

- however, the temporal resolution is much faster than PET
- fMRI is a widely available method, non-invasive technique that does not involve high radiation and multiple scans can be done on an individual unlike PET and it is quicker than PET
- the precision of scans obtained by fMRI allows us to examine brain-behaviour relationships in individuals useful for clinical interventions such as neurosurgery
- disadvantage only provides information about the *relative* concentration of oxygenated and deoxygenated blood

Electromagnetic Recording Methods

- used to record the electrical activity of the brain that results from neuronal firing or the magnetic fields induced by that electrical activity
- offer scientists the best available *temporal resolution* of brain activity
- Single-Cell Recordings
- Once a baseline firing for a given cell has been established, researchers then determine what properties of a stimulus make the cell fire maximally above that baseline.
- Researchers use this technique to examine various issues: to determine whether the cells are sensitive to input in only one sensory modality or are multimodal in sensitivity, whether they respond to information from only one specific place in the sensory world or from broad regions of space, whether a cell's response is modified depending on whether or not the individual's attention is directed toward the stimulus.
- Opportunities for studies with humans is limited but in animals there is a lot of research and studies that have conducted testing the single cell recordings
- However, there are cases where electrodes have been implanted into the brain for the removal of epileptic tissue and cases in which electrodes are placed on the surface of the brain during an operation to better isolate the source of seizure activity
- Such procedures allow scientists to acquire knowledge of the stimulus properties that make cells fire in a given brain region
- Electroencephalography (EEG)
- Recordings of the brain's electrical activity are often used clinically to detect aberrant activity such as that associated with epilepsy and sleep disorders
- In EEG electrical signals produced by brain are recorded by metal electrodes positioned on the scalp
- The number of electrodes used varies from 20 to more than 100 in high-density-array recording systems
- One electrode is connected to an electrically inactive site such as the *mastoid bone* (behind the ear) which acts as a reference that provides a base-line against which the activity at each of the other electrodes can be compared
- The electrical potential recorded at an electrode on the scalp is the summed or superimposed signal of the postsynaptic electrical fields of similarly aligned neuronal dendrites
- The electrical potential which is recorded as a waveform, has a voltage and a frequency it oscillates at a specific rate (measured in hertz)
- Frequency of EEG varies depending on the person's state. If person is relaxed with