1. Dixon Research Building

A. Building Description
The Dixon Research Building houses most of the equipment and space for cell, molecular and tissue research. Total assignable laboratory and office space is 12,085 square feet. In addition, a 2600 sq ft green house is attached to the building as is an auditorium (capacity?) used for teaching, meetings and presentations. Faculty in Physics, Chemistry and Biology are assigned laboratory and office space in Dixon. The office suite and conference room of the Dean of the School of Computer Science, Mathematics and Natural Science is located on the upper level of Dixon. Faculty offices are located adjacent to research laboratories.

Reverse osmosis deionized water is available in all laboratories. Two autoclaves are located on the second floor for use by all faculty and students. Wet and dry ice are readily available. Chemical fume hoods, eyewash stations and safety showers are present throughout the building.

B. Morgan State University’s Molecular and Cellular Biology Core
Director: James Wachira, PhD  james.wachira@morgan.edu
Manager: Elizabeth Rodriguez, PhD  elizabeth.rodriguez@morgan.edu

General Description:
Square Footage: 1464
Facility Location: Dixon Upper Level, rooms 204, 207, 215, 217, 218A/E, 223, 226
The NIGMS/BUILD Initiative and NMHD/RCMI supported Core Laboratory houses three microscopy and imaging rooms, a molecular biology instrumentation lab, a cold room, a dark room and a common user cell culture lab. Access to the facility is open to all MSU investigators and their collaborators.

URL: Morgan State University’s Molecular and Cellular Biology Core

Major Equipment
Molecular biology
1. MiSeq® integrated DNA and RNA sequencing system
2. ProteinSimple WES System. A fully automated quantitative micro-western blot system using ultra-fast, capillary electrophoresis to run 25 samples per 3 h run.
3. Luminex MagPix System. A multiplexing unit with magnetic bead technology runs 50 different tests in single reaction volume and reads 96-well-plate in 60 minutes.
5. GE Amersham 680R gel imaging system for DNA and protein gels capable of chemiluminescence and fluorescence in Western blots.
6. GE Healthcare Life Sciences Nanovue Plus spectrophotometer. Available for the measurement of nucleic acid and protein samples.
8. Bio-Tek Synergy H1MF is a hybrid multimode microplate reader with top and bottom fluorescence intensity, UV-visible absorbance, luminescence, fluorescence polarization, TRF & TR-FRET detection.
9. Centrifugation: Beckman-Coulter J25I high speed centrifuge (max. 25000xg and Beckman-Optima L-100XP ultracentrifuge (max 802,400g).
Tissue Preparation/Histology
1. PELCO Pella BioWavePro Microwave System: rapid processing of thin tissue sections for histological analysis
2. PELCO SteadyTemp™ Pro Solid-State Chiller with Digital Control- offers the unique ability to provide continuous temperature control from 4°C to 80°C
3. Leica CM1860 cryostat- immunohistochemistry and histology applications
4. Leica XXX paraffin embedding station this is in the darkroom bought with ASCEND
5. Leica XXX rotary microtome for paraffin this is in Dr. Hoffman’s lab bought with ASCEND.

Cell Culture
1. Dixon Room 218D is equipped with a Class II/Type B2 laminar flow hood that is suitable for microbiological studies involving BSL-2 agents.
2. A multi-user cell culture facility (Room 207) is equipped with CO2 incubators a Zeiss Axiovert 200 inverted microscope, a centrifuge, and a TC-20 automated cell counter.

Flow Cytometry
1. SONY SH800 cell sorter has the capacity to sort different cell sizes using microfluidics sorting chips. The sorter is equipped with 488nm/638nm/408nm lasers.
2. SONY SA3800 Spectral analyzer is equipped with 488nm, 405nm and 638nm lasers. The spectral unmixing technology allows for the efficient separation of spectra from different fluorochromes. As set up, 10 color phenotyping can be accomplished from a single experiment.

Biomedical Imaging
1. Two Nikon Eclipse TE2000-E inverted microscopes. One is equipped with motorized focus and nosepiece, BF, FL, Phase Contrast and Differential Interference Contrast (DIC) optics, Nikon 100W FL power supply and Nikon DXM 1200 Digital Camera. The second TE2000-E is equipped with BF, FL, Phase Contrast and DIC optics and a Photometrics CoolSnap ES digital camera.
2. Arcturus Inverted Microscope and Pixel Ile Laser capture system.
3. Nikon Eclipse 90i upright microscope equipped with BF, FL and DIC optics, motorized focus and Nikon 100W mercury power supply, a Lumenera 3 digital camera, Image Pro Plus image analysis software and Dell Optiplex 5040 workstation.

Molecular Separations and Identification
1. NGC Quest 10 Chromatography System has automated 10 ml/min pumps that provide accurate gradients for high-resolution separation of proteins and biomolecules and supports automated sample injection using fixed or dynamic loops.
2. Agilent 6546 Q-TOF LC/MS System with Agilent Jet Stream source, oil foreline pump, bundled PC, monitor, MassHunter software suite- at the low and high concentrations with simultaneous delivery of five orders of in-spectrum dynamic range and mass resolution over 60k (for high masses) and over 30k (for low masses)
3. Agilent 7800 ICP-MS enables analysis of major and trace analytes in a single run – The wide dynamic range orthogonal detector system (ODS) enables direct analysis of major elements (100s or 1000s of ppm) and trace level analytes (single or sub-ppt) in a single run.

Data Analysis
1. Dell Precision 7920 Towers, Intel Xeon Silver 4214 2.2GHz, 3.2GHz Turbo, 12C, 9.6GT/s 2UPI,16.5MB Cache, HT (85W) DDR4-2400 1st, NVIDIA Quadro P5000, 16GB,
4 DP, DL-DVI-D (7X20T), 256GB 4x64GB DDR4 2666MHz LRDIMM ECC Memory, 2.5”
1TB SATA Class 20 Solid State Drive.

2. Data analysis Software packages:
   a. Graphpad Prism
   b. Stata statistical software for data science

3. FLOWJO flow cytometry software.
4. DNASTAR Lasergene software for genomics and molecular biology.
5. Spartan computational chemistry software.

Services
1. Initial consultation and training on all laboratory instruments.
2. Assistance with experimental design.
3. Assistance with data analysis.
4. Assays will be performed upon request

C. Other Multi-User Equipment in or near the Dixon Research Building
1. Real Time PCR: MX3000P Real-Time PCR System. Multiplexing capabilities of 4 dyes in
   using a photomultiplier tube (PMT) detector. Dynamic range of 7 orders of magnitude.
   Excitation range of 350mm – 750mm and emission range: 350mm – 700mm.
2. Eppendorf Thermal Cycler: Accepts multiple 0.2ml and 0.5ml tubes and it can perform
   gradient amplifications. It is ideal for routine PCR and cloning experiments.
3. Allegra X-22R Centrifuge: Cooled bench-top centrifuge with rotors for microcentrifuge
   tubes, 15ml and 50ml tubes.
4. Electrophoresis: Various gel electrophoresis apparatus for nucleic acids and proteins
   including Ettan IPGphor II IEF System. A fully programmable integrated isoelectric
   focusing equipment capable of running up to 12 IPG strips (7, 11, 13, 18, or 24 cm)
   simultaneously. The system is cooled by a peltier platform and has an integral 8000V
   power supply.
5. Shaking Incubators (DI109 and DI207): Ideal for cell culture studies, cell aeration,
   bacterial aeration and metabolism studies. Accommodates multiple volumes of culture
   flasks and includes a static shelf for culture plates.
6. Sample concentrator (DI207): Vacufuge Concentrator for concentrating DNA/RNA,
   nucleotides, proteins and other samples in 96 x 1.5-2.0ml sample format. Automatic
   vacuum release prevents sample loss due to bumping and foaming.
7. Nuclear Magnetic Resonance Spectrophotometer (NMR) (DI108): 400 MHz Ultrasound
   NMR BRUKER Bio Spin.
8. Gas Chromatogram-Mass Spectrophotometers (GCMS) (Spencer Hall (SP) RMs 206
    and 313 and DI113): HP 6890 GCMS system, which includes: HP 6890 series GC
    system, HP 5973 Mass Selective Detector (MSD), and Agilent 7683 Series injector.
    Agilent 6890N network GCMS system, which includes: Agilent 6890N Network GC
    system, Agilent 5973 inert Mass Selective Detector (MSD), Agilent G188 Network Head
    Space Sampler, Agilent 7683 Series Auto sampler, and Agilent 7683B Series injector.
    Saturn 2200 GCMS system from Agilent Technologies (Varian) GCMS Qp50/50A
    system Shimadzu Scientific.
    /MSD System, which includes: Agilent 1100 LC /MSD, G1322A Online Vacuum
    Degasser, G1311A Quaternary Pump G1313A, Automatic Liquid Sampler G1316A
    Column Compartment, and G1315B Diode Array Detector
2. Animal Research Facility (ARF)

Director: Ingrid Tulloch, PhD  Ingrid.Tulloch@morgan.edu
Manager: Elizabeth Broussard  Elizabeth.Broussard@morgan.edu

A. General Description

The Animal Research Facility (ARF) was built in 2017 and includes a state-of-the-art vivarium and research facility. This research facility was built, staffed and equipped according to the standards of the American Association for Accreditation of Laboratory Animal Care (AAALAC). Faculty and students can perform laboratory animal studies in an innovative, ethical, and humane manner. Housing is available for rats and mice and aquarium space for crayfish is included.

Square Footage: 2725

The Facility Manager, Caretaker and Veterinarian are American Association for Laboratory Animal Science (AALAS) certified. All work performed in the facility is approved by the Morgan State University Institutional Animal Care and Use Committee and adheres to occupational Health and Safety guidelines. Any interested investigator is encouraged to access policies and procedures on the resources and training drive.

The ARF maintains compliance at all times with federal Animal Welfare Act requirements for laboratory animal care and use.

URL: Animal Research Facility (ARF)

B. Animal Housing Capacity

<table>
<thead>
<tr>
<th>Species</th>
<th>Animals Per Cage</th>
<th>Cages per Rack</th>
<th># of Racks</th>
<th># Animals</th>
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<tbody>
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<td>Rat individual ventilated housing in 2 rooms</td>
<td>2</td>
<td>30</td>
<td>12</td>
<td>720</td>
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<td>Mouse individual ventilated housing in 2 rooms</td>
<td>4</td>
<td>80</td>
<td>3</td>
<td>960</td>
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<td>Mouse individual biometric housing with 24 hour activity monitoring in 1 room</td>
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<td>60</td>
<td>1</td>
<td>60</td>
</tr>
<tr>
<td>Aquaria for housing fish in one room</td>
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<td>12</td>
<td>2</td>
<td>96</td>
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<tr>
<td>Total capacity</td>
<td></td>
<td></td>
<td></td>
<td>1836</td>
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C. Equipment and Apparatus
1. State-of-the-art surgery room with two surgery tables (one backdraft and one downdraft),
digitized stereotaxic instruments, gas and chemical anesthesia system, animal
physiological monitoring (Kent Scientific) and autoclave system for surgical sterilization.
2. Histology laboratory with biosafety level II cabinet, chemical fume hood for perfusions,
HistoCore Arcadia tissue processing and embedding apparatus and a Leica RM2255
fully automated rotary microtome.
3. Molecular laboratory with a Hacker Bright cryostat, a Keyence BZ-XB fluorescence
microscope with live cell imaging and automated cell counting capabilities, refrigerated
centrifuge, digital temperature shaking incubator, Wes™ Simple western blot protein
analysis apparatus, Molecular Devices Emax-Plus microplate reader and various small
laboratory items (e.g., vortex mixer, centrifuge etc.)
4. Three behavior testing rooms with various automated testing equipment that includes:
Automated operant conditioning chambers for fear conditioning and drug self-
administration, Light-dark boxes, and modular mazes, a Rotarod for mice and rats with
video recording capabilities. Equipment includes, Manual open-field, Elevated Plus and
a T-Maze for mice and rats, and a T-maze for small aquatic species.
5. Automated bedding dispenser and water filling station.
6. Cabinet cage washer with separate clean and dirty sides.
7. Reverse osmosis purification water system.
8. Dry ice maker.
9. Automated environmental monitoring system with twenty-four hour monitoring for rodent
circadian rhythm studies, with environmental temperature and humidity controls.
10. Three freezers (including an ultra-low temperature freezer) and 2 refrigerators for
sample storage.

D. Training and Consultation Services
The Facility Director, Manager or Veterinarian have over fifteen years of combined experience
working with laboratory animal in research, teaching, and facility operations. The Veterinarian,
Facility Manager and Animal Caretaker are all AALAS certified in various animal care and use
operations. Training or consultations provided are as follows:
- Health and safety training workshops semi-annually and by appointment
- Basic rodent handling, animal care and health monitoring training by appointment
- Consultations for laboratory animal research design and IACUC protocol writing by
appointment.
- Individualized training for specialized surgical and behavioral techniques or other
technical procedures are available by appointment.
3. Morgan State University’s Biostatistics and Bioinformatics Support Unit (BBSU)

Director: Mian B. Hossain, PhD  Mian.Hossain@morgan.edu

A. General Description

Located in the Portage Building on Cold Spring Lane, the BSSU provides space, software, computers and research statistical analysis services to Morgan students and faculty.

URL: Morgan State University’s Biostatistics and Bioinformatics Support Unit (BBSU)
B. Computational Resources
1. Dell Precision 7920 Towers, Intel Xeon Silver 4214 2.2GHz, 3.2GHz Turbo, 12C, 9.6GT/s 2UPI, 16.5MB Cache, HT (85W) DDR4-2400 1st, NVIDIA Quadro P5000, 16GB, 4 DP, DL-DVI-D (7X20T), 256GB 4x64GB DDR4 2666MHz LRDIMM ECC Memory, 2.5” 1TB SATA Class 20 Solid State Drive.
2. STATA statistical software for data science
3. Portage building has a computer lab with 22 Dell desktop computers. The installed statistical packages include:
   a. SAS 9.4
   b. STATA 14.2
   c. SPSS 24.0
   d. ATLAS.ti 8.0. (Qualitative data analysis software)

C. Services
- Provide assistance in designing the analytical portion of studies.
- Provide assistance with data analysis.
- Provide assistance with sample size determination of studies.
- Conduct Summer Institute on biostatistical methods, data analysis, and bioinformatics.
- Conduct Training on R statistical software.
- Conduct Training on STATA statistical software.