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Surprising aspects of synaptic integration in motor neurons

Establishing how individual neurons respond to synaptic input is essential for understanding how the nervous system processes information. In general, neurons are thought to perform a kind of arithmetic, tallying up excitatory and inhibitory synaptic events, the sum of which is manifest in the firing rate of a neuron. Surprisingly little, however, is known about how this fundamental process actually operates, largely because of the difficulty associated with controlling the intensity of synaptic input to a neuron. In this talk, I will argue that human motor neurons provide an excellent model with which to study processing of synaptic information *in vivo*. Indeed, our recent experiments reveal a surprising limitation in the ability of motor neurons to respond to synaptic input; a result that may have far-reaching impact on our understanding of information processing by neurons.