The aim of this session is to provide an introduction to the electroencephalogram and to explore the electrical activity of the brain. In this laboratory class you will record electroencephalograms from a volunteer, look at interfering signals, and examine the effects of visual activity on alpha waves.

The EEG or electroencephalogram has long been used to record and study the electrical activity of the outermost layer of the brain – the cerebral cortex, which contains large numbers of neurons. In medicine, EEG is usually used exclusively to diagnose epilepsy (seizure disorders) and brain death.

EEG signal is a good indicator of patterns of cortical activation that play a role in many forms of psychological disorder, including ADHD, anxiety, depression, learning disabilities, and autism and other neurodevelopmental disorders.

Since human neural activity cannot be studied using intracellular recording techniques, electroencephalography (EEG) and magnetoencephalography (MEG) are two non-invasive techniques for detecting and localizing electrical activities of the central nervous system.

EEG systems measure the electric potentials induced on the surface of the scalp using electrodes. When two electrodes are attached to the surface of the human scalp and connected to an amplifier, the output of the
amplifier reveals variation in voltage over time.

MEG systems measure the magnetic fields emanating from the brain with a Superconducting QUantum Interference Device (SQUID) biomagnetometers.

EEG and MEG can be used in clinical applications such as localization of epilepsy sources, psychiatry, to determine brain death, or in neuroscience to analyze sensorymotor or cognitive functions of the brain.

Both EEG and MEG are non-invasive, have good temporal resolution, and directly yield information about neurological functions. Compared with EEG, MEG is more robust, more comfortable, has a (shorter preparation time, but is more expensive.

Electrodes location PEG

http://www.aurorahealthcare.org/healthgate/images/si55551220.jpg

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