

# HD EEG and Psychophysiology (HEP) Laboratory Template for the “Facilities and Resources” module of NIH Grant applications SF 424 and PHS 398

The following document can be copied and pasted directly into an NIH Grant application (form SF 424 [<http://grants.nih.gov/grants/funding/424/>] or the older PHS 398 [<http://grants.nih.gov/grants/funding/phs398/phs398.html>]), in the “Facilities and Resources” module.

The statements below are intended to only apply to psychophysiology data acquisition and analysis resources in the HEP Laboratory; other resources that might be part of the research proposal should be added directly by the Principal Investigator.

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## RESOURCES

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**FACILITIES:** Specify the facilities to be used for the conduct of the proposed research. Indicate the performance sites and describe capacities, pertinent capabilities, relative proximity, and extent of availability to the project. Under "Other," identify support services such as machine shop, electronics shop, and specify the extent to which they will be available to the project. Use continuation pages if necessary.

### Laboratory:

The Human Development EEG & Psychophysiology (HEP) Laboratory in the Dept. of Human Development at Cornell University, features state-of-the-art electroencephalographic (EEG), electrodermal activity (EDA) and eye-tracking data acquisition systems, all protected within a comfortable 42 sq. ft. inner room that also serves as a complete Faraday cage for electromagnetic noise attenuation (50 dB shielding effectiveness at 1 kHz). The facility employs a Biosemi ActiveTwo EEG system that features active electrodes, a 16 kHz/channel maximum sample-rate, a dense array of 128+8 channels, and cap sizes to fit all participants over the age of 3. This ActiveTwo system is capable of bi-polar electromyographic (EMG) recordings as well. The laboratory also features an SR-Research EyeLink CL gaze-tracking system, with a sampling-rate of up to 1000 Hz, and head-mount accessories. The HEP Laboratory also offers 8 portable Affectiva Q sensors, which wirelessly measure electrodermal activity (EDA) as skin conductance. The HEP Lab's 500 sq. ft. room is housed in the new, high-tech Human Ecology Building, which is adjoined to the buildings and spaces of several related departments, thus offering an attendant ease of use. The technical support for experiment set-up, data acquisition, and basic data analysis are built into the cost of using the facility; however, additional data analysis assistance is also available, above and beyond the standard deliverables. The facility is available at any time of the day or week, with advance scheduling, and can accommodate experiments of any duration. The core technician's careful attention to the leading edge of EEG data analysis methodology assures that ERP selection, artifact removal, component determination, source reconstruction, and related analysis steps adhere to the evolving standards of the field.

### Clinical:

Not applicable.

### Animal:

Not applicable.

### Computer:

The Human Development EEG & Psychophysiology (HEP) Laboratory features an integrated data acquisition and data analysis pipeline, featuring a full

complement of essential software packages (MATLAB, EEGLAB, SPM8, E-prime, SPSS, ActiView, Acqknowledge, Microsoft Office Suite), several powerful computer workstations dedicated to data reduction and analysis, and access to college-wide data storage networks. Additional computers in the lab enable researchers to design experiments in E-prime or other stimulus-presentation and behavior recording software (e.g. Inquisit) and present them to subjects within the EMI-shielded booth. The segregation of computationally intensive tasks among several workstations optimizes efficiency by enabling multiple data acquisition or analysis streams to proceed in parallel. Several instances of proximal and distal data back-up ensure defense against loss of data. The Laboratory and the Department are also fully supported by dedicated IT specialists.

Office:

The Laboratory features a shared office area (approximately 280 sq. ft.), within reach of the computational work area, where collaborators can discuss and then execute or modify analysis steps. Collecting informed consent from participants occurs on-line or in several nearby common meeting rooms that can be easily reserved.

Other:

Not applicable.

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The Human Development EEG & Psychophysiology Laboratory of Cornell University serves the faculty and students of the department in an essential capacity. Prohibitively costly equipment and steep learning curves might thwart many otherwise able researchers from pursuing electroencephalography and psychophysiology methods. In an affordable and efficient manner, this core laboratory can remove those obstacles and maximize research productivity while standardizing the quality of data output and minimizing the costs to the researcher.