Abstract for brief talk by Roger D. Traub, M.D.

(Taken from this recent publication: Traub, R.D. and Whittington, M.A. (2022) A hypothesis concerning distinct schemes of olfactory activation evoked by perceived vs. non-perceived input. *Proc. Natl. Acad. Sci. USA* 119(10): e2120093119.)

Odors of similar intensity may be perceived or not by human subjects. Perceived ones correlate with brain magnetic fields, delayed some hundreds of ms, that are not present for unperceived ones. How might this occur? The endopiriform nucleus is an excitable structure, considered part of the claustrum, that is interconnected with primary olfactory (piriform) cortex. A procedure called kindling allows the endopiriform nucleus to generate epileptiform activities in vitro that are delayed ~100 ms after a stimulus – suggesting a mechanism for delayed activity. Using a detailed computational model of piriform cortex, consistent with in vitro experiment, we show that addition of neurons with endopiriform properties could allow similar stimuli to generate either brief responses or prolonged ones, depending on parameters such as a persistent Na^+ conductance. Brief responses putatively correlate with lack of conscious perception, and prolonged responses with the presence thereof.