In neuroscience, single-unit recordings provide a method of measuring the electro-physiological responses of single neurons using a microelectrode system. When a neuron generates an action potential, the signal propagates down the neuron as a current which flows in and out of the cell through excitable membrane regions in the soma and axon. A microelectrode is inserted into the brain, where it can record the rate of change in voltage with respect to time. These microelectrodes must be fine-tipped, high-impedance conductors; they are primarily glass micro-pipettes or metal microelectrodes made of platinum or tungsten.

Microelectrodes can be carefully placed within (or close to) the cell membrane, allowing the ability to record intracellularly or extracellularly.