

A new set of frequencies – define an HFO: what will we be talking about

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The EEG had traditionally been thought to include frequencies up to approximately 50Hz, possibly to 100Hz. Microelectrode studies in experimental animals and in humans demonstrated the presence of brief oscillations in the range of 80 to 500 Hz, with the higher frequencies (200 to 500 Hz) more likely representing pathological activity related to epilepsy. The generators of these oscillations were thought to be too small for them to be recordable with clinical macroelectrodes. High Frequency Oscillations were nevertheless recorded in humans with large clinical electrodes and this has led to many human studies defining the importance of these patterns in the context of epilepsy. HFOS have also been recorded in scalp EEG and MEG, further widening their reach. We will discuss the following points:

- How do we deal with fast transients, known to generate apparent oscillations when the EEG is filtered?
- How do we deal with EMG artefact, in scalp and intracerebral EEGs?
- Is it better/possible to have a strict and formal definition of HFOs or should we live with the usual fuzziness common to many EEG patterns?

Discussing the above points will help in framing our understanding of the mechanism of generation and the clinical utility of HFOs.