Spike

Neurons produce action potentials that are referred to as 'spikes' in laboratory jargon. Frequently this term is used for electrical signals recorded in the vicinity of individual neurons with a microelectrode (exception: 'spikes' in EEG recordings)

see Interictal spike.

An action potential is a short-lasting event in which the electrical membrane potential of a cell rapidly rises and falls, following a consistent trajectory. Action potentials occur in several types of animal cells, called excitable cells, which include neurons, muscle cells, and endocrine cells, as well as in some plant cells. In neurons, they play a central role in cell-to-cell communication. In other types of cells, their main function is to activate intracellular processes. In muscle cells, for example, an action potential is the first step in the chain of events leading to contraction. In beta cells of the pancreas, they provoke release of insulin.[a] Action potentials in neurons are also known as “nerve impulses” or “spikes”, and the temporal sequence of action potentials generated by a neuron is called its “spike train”. A neuron that emits an action potential is often said to “fire”.

The analysis of action potentials, or “spikes,” is central to systems neuroscience research. Spikes are typically identified from raw waveforms manually for off-line analysis or automatically by human-configured algorithms for on-line applications. The variability of manual spike “sorting” is studied and its implications for neural prostheses discussed. Waveforms were recorded using a micro-electrode array and were used to construct a statistically similar synthetic dataset. Results showed wide variability in the number of neurons and spikes detected in real data. Additionally, average error rates of 23% false positive and 30% false negative were found for synthetic data [1)].

1)
Wood F, Black MJ, Vargas-Irwin C, Fellows M, Donoghue JP. On the variability of manual spike sorting. IEEE Trans Biomed Eng. 2004 Jun;51(6):912-8. PubMed PMID: 15188858.