompson
Director
UNH Research & Large Center Development
michael.thompson@unh.edu

NH EPSCoR Staff

Katie Ahearn
Senior Program Support Assistant
NH EPSCoR
katie.ahearn@unh.edu

Jen Baker
EWD Program Coordinator
NH EPSCoR
jennifer.baker@unh.edu

Denise Blaha
Communications & Information Coordinator
NH EPSCoR
denise.blaha@unh.edu

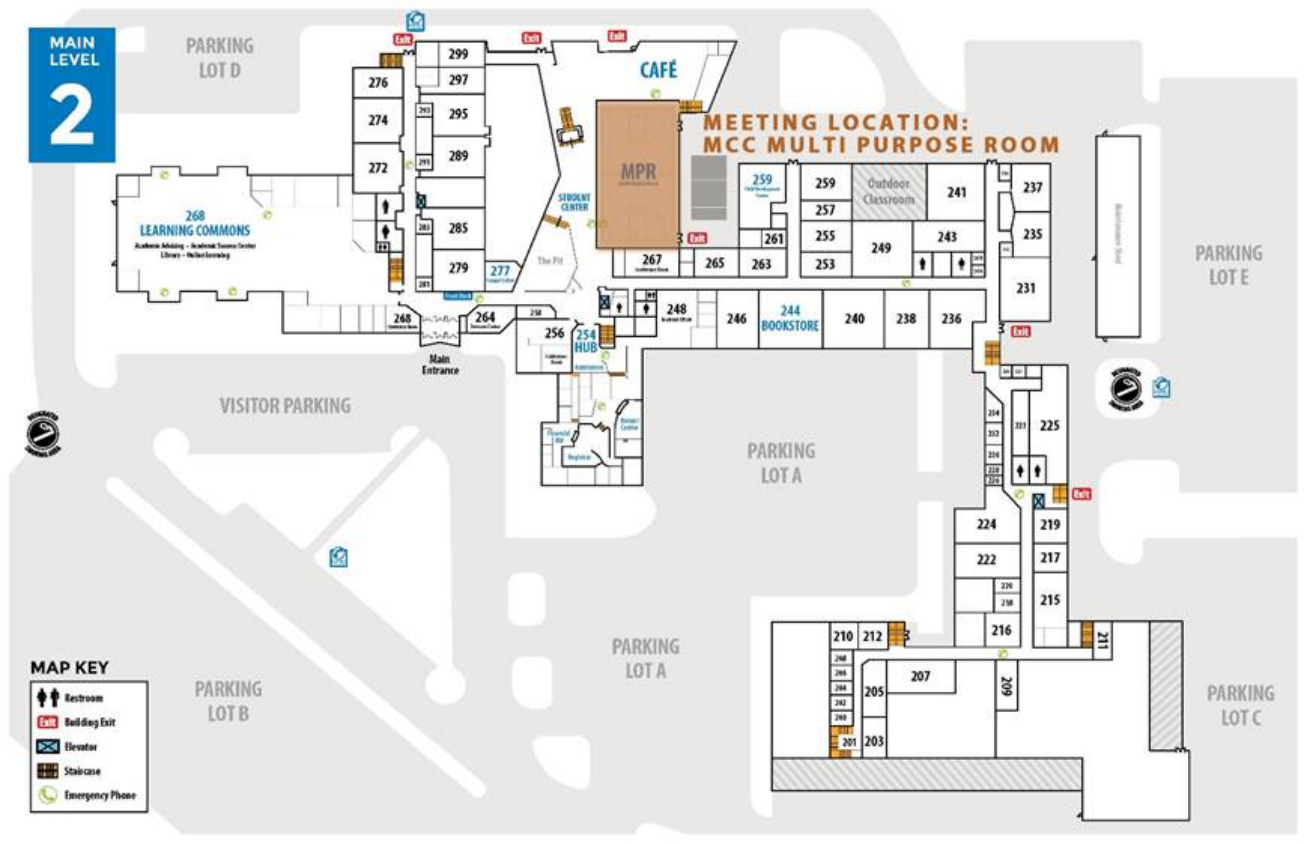
Michelle Gregoire
NH EPSCoR Program Manager
michelle.gregoire@unh.edu

Justine Stadler
Partnerships Director
NH EPSCoR
justine.stadler@unh.edu

Notes

Notes

Campus Map

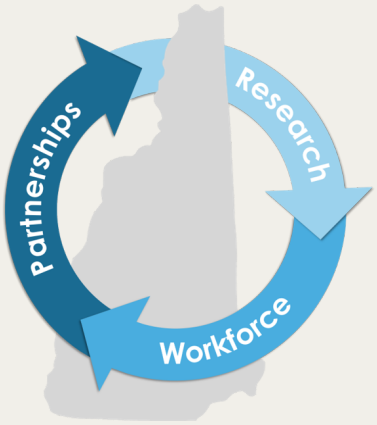

MAIN LEVEL 2
PARKING LOT D
CAFÉ
MEETING LOCATION:
MCC MULTI PURPOSE ROOM
MPR
STUDENT CENTER
268 LEARNING COMMONS
Outdoor Classroom
244 BOOKSTORE
254 HUB
Main Entrance
VISITOR PARKING
PARKING LOT A
PARKING LOT B
PARKING LOT C
PARKING LOT E
MAP KEY
Restroom
Building Exit
Elevator
Staircase
Emergency Phone

Acknowledgements

We are grateful to Manchester Community College for hosting the NH Biomaterials and Biomanufacturing Research Futures Retreat. Special thanks to Dr. Sadie Reed-Stimmell of Manchester Community College for providing logistics support & local recommendations essential to a successful meeting.

Support for this retreat is made possible by the National Science Foundation through by an award to the New Hampshire Center for Multiscale Modeling and Manufacturing of Biomaterials (NH BioMade), an NSF EPSCoR Research Infrastructure Improvement Track-1 project (#1757371)

NH BioMade
Advancing Biomaterials



Manchester Community College
MCCNH.EDU

EPSCoR
NEW HAMPSHIRE

NSF