**Facilities and Other Resources**

**Overview**

The University of North Carolina at Greensboro (UNCG) is an active research university, classified by the Carnegie Foundation as a high productivity research university. In that position, UNCG supplies a strong set of facilities for both instructional and research activities. The facilities and other resources available to the students include everything needed to undertake and complete the proposed research projects successfully. The intellectual environment at UNCG is rich with externally funded investigators who are doing work that will provide outstanding research experiences for the MARC U-STAR fellows. *These facilities collectively provide a scientific environment that is strongly supportive of the proposed research involving undergraduate and graduate students and, therefore, success of the project.*

**Animal facilities**

UNCG houses a state-of-the-art animal facilities.  The facility has a single corridor floor plan.  The one corridor serves as both the dirty and clean corridor.  The facility has an emergency generator which provides limited electricity when normal power is lost.  All animal rooms are equipped with day/night light cycles and appropriate HVAC systems.

Rodents can be housed in cages in a dedicated room located in the Stone animal facility, which is in the basement of the Stone Building. This facility is operated under the guidance of UNCG’s IACUC. UNCG’sanimal care program has approved assurance from the Office of Laboratory Animal Welfare, NIH-PHS (#A3706-01). The Eberhart Facility has twelve animal housing rooms for active protocols, eight surgery/procedure rooms for temporary assignment to individual investigators, dirty and clean cage rooms connected by a cage washer, and a food and bedding storage room.  The surgery/procedure rooms have several configurations and include a necropsy/euthanasia room, an autoclave room, minor procedure room with fume hood, and a surgical suite. Total square footage is 7,785 square feet.

**Magnetic Resonance Imaging (MRI) Facility**

This facility is available to researchers on the UNCG campus. Itislocated at UNCG’s Gateway University Research Park in the Joint School of Nanoscience and Nanoengineering, within a 10 minute drive from the main campus*.* The MRI is a 3T MAGNETOM Trio A Tim System (Siemens Medical Solutions, USA) equipped with a high resolution knee coil that is exclusively used for research purposes. The facility includes a waiting room, gowning room, small exam room, and a work room for MRI technicians and faculty researchers.

**Biology Department**

The UNCG Biology Department is housed in the Eberhart and Sullivan Science buildings, and provides sufficient office and research space for faculty and students. Most researchers are provided with individual labs of approximately 1200 sq. ft. of work space containing all of the basic equipment required for the proposed studies. The laboratories possess standard facilities such as work benches, sinks, and gas outlets. In addition, many of the laboratories are equipped with Beckman DU-800 UV-Vis spectrophotometer, Oxygen Measuring Systems for Cell Respiration, fluorometer, microplate reader, PCR systems, immunohistochemistry facility for routine staining, Fisher Scientific Refrigerated 515 R and 5810 R centrifuges; water baths, stirrer/hot plates, electrophoresis systems, regular centrifuges, water purification systems, Nitrogen Gas cell storage tanks, pH meter, analytical balances, one fume hood and many other standard lab equipment items. Some laboratories also contain a 150 sq. ft. cell/tissue culture room, equipped with a cell/tissue culture hood, and EVOS xl (phase-contrast imaging, Nikon Eclipse TS100/TS100F Inverted Microscope, and CO2 incubator.

Faculty research at biology department is supported further by the presence of core facilities available for use by researchers. Such core equipment includes: Multi-channel microplate reader; luminometer; Phosphorimager; BioTek Microplate Reader; Spectrophotometers; Darkroom facilities; Scintillation counter; Fluorometers; Twelve PCR thermocyclers. Real-Time PCR Thermocyclers; Flow cytometer; Gel Documentation systems; On-site molecular biology supply store: Reagents and kits; Tissue Culture Facility - six NUAIRE™ Biological safety cabinets (Class II, Type A/B3); Biorad (GenePulser II) cell electroporation apparatus; Table-top and Incubator Shakers ; Microtome and Histology facilities; Probe and bath sonicators, tissue homogenizers; Two Beckman J2-21 centrifuge with J2-21 and JA-14 rotors ; Beckman TL100 Refrigerated Ultracentrifuge with a TLA100.2 rotor; Low-speed refrigerated centrifuges; Gel electrophoresis equipment for performing both one- and two-dimensional polyacrylamide gel electrophoresis, as well as immunoblotting; Guava easyCyte Flow Cytometer; Confocal Olympus IX70 inverted microscope equipped with phase contrast and fluorescence imaging capabilities; Scanning electron microscope; Prior Scientific ProScan™ Motorized Stage including Software integrated Stage Mapping; Three broad temperature-range environmental rooms; Biorad Molecular Imager ChemiDoc XRS System; Dedicated Radioactivity Room; Autoclaves; [Sequencing & Genotyping](http://www.uncg.edu/bio/facilities/sequencing) (Thermalcyclers, MegaBACE 500 DNA and Genotyping Analysis System, Analysis Software) ; Micromanipulators and Autoclaves.

**Chemistry & Biochemistry Department**

The general chemistry and biochemistry instructional facilities are located on the second floor of the Sullivan Science Building at the University of North Carolina at Greensboro, a state-of-the-art facility completed in 2003 that includes over 172,000 square feet of research and teaching space. The General Chemistry and Biochemistry Laboratory facilities at UNCG consist of four laboratory rooms of 1200 square feet with design capacity of 24 students each. Each room contains 12 two-person work stations inside of full ventilation hoods designed for 100% exhaust. Community workbenches provide another 50 linear feet of work area. Twelve computer workstations with extensive experimental probeware (temperature, pH, conductivity, voltage, radiation monitor, and spectrometers) are available at the student work stations in each room. The computers are supported by a central server and printing systems. The lab facilities are supported by three prep/storage rooms with 700 square feet of storage and work space. Adjacent classrooms of 24 or 48 seat capacity are available for prelab discussion.

# Human Development and Family Studies Department

# The Family Observation Roomis a suite of 3 adjacent rooms, including the project office/technology room, a large center playroom used for mother-infant observation, and a smaller room for the interviews. This space is used to conduct the 6 month laboratory visits and will be used to collect saliva samples from mothers and infants who opt to do the on campus data collection rather than home. Each room is appropriately furnished.

The Behavioral Research Facility (BRF), located in the same building, consists of 3 paired observation/ interview rooms. All observation rooms are equipped with digital video cameras that are wall-mounted and hidden microphones. The BRF also includes a survey facility containing five workstations for transcribing interviews, coding interviews and behavioral observations, and entering data that will be available for the proposed project. A combined TV/VCR and digital audio recorder with microphone are located in each interview room for the video- based interviews. Eight digital transcription machines with software are dedicated to the project. A large room with 9 workstations and working phone located adjacent to the BRF serves as a project office. It is fully furnished, equipped with secure filing cabinets and a locked storage closet. This room has ample office space for the full-time project staff, graduate RAs, and postdoctoral fellows.

The laboratory spaces are equipped with networked computers with MPEG encoders for recording digital media files and for downloading all audio and physiological data files from devices. The project office is equipped with 10 networked computers and 2 high quality networked printers. Software includes Mangold Interact for use in behavioral coding, 3991x-GPP DPS Software for use in downloading heart rate and SCL data. The most recent versions of Porges’ CardioBatch and CardioEdit for editing and scoring heart rate data are loaded on project computers

**The Joint School of Nanoscience and Nanoengineering (JSNN)**

JSNN was formed as a collaborative project of North Carolina A&T State University and The University of North Carolina at Greensboro. The JSNN’s research and educational programs focus on Nanoscience and Nanoengineering. The strengths of the two universities in the basic sciences and in engineering make them ideal partners for this new interdisciplinary school. The JSNN is located at the South Campus of Gateway University Research Park, another major joint collaboration between the two universities. The JSNN is housed in a state of the art 105,000 square foot facility, which features extensive labs and clean rooms. Gateway University Research Park and JSNN have partnered with leading manufacturers of tools that are critical to exploring the frontiers of Nanoscience and Nanoengineering. JSNN faculty and students have access to a sophisticated suite of tools including the only Carl Zeiss Helium Ion Microscope in the southeast. The intent of the Chancellors is to create a school focused on developing leading edge applications in the hottest emerging technologies. They housed the JSNN in Gateway University Research Park with the intent of providing an environment conducive to commercialization of university developed intellectual properties and to create a space where industry/academic collaborations will happen.

JSNN offers Masters and Doctoral degrees in both Nanoscience and Nanotechnology. Through these degrees, the mission of the Nanoschool is to train students to conduct basic and applied research in nanoscience and nanoengineering, and to work closely with the Piedmont Triad community to help enhance opportunities for economic and academic growth through its outreach and engagement activities. The facilities at the JSNN provide an ideal teaming environment to facilitate interdisciplinary research in areas of genomics, nanbioelectronics, nanobiology including nanopharmacology, nanomaterials and nanocomputing. This equipment includes instruments for analytical chemistry, biophysics, clean room, magnetic resonance imaging, material testing, and nanofabrication. The genomics laboratory is a fully equipped molecular biology laboratory that includes an Illumina MiSeq desktop sequencer and a Illumina Neo-Prep for preparation of genomic libraries. A full listing of JSNN equipment is provided at jsnn.ncat.uncg.edu/facility/equipment.

**Kinesiology Department**

The Applied Neuromechanics Research Laboratory serves as the primary research laboratory for faculty and graduate students in the master’s and doctoral degree programs in Sports Medicine, Applied Neuromechanics and Motor Behavior. The laboratory includes state of the art instrumentation for assessment of strength, lower extremity alignment, joint laxity, and biomechanics. Strength testing equipment, capable of assessing muscle performance in isokinetic and isometric modes, includes the Biodex System 3 isokinetic dynamometer (Biodex Medical Systems Inc.; Shirley, NY). Measurement of lower extremity alignment is made possible with a wide assortment of goniometers, rulers, calipers, and inclinometers. Instrumented joint laxity / stiffness testing is performed with a KT-2000TM (MedMetric Corp, San Diego, CA) that permits readout of continuous force and displacement from a digital diode, and the Vermont Knee Laxity Device that is interfaced with our motion analysis system to measure anterior tibial translation during the transition from non-weight bearing to weight bearing, and frontal and transverse plane rotational knee laxity and stiffness during controlled, externally applied loads. Lower extremity biomechanics are assessed with two Bertec non-conducting force platforms (Bertec Corporation, Columbus, OH) to collect ground reaction force data, and which are interfaced with an 8-camera active optical motion capture system (Phase Space, San Leandro CA) and software (Motion Monitor, Innovative Sports Training, Chicago IL) to collect kinematic and kinetic data during dynamic tasks. The non-tethered nature of this equipment allows serial biomechanical measurements during the course of an exercise protocol without the need for re-digitization. A 16-Channel Myopac surface EMG unit (Run Technologies; Laguna, CA), an 8-channel Therapeutics Unlimited Surface EMG unit, and 3-channel HP mechanomyography are available for neuromuscular assessments. Additional data acquisition and analyses software currently available include [Medical Image Processing, Analysis and Visualization](http://mipav.cit.nih.gov/) (MIPAV), and Data-Pac 2002, MatLab and LabView Lab application software programs which can be interfaced with all laboratory equipment to allow collection of a total of 16 analog data channels simultaneously, including EMG, footswitch, force plate and electrogoniometer measurements.

The Applied Neuromechanics Research Laboratory is equipped with 3 P.C. data workstations with external analog to digital collection boards, 5 P.C. data analysis workstations networked to a University server, and numerous software programs. All PC workstations within the computer laboratory are networked together via the University Ethernet network which provides access to MatLab, SPSS and SAS software, among others. A portable laptop, equipped with a 16-channel BNC box and A/D card, is available for data collection and analyses in the field.

The Exercise Biochemistry Laboratory adjoins the Applied Neuromechanics Research Laboratory, where blood samples are collected, processed and stored. This laboratory is equipped with the following instruments and capabilities: fume hood, refrigerator centrifuge, Fluorimeter, Chemiluminometer, Spectrophotometer, water bath incubator, water purification system, microplate readers, washers and shakers, assorted pippeting devices for microliter samples, and numerous reagents and chemicals and high-performance liquid chromatography (HPLC). *The laboratories are supported by a full time university computer technologist II, who allocates 50% of his workload to provide technical and computer support to the Kinesiology Laboratories and Offices.*

**Nutrition Department**

There are approximately 2000 square feet of lab space in four rooms in the Stone Bldg, including a cell culture and molecular biology facility (Dickson/Harris Teeter Cellular and Molecular Nutrition Laboratory). The laboratories were designed as a community environment where up to three investigators and their research teams share common rooms. Each team has their own assigned lab bench space and all of the major pieces of equipment are shared. This open environment fosters communication between groups and also makes efficient use of expensive equipment. Three other rooms in the Stone Building have approximately 1500 square feet of lab space. These labs are equipped with the following minor equipment costing: a YSI oxygen monitor, chamber and recorder, non-refrigerated and refrigerated Eppendorf microcentrifuges**,** a Misonix Biodisrupter, aSavant speedvac concentrator, aKonica SRX-101A X-ray film developer, a Thermolyne biological liquid nitrogen storage system, AB Geneamp thermocyclers,shaker hot water baths**,** analytical and precision balances, polytrons, probe sonicators**,** regular and chromatography refrigerators, -20oC and -70oC freezers, electrophoresis power supplies and chambers, transfer rigs, platform shakers and slot and dot blotters. *The laboratories are supported by two full time research technicians who work with researchers and their students.*

The facilities for faculty and students engaged in translational nutrition research are located in the Cemala Foundation Human Nutrition Research Laboratories. These labs are located in the Nutrition Department in the Stone Building. The first suite includes a separate Dietary Assessment Room for housing a computer dedicated for the Nutrition Data System for Research software program. The room contains a desk, two chairs, a phone for calling participants, and locked file cabinets to store data. Adjoining the Dietary Assessment Room is another room of desk space with computers for six students to use for data entry, data analysis, manuscript writing, power point presentations and other research work. Locked file cabinets for data storage are also available in this room. The third room in this suite contains a small kitchen and a large table that may be used for small nutrition education classes, focus groups, lab group meetings or other research work. This suite of rooms is approximately 900 square feet.

Across the hall is the second suite, the Human Nutrition Assessment Laboratory, approximately 1100 square feet. This suite contains a restroom; a second room for blood draws and anthropometric measurements; a third room to measure body composition, cardiovascular fitness, and strength testing; and a fourth room with a dual energy X-ray absorptiometry machine to measure bone mineral density and body composition. Desk space and computers are available for four students.

**Psychology Department**

The Department of Psychology includes the following faculty mentor research labs:

The Developmental Psychobiology lab has 6 rooms with 12 Lenovo computers for video coding and data analysis linked with an intranet to a separate server. The lab has seven keys for using Noldus Observer 10.5 for coding and the computers have access to the most modern SPSS, SAS, R and M-Plus statistical programs.

The Cognitive Psychology lab consists of one large group testing room (for up to 6 participants, each at a separate computer workstation) and two individual testing rooms (each with one computer workstation). The lab rooms are located in the Department of Psychology; all are locked and secure when not in use. The lab has 8 Dell PCs dedicated to behavioral data collection for various projects, and 4 additional networked computers in a separate room for data analysis.

The Social Psychology lab includes a large room for group-based data collection and two small rooms for running individuals or small groups. All rooms contain desktop and laptop PCs, laser printers, software for data collection (MediaLab & DirectRT), and high-speed keyboards and response pads for precise response-time data acquisition. The rooms are partitioned so that data can be collected from several computers at a time if desired. One room contains locked cabinets for storing data and research material. The lab rooms are locked and secure when not in use. One of the dedicated lab rooms is devoted to conducting psychophysiological studies. It is equipped with a Mindware BioNex chassis for collecting impedance cardiography and skin conductance data as well as the related Mindware suite of software (BioLab, HRV, IMP, EDA, and Compiler) for screening, editing, analyzing, and compiling the data. For ambulatory research, it contains a Mindware ambulatory impedance cardiography device, which is capable of collecting up to 24-hours of signals that can be transmitted wirelessly or saved to a local SD card.

The Cognitive Development lab includes space for greeting families, three functional testing rooms (including two that are connected via a 1-way mirror for observation), coding facilities, and office space for project staff and graduate students. In addition, the department offers common space for staff meetings and a child friendly room for the babysitting of siblings. Two high-volume copiers are available in the department for making participant survey packets, and ample space is available for assembling the packets before mailing. The lab has 5 desktop computers and 2 laptops (including one with touch-screen capabilities).

The Developmental Psychopathology lab includes five rooms of varying sizes, three desktop computers and two laptop computers.

In addition to the faculty mentor labs described above, the Department of Psychology has a departmental ERP (Event Related Potentials) lab that is available for use by all faculty. The Department of Psychology offers 8 reserved parking spots for participants who visit from off-campus.

**Public Health Education Department**

The Department of Public Health Education, a unit in the School of Health and Human Sciences (HHS), is an institutional member of the Association of Teachers of Preventive Medicine. The department has many tenure track faculty members with active research programs to support the department's bachelor's program in Community Health Education, its CEPH-accredited MPH program in Community Health Education, and its doctoral (PhD) program. All offices are fully equipped with computer support and networking capabilities. The computer system has multiple statistical packages including SAS, SPSS, Atlas.ti and JMP to help analyze the data. Information on the network server is backed up daily and stored in a secure off-site location. Proper environment controls, temperature, humidity and fire protection, are maintained at the storage location.

**UNCG Library**

The Jackson Library is housed in a modern 10-story building with shelving capacity for more than one million books, seating capacity of 2,400, carrels for graduate students, faculty studies, microcomputer classroom/labs and seminar rooms. Holdings number over 2.3 million items, including 600,000 federal and state documents and 820,000 items in microtext. The library subscribes to approximately 5,500 newspapers, periodicals and other serials. The Electronic CITI and Superlab provide more than 150 machines for general-use computing by current UNCG faculty, staff, and students. The Library also contains about 75 JACLIN Plus machines, which provide access to the Library's catalog, as well as electronic databases and full text resources. Through a cooperative lending agreement with the other fifteen campuses of the university of North Carolina system, and with Duke University, faculty members and graduate students borrow books from the libraries of those institutions. An online catalog of the holdings of the 16 UNC libraries and Duke University became operational in 1989.

**UNCG Information technology.**

The UNCG integrated computing system offers unlimited opportunities for communication on campus and throughout the world. The academic computing environment consists of a SUN Solaris AFS based installation to host an Apache/PHP web, UNIX application hosting with file space and a research environment. Centrally-managed software available to all campus researchers includes a variety of statistical and mathematical analysis programs, such as SAS, SPSS, AMOS, Stata, Matlab, Maple and Mathematica; and qualitative research packages including Atlas.ti and QSR Nvivo. Data and reference management tools such as Microsoft Access and EndNote are also available. The technology infrastructure at UNCG is developed and maintained by a highly qualified team of certified systems, networks, database and infrastructure engineers. UNCG technology Infrastructure and services are monitored centrally by a Service Operations Center that is fully staffed 24x7x365. ITS also maintains a professionally staffed Service Desk that provides a vast array of critical technical support services to the University’s faculty, staff and students, including an online, web-based Self- Service Portal where all members of the faculty, staff, and student community can access support for technical needs 24 hours per day/7 days per week.

UNCG has extensive video teleconferencing capabilities, as an "extension site" on the North Carolina Research and Education Network (NCREN). The NCREN Video Network is a multi-site, multi-channel, interactive network connecting more than nineteen universities, medical schools, and research organizations. UNCG reaches the NCREN via H.323 "video over IP," using a Sony Ipela PCS G50 Video Communications System, and a Polycom VS-4000 Videoconference Unit for standard definition quality. A Polycom HDX 9002 unit is utilized for high definition video conferencing. Each of these units deliver low-latency, broadcast-quality video over IP/Ethernet networks. The Center's services include video and teleconferencing with schools and organizations beyond the NCREN network, high-quality audio-only conferencing, webinars, and event recording.