

Equipments and methods: At present the laboratory has procured the following equipments for research purposes

- 1. 40 channel Nihon-Khoden polysomnography system:** This system serves as a digital electroencephalogram (EEG) and polygraph. With up to 44 channels (20 EEG/PSG inputs, 14 bipolar inputs, 10 DC inputs, and integrated SpO2 adapter connection) it is the ideal alternative for polysomnographic diagnostic recording. The scope of functions can be easily extended with optional add-ons, such as the latest generation of synchronous video recording. With integrated frequency and amplitude mapping, even the comprehensive standard software of our Neurofax series provides a range of functions which greatly exceeds the normal standard. The optional Polysmith™ software enables powerful, automated sleep analysis with report functionality.
- 2. Transcranial direct current stimulation (tDCS):** It is a method of noninvasive brain stimulation that modulates neuronal resting membrane potentials, leading to changes of cortical excitability, and activity, which can outlast the stimulation for hours. Beyond its physiological effects, tDCS has been shown to have an impact on cognition and behavior. For patients suffering from neuropsychiatric diseases, the potential benefits of neuromodulation induced by tDCS has been increasingly investigated in depression, substance abuse and craving including alcohol, tobacco, marijuana and also foods disorders. Besides transcranial direct current stimulation (tDCS) the DC-STIMULATOR PLUS also makes it possible to conduct bi-polar stimulation (tACS).

❖ 1 channel, unipolar (DC) and bipolar (AC) stimulation

- ❖ Adjustable range of current $\pm 4,500 \mu\text{A}$, maximum adjustable current strength $\pm 1,500 \mu\text{A}$ (peak-to-peak)
- ❖ Adjustable application time up to 30 minutes
- ❖ Frequencies adjustable up to 250 Hz, phase freely adjustable
- ❖ 4 standard modes - tDCS (continuous stimulation) - pulse (cyclical stimulation activation/deactivation) - sinus (sinus wave) - noise (normally distributed)
- ❖ customer-specific programs possible (optional)

3. ActivaDose II Iontophoresis Delivery Unit: ActivaDose II Single Channel

Iontophoresis Delivery Unit is indicated for the administration of soluble salts or other drugs into the body for medical purposes as an alternative to hypodermic injection in situations when it is advisable to avoid the pain that may accompany needle insertion and drug injection, when it is advisable to minimize the infiltration of carrier fluids, or to avoid the damage caused by needle insertion when tissue is traumatized.

4. E-prime 2.0 for designing experiment: This set of applications is used for computerized experiment design, data collection and analysis. It provides millisecond precision timing to ensure the accuracy the data. E-Prime's flexibility to create simple to complex experiments is ideal for both novice and advanced users. The basic feature of the software comprises of:

- ❖ Enhanced graphical interface
- ❖ Ability to play digital movies as stimuli (MPEG, AVI, WMV)
- ❖ Copy & paste objects between experiments

- ❖ Digital recording of participant vocalizations
- ❖ Increased display speed for bitmap transfers
- ❖ Support for additional image formats
- ❖ Support for presentation of stimuli on multiple video displays
- ❖ Display stimuli on any attached monitor
- ❖ Improved audio support
- ❖ Support for UNICODE and international fonts
- ❖ Support for new devices (Joystick, Parallel Port Device, Network Socket Device)
- ❖ Expanded support for larger scripts
- ❖ Improved documentation and indexing of online Help
- ❖ A comprehensive scripting language
- ❖ Professional version available with additional capabilities

5. ***Brain vision ActiCHamp***: It integrates high-end components for electrophysiological research into one system. The actiCHamp (active channel amplifier) is a 24-bit battery-supplied amplifier. Eight additional AUX inputs are incorporated in the basic module of the amplifier. The AUX channels can be used with a broad range of bio-signal sensors. It has a sampling rate of up to 100 KHz and wide hardware bandwidth. The actiCHamp system is equipped with the Brain Products' active electrodes or actiCAP. Signal recordings can be performed using BrainVision PyCorder or BrainVision Recorder.

6. ***Philips Respironics Actiwatch 2(Software version 6.0.2)***: This equipment is used for acquiring accurate and objective data about activity, sleep, wake, and light-exposure. Due to its small size younger wearers or those sensitive about wearing a wrist-worn device

can wear it quite comfortably. It also has a light sensor and event marker to record significant events (like lights out time).