Facilities and Other Resources

Milken Institute School of Public Health
George Washington University, Washington, DC

Laboratory:
Central to GW’s research investment is the recently completed Science and Engineering Hall (SEH). SEH meets the needs of the university's growing research portfolio and serves as a hub for discovery, providing opportunities for cross-disciplinary collaboration. SEH's unparalleled location and state-of-the-art facilities enable students and faculty to strengthen existing partnerships and forge ties with influential scientific and technical organizations. SEH exemplifies GW's long-term commitment to educate the next generation of innovators, as well as support our faculty as they develop knowledge that will help improve the lives of millions worldwide.

The building includes functions from the Milken Institute School of Public Health, the School of Engineering and Applied Science, as well as the Columbian College of Arts and Sciences’ physical science departments. The Milken Institute School of Public Health floor contains 15,260 square feet of lab space, a 1,700 square foot teaching lab in addition to a 1,000 square foot multifunctional interactive 30-seat classroom, 3 conference rooms, 90 cubicles for lab researchers and post doc staff and 26 faculty offices. The labs support diverse research projects in the school including virology, bacteriology, environmental and occupational health, analytical chemistry, and toxicology.

The floor is also home to the Computational Biology Institute (CBI) and the Antibiotic Resistance Action Center (ARAC). In addition to specialized equipment within the large labs, there will be a 1,200 square foot BSL 3 laboratory and a DNA sequencing core.

The Milken Institute SPH floor incudes a centrally located 576 sq ft freezer farm that contains 15 ultra-low temperature (ULT) freezers. All of the ULT freezers are on an ElPro central monitoring system, which measures, records, and manages temperature data for each unit. In the event of a temperature deviation, users are notified via email and text message. Temperature data can also be viewed remotely by logging into the ElPro monitoring system. In addition, the School has a CryoPro liquid nitrogen dewar, equipped with a low level liquid alarm, that can store 875 (2 ml) vials.

The building was designed with collaboration in mind. Each floor has shared common areas outside the labs where there are also banks of workstations. A spiral staircase links the public health floor with the medical floor encouraging workflow between the two schools.

The Exercise and Nutrition Sciences department has two fitness testing facilities, one located in Washington DC near the Foggy Bottom campus (DC Lab) and one in Ashburn Virginia on the Virginia Science and Technology Campus (VTSC Lab). Both labs offer top-of-the-line exercise and clinical equipment for body composition, weight-loss and fitness testing. See more at: http://publichealth.gwu.edu/departments/exercise-and-nutrition-sciences/lab-facilities#sthash.UqKeGl0U.dpuf

Clinical: N/A

Animal: N/A

Computer:
GWU is well connected to research and educational communities. The wireless access service, Eduroam, is a secure, worldwide roaming access service developed for the international research and education community. It allows users from member institutions to connect to the Internet when visiting other participating institutions. GWU is also part of the Internet2Network, which is a computer networking consortium led by members from research and education communities, industry and government. It gives our researchers the ability to use
ultra-high-speed networking speeds when working with large dataset transfers that are used in much of our current research.

The Milken Institute SPH's hardware offerings include Window PCs and Mac workstations, dedicated research application and file servers as well as printers, FAX machines, high-speed photo copiers, overhead and data show projectors. Access to these resources is via high speed wired and wireless network links. There are dedicated resources for data storage, data transfer and sharing and data backup and redundancy.

The software offerings at Milken Institute SPH are also comprehensive. Our capabilities will allow for any required references retrieval, any other data retrieval or exchange, and online databases access. All faculty, staff, and students have access to electronic mail and collaboration software. Milken Institute SPH faculty and staff members also have access to licenses that include an extensive range of word processing, analytic, graphics, mapping, and presentation software such as, SPSS, Stata, SAS, Atlas.Ti, MPlus, Adobe Creative Suite, Nvivo, Qualtics, and ArcGIS.

StrongBox is a customized applications and data storage system that supports research and applied research instruction of Milken Institute School of Public Health faculty and their graduate students and post-docs. Researchers use the system to (a) store and preserve their research data for future research and “training” sets for students; (b) work with both small and large-scale research datasets, and (c) collaborate more effectively on research with colleagues and students across schools and departments.

Specifications:
- (2) 128GB RAM, dual Intel Xeon E5-2650 2.00GHz, 20M Cache, 8.0GT/s QPI, Turbo, 8C processors servers, (1) 36T SAN Storage
- Number of software packages - 10
- Type of interface - VPN and Onsite network access
- Number of registered users - 150

Office:
Each faculty member has a 10x11 sq. ft. furnished office equipped with computers, phones, and all the requisite office functionalities.

Other: CORE FACILITIES
Colonial One is housed on the Virginia Science and Technology Campus in one of GW's two enterprise-class data centers and features the following:
- Professional IT Management by the University’s central Division of IT, including 24-hour on-premise and remote environment monitoring with hourly staff walkthroughs.
- Redundant power distribution to include UPS (battery) and generator backup.
- Redundant cooling systems utilizing a dedicated chilled water plant and a glycol refrigeration system.
- Direct network connectivity to the University’s robust 100 Gbps fiber optic network.

Compute and Interconnect Capacity
Colonial One’s initial compute capacity features a total of 2,924 CPU cores and 1132,288 CUDA cores in these compute node configurations:
- 64 standard CPU nodes featuring dual Intel Xeon E5-2670 2.6GHz 8-core processors with varying ranges of RAM capacity (64GB, 128GB, and 256GB nodes) and dual on-board solid state hard drives
- 79 CPU nodes featuring dual Intel Xeon E5-2650v2 2.6 GHz 8-core processors with 128 GB of RAM each
- 32 GPU nodes featuring dual Intel Xeon E-2620 2.0GHz 6-core processors with dual NVIDIA K20 GPUs and 128 GB of RAM
- 1 large-memory node featuring four Intel Xeon E7-8857v2 3.0 GHz 12-core processors with 2 TB of RAM
- FDR InfiniBand network interconnect featuring 54.5 Gbps total throughput, with 2:1 oversubscription per compute node.

Storage Systems
The Colonial One cluster has both a primary storage system and a high-speed scratch storage system connected to the Infiniband network fabric. Both are accessible throughout the entire cluster, and remote file transfer services are provided through dedicated login nodes. Additional specifications include:

- Dell NSS primary storage with 120 TB of usable capacity
- Dell/Terascal Lustre HSS high-speed scratch storage with 250 TB of usable capacity

**FRESCO**

FRESCO is a high performance virtual environment that provides virtual machines with direct access to a 100GB network infrastructure. It is integrated with the high performance high capacity cluster, Colonial One, located on the GW Virginia Science and Technology Campus (VSTC).

**Biostatistics and Epidemiology Consulting Service (BECs):** BECS is embedded in the Milken Institute SPH Department of Epidemiology and Biostatistics and provides biostatistical, epidemiological, and study design support for health-related research projects. The BECS is directed toward providing for statistical needs of small- to medium-sized observational, epidemiological, and laboratory studies as well as small clinical trials. Priority services of the BECS are: pre-award consultation on best practices for biostatistical methods, sample size selection, and study design for health-related grant proposals, and pre-award statistical analysis assistance (by faculty and/or graduate students in biostatistics and epidemiology) of preliminary data to support a grant application.

**Sequencing Core Facility:** The George Washington University School of Public Health Next Gen Sequencing (NGS) Core provides Illumina high-throughput sequencing on the MiSeq and NextSeq instruments. Additional sequencing-related services to be offered by the Core will include: initial consultation, library preparation and validation, sample QC, sequencing, data retrieval and processing. NGS applications include DNA Seq (Whole genome sequencing, exome capture and ChiP sequencing) as well as RNA Seq (Whole transcriptome with rRNA depletion and Transcriptome sequencing with polyA pull down).

**OTHER RESOURCES:**

**Library Facilities:** The George Washington University’s extensive library collections are housed in the Melvin Gelman Library, the general academic library (http://library.gwu.edu/), the Jacob Burns Law Library (http://www.law.gwu.edu/Library/Pages/Default.aspx), and the Paul Himmelfarb Health Sciences Library (http://himmelfarb.gwu.edu/). These collections contain over 2 million volumes and over 20,000 serials and provide an extensive collection of general and specific volumes, periodicals, and papers in health services administration, health policy, business, medical care, economics, operations research, law, human resources management, statistics, and basic sciences. All are important to the Milken Institute School of Public Health and are readily accessible to students and faculty.

The Himmelfarb Health Sciences Library, the primary library for the Milken Institute School of Public Health, is located in Ross Hall on the Foggy Bottom campus one block from the Milken Institute SPH’s building and also serves the School of Medicine and Health Sciences and School of Nursing. The Library currently provides electronic access to over 3,500 textbooks, 4,000 journals, and 115 databases. Himmelfarb provides extensive on-site access to online, print and audiovisual collections, as well as access to computers and study areas. The Library's print collections include approximately 100,000 volumes and access to extensive journal backfiles. Over the past two years, monographic holdings in public health subject areas were extensively reviewed and expanded. The Library’s Bloedorn Technology houses more than 400 current DVD and CD titles as well as applications software for word processing, publishing, spreadsheets, databases, and reference management and dozens of specialized software titles focused on medicine, the health sciences, public health, and statistical analysis. Key health sciences databases include MEDLINE, SCOPUS, Global Health, and Health Policy Reference Center. Students also have access to major interdisciplinary databases such as Business Source Complete, ABI/Inform Complete, and Academic Search Premier. The Library provides electronic journals directly from publishers or through vendors such as ABI/Inform, Clinical Key, Ovid, and LexisNexis.

**Meeting and Conference Facilities:** The Milken Institute School of Public Health’s Platinum-certification as a Leadership in Energy and Environmental Design (LEED) building features more than 115,000 square feet of floor space for state-of-the-art classrooms, research labs, departmental offices, and conference rooms. The
first floor features an auditorium seating 227 people, a convening center with four connecting rooms, and a pre-conference space for receptions. In addition, the building includes two large 90-seat lecture classrooms, a 75-seat executive case room (featuring computer plug-in capacity and tiered audio-equipped seating), 14 classrooms seating 20-50 students each, and seven conference rooms for use by faculty. All of these amenities are intended to serve as a venue for continued research and collaboration with a wide variety of government and non-governmental organizations.

The University campus provides several large auditoriums, meeting rooms, and access to hotels for our school to host meetings and conferences. The GW School of Media and Public Affairs building features a 258-seat auditorium designed to attract media events and a modern newsmaker studio for faculty members to hold media interviews. In addition, the building is equipped with a fiber optic network, Internet access, and a teleconferencing classroom. State-of-the-art technology is also found in the Media Center, which is equipped for print, broadcast, and on-line media projects. The Cloyd Heck Marvin Center is the George Washington University’s campus community center, regularly used by Milken Institute SPH faculty and staff for meetings and events.

Scientific Environment

The George Washington University is at a critical juncture, having evolved into one of the nation’s leading universities. George Washington University completed a comprehensive strategic planning initiative that was captured in its Vision 2021 report. With 80 chartered centers and institutes and cutting-edge research in science and technology, health, public policy, global security, and the arts and humanities, research and innovation are driving forces at GW. In fiscal year 2015, GW's total research expenditures were $241 million.

The mission of GW’s Office of the Vice President for Research (OVPR) is to increase research through proactive activities that lead to extramural funding, promote the highest standards of ethical research and scholarly conduct, and elevate GW's stature as an institution of research excellence. OVPR's Research Enhancement Unit (REU) helps to build collaborative interdisciplinary research teams, assists with proposal development for large multi-investigator program project and center grants, and develops research infrastructure by facilitating dialogue among investigators across disciplines. The unit also provides educational development seminars and workshops for early stage investigators.

Milken Institute School of Public Health is a magnet for top scholars and a catalyst for the study and advancement of a wide spectrum of community, social, and scientific public health initiatives. Tenured and tenure-accruing SPH faculty are hired after national searches and additional faculty recruitments are ongoing. Departments are engaged in cutting-edge research, partnering with prestigious institutes and foundations. To help guide our research, we have research centers and programs that focus on key areas of domestic and global health, including the Center for Health Policy Research, the Health Workforce Research Institute, the Jacobs Institute for Women's Health, the Geiger Gibson Program in Community Health, the Hirsh Health Law Program and the Global Health Security Program.

As a multi and transdisciplinary institution, cross school collaborations are ongoing within all of our six academic departments, which include Environmental and Occupational Health, Epidemiology and Biostatistics, Exercise and Nutrition Sciences, Global Health, and Health Policy and Management. The multidisciplinary ethic of the school extends to the rest of the campus as embodied by numerous collaborations with colleagues in our medical, nursing, public policy, law and business schools.

Milken Institute School of Public Health also serves as the home of the Commission to Build a Healthier America, STOP Obesity Alliance, and Geiger Gibson Program in Community Health Policy. Programs such as the Aligning Forces for Quality, a major national program funded by the Robert Wood Johnson Foundation is focused on raising the overall quality of health care, reduce racial and ethnic disparities, and providing models for national reform. Milken Institute SPH was also awarded the prestigious Medical Education Partnership Initiative (MEPI) award to be a coordinating center, in addition to a $4.6M award from the Health Resources and Services Administration (HRSA) to build curriculum and training programs for Health Information Technology workers. These partnerships and programs provide pathways for our faculty and student body to
work on high-level public health initiatives that have an impact on communities across the country and overseas.

Given our prime location in Washington, DC, we are often invited to work with and advise federal agencies, Congress, and the White House on public health issues. Some of our faculty also provide strategic and technical advice to clients to help them understand the evolving world of public health and health policy. The school’s Department of Health Policy and Management has been rated as one of the top ten academic health policy units in the nation, according to US News and World Report. The Department conducts innovative and rigorous research that is also pertinent to ongoing policy and management issues confronting the nation and the world. Research activities within the Department are dedicated to providing policymakers, public health officials, health care administrators and advocates, and the public with the information and ideas they need to improve access to high quality affordable health care and population health. The faculty in the Department have a diverse portfolio of research from numerous funding agencies, including the National Institutes of Health, Centers for Disease Control and Prevention, Agency for Healthcare Research and Quality, Patient-Centered Outcomes Research Institute, Centers for Medicare & Medicaid Services, Health Resources and Services Administration, Robert Wood Johnson Foundation, Commonwealth Fund, District of Columbia Department of Health, The Atlantic Philanthropies, W.K. Kellogg Foundation, The Kresge Foundation, American Heart Association, Trust for America’s Health, Henry J. Kaiser Family Foundation, and many others.

The Department of Epidemiology and Biostatistics engages in many research activities through the Center for HIV/AIDS Epidemiology, Biostatistics, and Public Health Laboratory Research, George Washington University Biostatistics Center, and Biostatistics and Epidemiology Consulting Service (BECS). The Department also houses Biostatistics Core services for the District of Columbia Center for AIDS Research (DC CFAR), and for GWU researchers at the Clinical and Translational Science Institute at Children's National (CTSI-CN). Department faculty members have an extensive portfolio of research projects in their areas of expertise: applied biostatistics, behavioral epidemiology, cancer epidemiology, chronic disease epidemiology, clinical trials, health disparities in minority communities, HIV/AIDS/hepatitis/sexually transmitted disease epidemiology, geographic information systems (GIS), infectious disease epidemiology, public health microbiology and virology, and reproductive health epidemiology. Funding agencies have included the Centers for Disease Control and Prevention, National Institutes of Health, Health Resources and Services Administration, District of Columbia Department of Health, Patient Centered Outcomes Research Institute, Cepheid, and Elizabeth Glaser Pediatric AIDS Foundation.

The Department of Prevention and Community Health promotes state-of-the-art scientific approaches to develop, implement, and evaluate innovative and theoretically-based interventions to promote health and well-being. Faculty in the department hold a diverse portfolio of research from numerous funding agencies, including the National Institutes of Health, Centers for Disease Control and Prevention, National Institute on Drug Abuse, Department of Defense, American Heart Association, Robert Wood Johnson Foundation, Bloomberg Family Foundation, Centers for Medicare and Medicaid Services, UNICEF, USAID, and state governments. Current initiatives at the department include the Center for Health and Health Care in Schools, the Center for Social Well-Being and Development, the Avance Center for the Advancement of Immigrant/Refugee Health, the Prevention at Home project, and the Sumner M. Redstone Global Center for Prevention and Wellness. The faculty in the department work in the United States and various countries in Asia, Africa, South America, and Europe.

The scope of the Department of Environmental and Occupational Health’s research and training focuses on sustainability, infectious diseases, risk analysis, occupational health social and community environmental health. The Department’s focus spans from the greater Washington DC metropolitan area to multiple continents, including projects in Asia, Africa, Europe and Latin America. Faculty in the Department hold a diverse portfolio of research from numerous funding agencies, which has included the Department of Defense, National Institute of Environmental Health Sciences, NIH-National Cancer Institute, Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health, CPWR, NIH-Fogarty International Center, NASA, National Institute of Allergy and Infectious Diseases, National Science Foundation, Canadian Institutes of Health Research, Robert Wood Johnson Foundation, US Army Medical Research and Material Command, USDA, and Pew Charitable Trusts.
Areas of research expertise within the Department of Global Health include maternal, newborn, and child health, malnutrition, infectious disease, chronic disease, environmental health, health diplomacy and governance of international health systems, demography, medical anthropology, health systems analysis, global health economics, program evaluation, humanitarian emergencies, and global public health communication. Faculty in the Department hold a diverse portfolio of research and technical assistance from numerous funding agencies, including the National Institutes of Health, the National Science Foundation, USAID, the United Nations Foundation, the Bill & Melinda Gates Foundation, as well as other foundations. The department is also home to the Journal of Health Communication, one of the most respected journals in that field.