Advanced readings lecture 2

Unique features of action potential initiation in cortical neurons.
Nature. 2006 Apr 20;440(7087):1060-3.
Naundorf B, Wolf F, Volgushev M.

https://www.ncbi.nlm.nih.gov/pubmed/16625198

This paper describes that spiking in cortical neurons has a behavior that is not described by the H-H model, and is indicative of cooperative activity in Na channels.

Information processing in the axon
Dominique Debanne
Nature Reviews Neuroscience **volume 5**, pages 304–316 (2004)

doi:10.1038/nrn1397

This review discusses how geometrical properties of the axon can create properties such as action potential failure and reflection that can influence signaling.

Modulation of intracortical synaptic potentials by presynaptic somatic membrane potential
Shu et al., McCormick (2006)

https://www.ncbi.nlm.nih.gov/pubmed/16625207

This paper shows that the presynaptic terminal in many cortical neurons is close enough to the action potential initiation site that the somatic membrane potential influences transmission independent of spiking: i.e. digital and analog transmission.

Somatic EPSP amplitude is independent of synapse location in hippocampal pyramidal neurons.
Nat Neurosci. 2000 Sep;3(9):895-903.
Magee JC1, Cook EP.

https://www.ncbi.nlm.nih.gov/pubmed/10966620

This paper shows that in the apical dendrite for hippocampal pyramidal neurons, there is significant attenuation of synaptic input with distance, but that distal synapses have a larger intrinsic amplitude compensating for this attenuation. By the time the synaptic current reaches the soma, both distant and nearby synapses end up having similar effects.