**Laboratory:** The equipment listed below are under the direction of Dr. Frank Middleton, Director of the SUNY Molecular Analysis Core (SUNYMAC) at Upstate Medical University. Dr. Middleton holds appointments in the Department of Neuroscience & Physiology, the Department of Psychiatry and the Department of Biochemistry & Molecular Biology at SUNY Upstate. He established the SUNYMAC facility in 2002 and has served as director ever since. The core has performed more than 10,000 microarray and 1,000 next generation sequencing (NGS) experiments to date and functions as a full-service provider of these technologies, in addition to any required validation work involving real-time quantitative or digital qPCR, or multiplex protein assays. Major equipment is listed below, by application:

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| **Application** | **Equipment** |
| Automated dispensing into 96 or 384 well plates | Biotek Microflo Plate Dispenser  |
|  | Thermo Scientific Matrix Hydra  |
| Automated RNA, DNA, and protein extraction | Qiagen Qiacube  |
| Chromatin shearing for immunoprecipitation (ChIP) | Covaris M220 Focused-ultrasonicator |
| Cross-linking of RNA or DNA to membranes | BioRad GS UV Gene Linker, Gel Dryer, vacuum pump  |
| Gel preparation and analysis | UVP High Performance UltraViolet Transilluminator Spectroline UV transilluminator Bio-Rad Chemi Doc  |
| General lab procedures | Refrigerated and non-refrigerated centrifuges, high speed centrifuges, hotplates, minifuges, vortexes, pH meters, scales, water baths, ovens, fume hoods (including perchloric acid), ultra sonicator, tissue homogenizer, vacufuge, refrigerators, freezers (-20 and -80C), Milli-Q UFMilli-RO water systems |
| ELISA; luciferase assays; DNA/RNA quantification | Biotek plate reader  |
| High throughput PCR | Bio-Rad Tetrad thermal cycler |
| Laser microdissection and tissue processing | Leica CryostatLeica AS-LMD Microscope  |
| Luminex-based multiplex RNA or protein assays | Bio-Rad BioPlex 200 System w/Pro II wash station  |
| Microarray processing | Affymetrix Hybiridization ovens (2), Microfluidics system (3), 7G/4C Scanner  |
| Next-generation sequencing  | Illumina MiSeq (50M paired-end reads, up to 15 Gbase/run)Illumina NextSeq500 (800M paired-end reads, >120 Gbase/run) |
| Nucleic acid/protein separation and quantification | Qubit 3.0 FluorometerThermo Scientific NanoDropEppendorf BioPhotometer Life Technologies Horizontal Gel Electrophoresis System Mini-, medium and large horizontal gel boxes |
| RNA, DNA, and protein QA/QC | Agilent Bioanalyzer  |
| Routine and real time quantitative PCR | Eppendorf MasterCycler Gradient Thermo Scientific Arktic ThermocyclerBio-Rad QX200 Droplet Digital PCR SystemBio-Rad CFX384 Touch Real-Time PCR Detection System |
| NGS sequencing analysis software | Strand NGS - alignment, whole-genome/exome/methylome Partek Flow - RNA-Seq and ChIP-SeqPartek Genomics Suite - advanced statistical data miningIPA (Ingenuity) - advanced bioinformatic/pathway analysisSequencher (Gene Codes) - metagenomics, methylation |

The SUNYMAC facility occupies a 1700 sq ft suite of labs in the newly-constructed Neuroscience Research Building at SUNY Upstate. This state of the art facility contains several smaller dedicated labs for: (1) tissue processing, cryosectioning and laser microdissection, (2) semi-automated DNA, RNA and protein extraction and QC analysis, (3) real-time qPCR and digital droplet qPCR, (4) next generation sequencing and microarray sample preparation, (5) sequencing and scanning of NGS samples, microarray samples, Luminex xMAP samples, plate reader utilization, Bioanalyzer assays, and various other procedures. The Core also operates 12 high-end PC systems for the various molecular analysis hardware platforms, and four additional high-end computers for data analysis, loaded with various state-of-the-art software, such Partek Genomics Suite, Strand NGS, and IPA, among others, for conducting statistical and genetic analyses.