**FACILITIES AND OTHER RESOURCES**

**RFMH**

**ENVIRONMENT**

Dr. Denny is part of two overlapping communities – the Department of Systems Neuroscience at RFMH/NYSPI and the Department of Psychiatry at CUIMC. Dr. Denny is also faculty in the Columbia Doctoral Program in Neurobiology and Behavior (NB&B). These communities sponsor formal and informal seminars and retreats, making this a vibrant and interactive intellectual atmosphere. Dr. Denny is a Faculty Research Fellow in the Columbia Aging Center and has frequent meetings with other Aging Research Fellows. Dr. Denny is also a member of the NYSPI IACUC.

**Columbia University Irving Medical Center (CUIMC):** Situated on a 20-acre campus in Northern Manhattan and accounting for roughly half of Columbia University's nearly $4.4 billion annual budget, CUIMC provides global leadership in scientific research, health and medical education, and patient care. CUIMC consistently has been praised for the quality, innovation, and academic rigor of its educational programs, as well as for the unsurpassed excellence of its faculty. Home to approximately 4,318 students and over 3,000 part-time and full-time faculty members, the health sciences campus includes the four professional schools—Vagelos College of Physicians and Surgeons, the College of Dental Medicine, the School of Nursing, and the Mailman School of Public Health—as well as the biomedical science PhD programs of the Graduate School of Arts and Sciences. Faculty members from all four schools carry out the core mission of educating and training future generations of health care professionals, conduct basic research with the ultimate goal of translating discoveries into new techniques for fighting disease and improving health, and are responsible for a number of significant clinical breakthroughs―among them, the first blood test for cancer, the first medical use of the laser, and the first successful transfer of genes from one cell to another. CUIMC's tradition of innovation has led to significant achievements, including the first successful heart transplant in a child; Nobel-winning developments in cardiac catheterization, isolation of the first known odor receptors in the nose, and discoveries about how memory is stored in the brain; the first use of Dilantin to treat epilepsy; development of the antibiotic bacitracin; creation of the Apgar score to assess newborns; identification of cystic fibrosis; and design of the first significant programs to reduce maternal mortality in resource-poor countries. CUIMC’s major teaching hospital affiliates are NewYork-Presbyterian Hospital and the New York State Psychiatric Institute, both of which share the CUIMC campus. NewYork-Presbyterian Hospital consistently ranks #1 in NYC and top 10 in the nation by US News and World Report. The medical center also has academic affiliations with Bassett Healthcare, in Cooperstown, NY; the Isabella Geriatric Center, in New York City; and Arnot Ogden Medical Center, in Elmira, NY; and Stamford Hospital in Stamford, CT. Columbia’s faculty practice is ColumbiaDoctors.

**New York State Psychiatric Institute (NYSPI):** NYSPI, established in 1895, was one of the first institutions in the United States to integrate teaching, research and therapeutic approaches to the care of patients with mental illnesses. In 1925, NYSPI affiliated with NewYork-Presbyterian Hospital, adding general hospital facilities to the Institute's psychiatric services and research laboratories. These treatment, training, and research facilities were supplemented in 1983 by a 14-floor Psychiatric Research Building, the Kolb Annex. NYSPI was further modernized in 1998 by opening of a new hospital building to replace the original one. Overlooking the Hudson River and George Washington Bridge, the new Psychiatric Institute provides a state-of-the art environment for patient care, education, and research. The approximately 320,000 square feet offer space for 60 inpatient beds, 23 specialized outpatient research clinics, educational facilities, and research laboratories. Walkway bridges to and from the Kolb Annex and NewYork-Presbyterian Hospital provide comfortable and efficient all-weather avenues for patient and staff travel within the CUIMC.

**Research Foundation for Mental Hygiene, Inc. (RFMH)**: RFMH is a not-for-profit membership corporation organized in 1952, for the purpose of assisting and enhancing the research and training objectives of the New York State Department of Mental Hygiene and its component agencies; the Office of Mental Health, the Office of Mental Retardation and Developmental Disabilities and the Office of Alcoholism & Substance Abuse Services. It is governed by a Board of Directors, consisting of twenty-six prominent scientists, administrators and government officials, which is responsible for setting the operational policies of the corporation.

**FACILITIES**

**Laboratory:** Dr. Denny’s 1st room is her main laboratory room on the 7th floor of the Kolb Annex and is approximately 350 sq. ft. This room includes 3 wet lab benches (for 3 researchers plus their equipment) with desk space at the end of each bay. There are 2 additional desks for undergraduates or students to use. The laboratory is outfitted with a fume hood, 2 Biorad Thermal Cyclers, a 4°C fridge, a -20°C fridge, a -80°C freezer, electrophoresis power supplies, and standard equipment for DNA and protein analysis. The main lab also has a separate office area with desk space for 2 post-doctoral fellows (~40 sq ft). This room also houses a HP Officejet printer/fax/scanner/copier for the laboratory and a server.

Dr. Denny’s 2nd room is a microscopy room on the 7th floor of the Kolb Annex and is approximately 182 sq ft. This room houses a Leica SP8 MP microscope (multiphoton and confocal), Leica SPE confocal microscope, and an image processing station. There are 3 processing computers in total.

Dr. Denny’s 3rd room is a perfusion room and is approximately 74 sq ft. It has additional bench space, a sink, a fume hood for perfusions, and houses the cooling unit for the Leica confocal room.

Dr. Denny’s 4th room is a microscopy processing room on the 7th floor of the Kolb Annex and is approximately 117 sq. ft. This room houses a wet lab bench with desk space at the end of the bay for a post-doc. This room also houses 2 cryostats, CLARITY clearing equipment, iDISCO clearing equipment, a water bath, and a 4°C refrigerator.

Dr. Denny’s 5th room is an office suite. It houses 4 desks for 4 members of her laboratory. One of the servers resides in this room. This room also houses a printer/scanner/copier for the laboratory.

Dr. Denny’s 6th room is an office suite. It houses 2 desks for 2 members of her laboratory to work.

Dr. Denny’s 7th room is Dr. Hunsberger’s office. It houses 1 desk with a printer for Dr. Hunsberger.

**Animals:** Mice are housed on the 10th floor of the Kolb Annex at NYSPI, an AAALAC-approved Animal Care Facility. Faculty and staff receive extensive training in animal welfare and ethical experimental procedures, and must pass an annual certification test. The PI has been provided with dedicated mouse space for a minimum of 300 cages (5 mice / cage) at any one timepoint. Dr. Denny’s mice are currently housed in 2 separate rooms that allow for breeding and experimental space.

Dr. Denny has a surgery suite inside the animal facility. All surgery equipment is listed in **Major Equipment**.

Dr. Denny has a behavioral suite that is assigned to just her laboratory. All equipment is listed in **Major Equipment**.

**Clinical:** Not applicable.

**Computer and database facilities:** Dr. Denny has a personal iMac at her desk. This computer is part of a 10/100/1000Mbps TCP/IP based Cisco network that resides behind a Netscreen firewall. All individual computers are able to access centralized services such as NAS (Network Attached Storage) servers, email servers, and backup servers. These systems are maintained and upgraded by the Neuroscience Information Technology team in collaboration with the institutional networking group. All computers are loaded with a variety of productivity software including graphics, data and text processing suites. The Database Management Unit at NYSPI is also available.

Dr. Denny’s laboratory has 8 iMacs, 4 PCs, and 2 Mac Pros. There are 2 additional MacBook laptops and 1 Dell PC laptop for additional students to work on.

Dr. Denny has 2 servers to house imaging data: 1 Seagate 20 TB server and 1 Synology RS816 24 TB server. Both servers are connected to the network and accessible by all of the computers in the laboratory.

For the computers associated with the Leica microscopes (3), there are 3 PC processing computers, 1 for each microscope.

**DSBIT computer cluster**: The lab has purchased access to the Department of Systems Biology Information Technology (DSBIT) computer cluster for efficiently running the brain-wide image analysis. The DSBIT maintains several high-performance computing systems, including multiple high-performance compute clusters as well as high-memory systems. In 2013, they installed a new cluster with 6,336 CPU-cores and 73,728 CUDA-cores (GPU). It has a maximum performance of 212 TFlops, almost 9 times the performance of its predecessor. The system is on the Top500 list of supercomputers worldwide.

This computing system includes 10 Gb/s Ethernet fabric throughout, 40 Gb/s QDR InfiniBand for a portion of the system, GPU-enhanced computing, and a low power hardware architecture. All of the clusters run current variants of the Linux operating systems, and are managed by Univa Grid Engine. Additionally, DSBIT has two high-memory systems with 1 TB of system memory each, and a pool of computational servers for compilation, debugging, and job control.

**Office:** Dr. Denny’s office is located on the 7th floor of the Kolb Annex. She has a VoiP telephone and a color laser printer/scanner/copier.

**Shared Facilities:** There is also access to a physiology room (250 sq ft), a dark room (130 sq ft), a histology and solution preparation room (100 sq ft), and a microscope room containing fluoresence and phase constrast microscopes. Dr. Denny and Dr. Hen share a 4°C cold room.

The laboratory resides near a conference room with digital projection capabilities that is utilized regularly for lab and multigroup meetings. A shared dishwashing facility and cold room is present on the same floor as the laboratory.

**Other Resources:**

Navieta Ramasami, the administrator of the Division of Systems Neuroscience Division, has an adjacent office.

Photo and Illustration Department of NYSPI: staff of 3, computer-based illustration with dye sublimation printers, large-format color inkjet printer (for posters), and routine photographic services.

NYSPI Library and Columbia University Health Sciences Library: free on- and off-campus access to electronic resources, i.e., journal articles, databases, and eBooks.

**Boston University**

**FACILITIES & OTHER RESOURCES Position’s details:
ENVIRONMENT**

**Appointment:** Dr. Ramirez is appointed as an Assistant Professor at Boston University in the Department of Psychological and Brain Sciences. He is a part of three overlapping communities: the Department of Biology, the Center for Systems Neuroscience, and the Center for Integrated Life Sciences and Engineering (CILSE). His position acknowledges full independence, permits submission of foundation and federal grants, and receives ample support in terms of facilities, resources, and career development, outlined below. His position also entails attending frequent seminars in each Department and Center, shared lab with members of the Center for Systems Neuroscience, and retreats for each Department.

**Institutional environment:** Dr. Ramirez is appointed as an Assistant Professor at Boston University and he will serve as the co-investigator of the proposed projects during the R01 award period. He is directly integrated into the CILSE community and the Center for Systems Neuroscience, in addition to both the departments of Biology and Psychology and Brain Sciences. This administrative structure will best meet the goal of supporting the success of Dr. Ramirez’s R01 period because, as a member of our community, he partakes in a variety of collaborative activities including attending and presenting at formal seminars, institutional retreats, department faculty committees, as well as career development resources including workshops in grant writing and management.

**Administrative and other support:** Administrative support includes access to CILSE administrators for ordering equipment and fiscal management of grants, as well as senior research development officers for building subsequent award proposals. Dr. Ramirez will be part of two partially overlapping communities – the Center for Systems Neuroscience and the Center for Memory and Brain, both consisting of faculty from the departments of Biology and Psychology & Brain Sciences. He will tremendously benefit from interactions with faculty of both groups, including Profs. Eichenbaum, Hasselmo, Somers, and Chen. The aforementioned communities all sponsor formal and informal seminars and retreats, making this a vibrant and interactive intellectual atmosphere

**FACILITIES**

**Laboratory:** The Ramirez lab is located in the CILSE building—a state of the art, 170,000 sq ft building that opened in 2017. The lab includes four behavior rooms, each 100 sqft, a dissection and histology room (with vibratome, cryostat and stereomicroscopes), a surgery suite (with 2 laminar flow hoods and 2 double-chambered incubators), a dedicated surgery suite equipped for stereotaxic surgery for up to 5 animals simultaneously, necropsy and vivarium suites with two fume hoods, as well as individual 100sqft rooms for confocal imaging and calcium imaging. The lab also includes three wet lab benches, a general office area and a large desk area for data analysis, as well as laboratory workspace for electrode fabrication, drug and slice preparation.

The surrounding laboratories in CILSE have climate-controlled rooms, freezers, and shared facilities for cutting-edge light and confocal microscopy. Engineering staff of at CILSE will assist with the design and fabrication of computer-controlled behavioral apparatuses and software for data acquisition and analysis. Their offices and fully equipped machine and electronics shops are in CILSE as well.

Dr. Ramirez has a surgery suite inside the animal facility. All surgery equipment is listed in **Major Equipment**.

Dr. Ramirez has a behavioral suite that is assigned to just her laboratory. All equipment is listed in **Major Equipment**.

**Clinical:** Not applicable.

**Animals:** CILSE’s vivarium is supervised by a full-time veterinarian staff which is available 24hr/day 7 days/week, as required by the Public Health Service, the USDA and AAALAC. The vivarium is located on the 6-8th floor adjacent to all surgical and behavioral testing facilities. Additional secondary vivarium space is available to accommodate procedures requiring special lighting and temperature conditions. The facility provides species dedicated / specific housing arrangements and is adjacent to our laboratory space. The Boston University/CILSE animal care and use program maintains full AAALAC accreditation, is assured with OLAW, and is currently registered with the USDA. For behavioral experiments, mice will be housed in the eighth floor of the vivarium space in CILSE. Dr. Ramirez’s vivarium space can house up to 200 cages of rodents simultaneously. Mice can be removed for behavioral experiments and returned to their cages on the same floor as his lab, thus permitting convenient and efficient transfer of animals for experiments. Boston University maintains an Institutional Animal Care and Use Committee (IACUC) as required by the Public Health Service (PHS) Policy on Humane Care and Use of Laboratory Animals. Animals are maintained in accordance with the "Guide for the Care and Use of Laboratory Animals" (National Research Council, 8th edition, 2011), and all animal protocols must be approved by the IACUC before animals can be ordered. Research personnel receive training in animal welfare and ethical experimental procedures and must pass a mandatory triennial refresher training course on the same subject matter

**Office:** Dr. Ramirez has a dedicated office adjacent to his lab. Institutional Support at CILSE includes separate offices for all permanent faculty, administrative assistants, postdoctoral fellows, graduate students, and all the institutional support of the grants and contracts office, animal resources, veterinary support, animal care support, etc. All research associates (post-docs), assistants and technicians each have individual desk space.