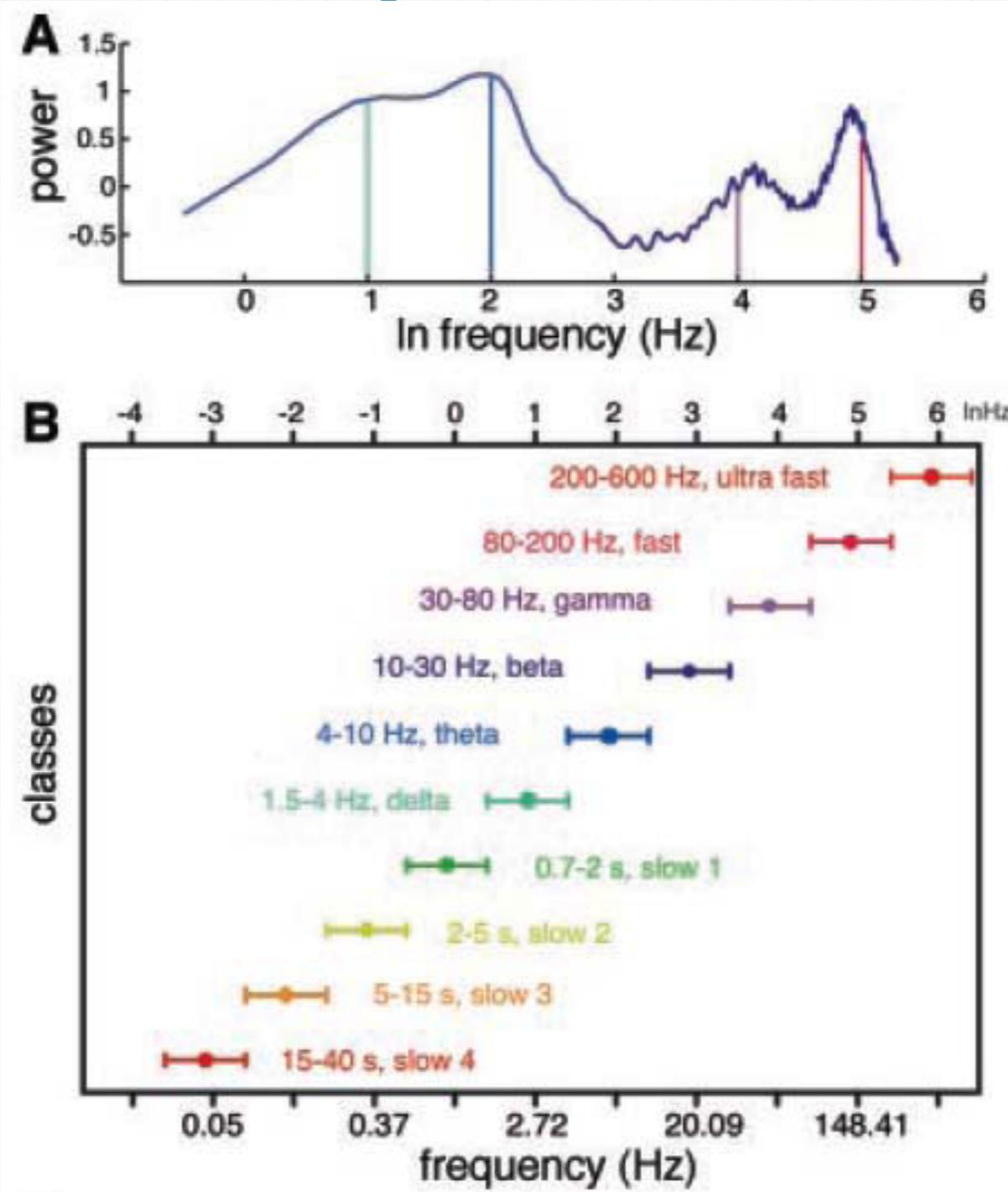


BioE332 Lecture 1

Kwabena Boahen

EEG Spectrum

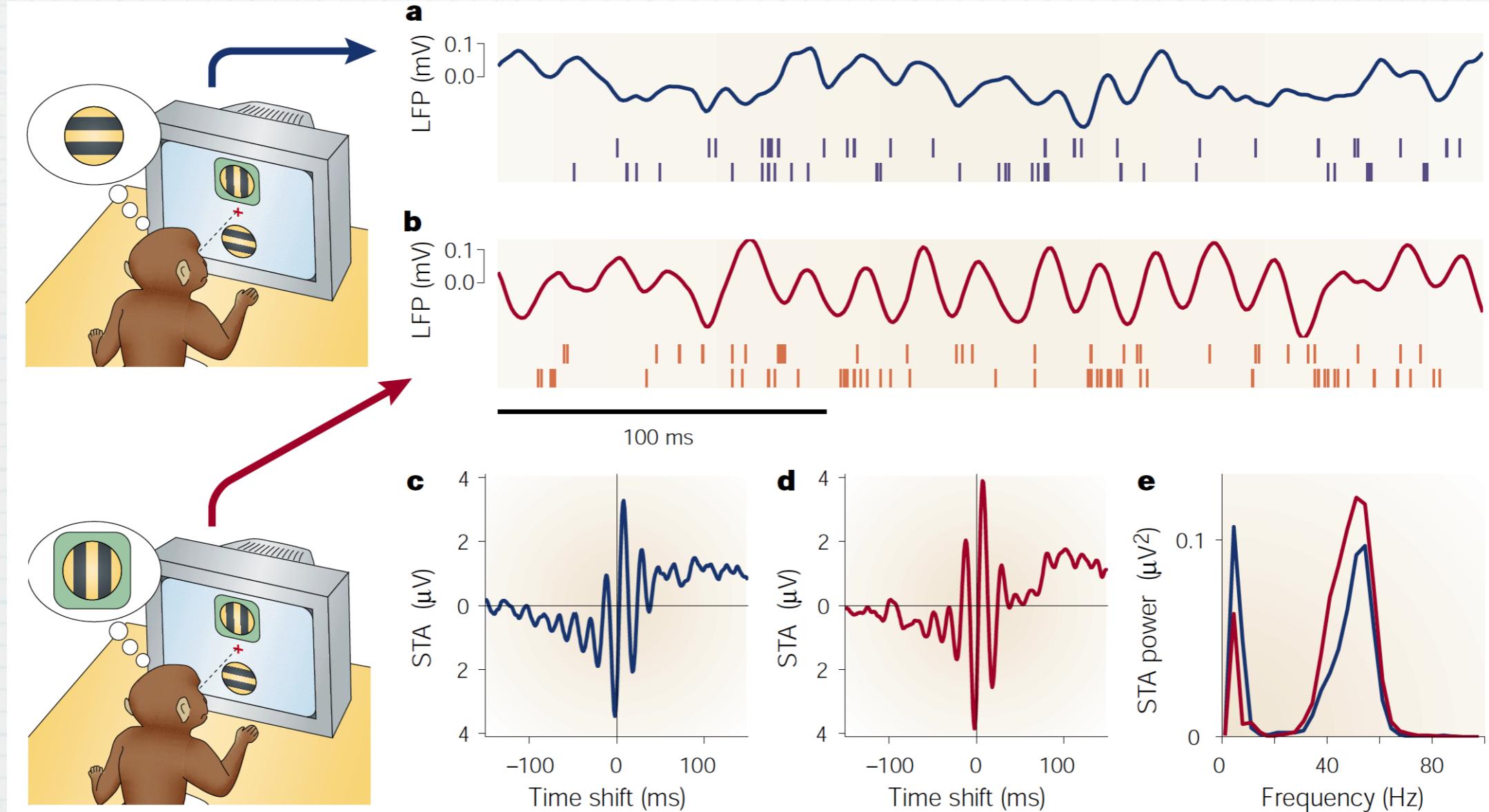


[Buzsaki 04]

Functions of Neuronal oscillations

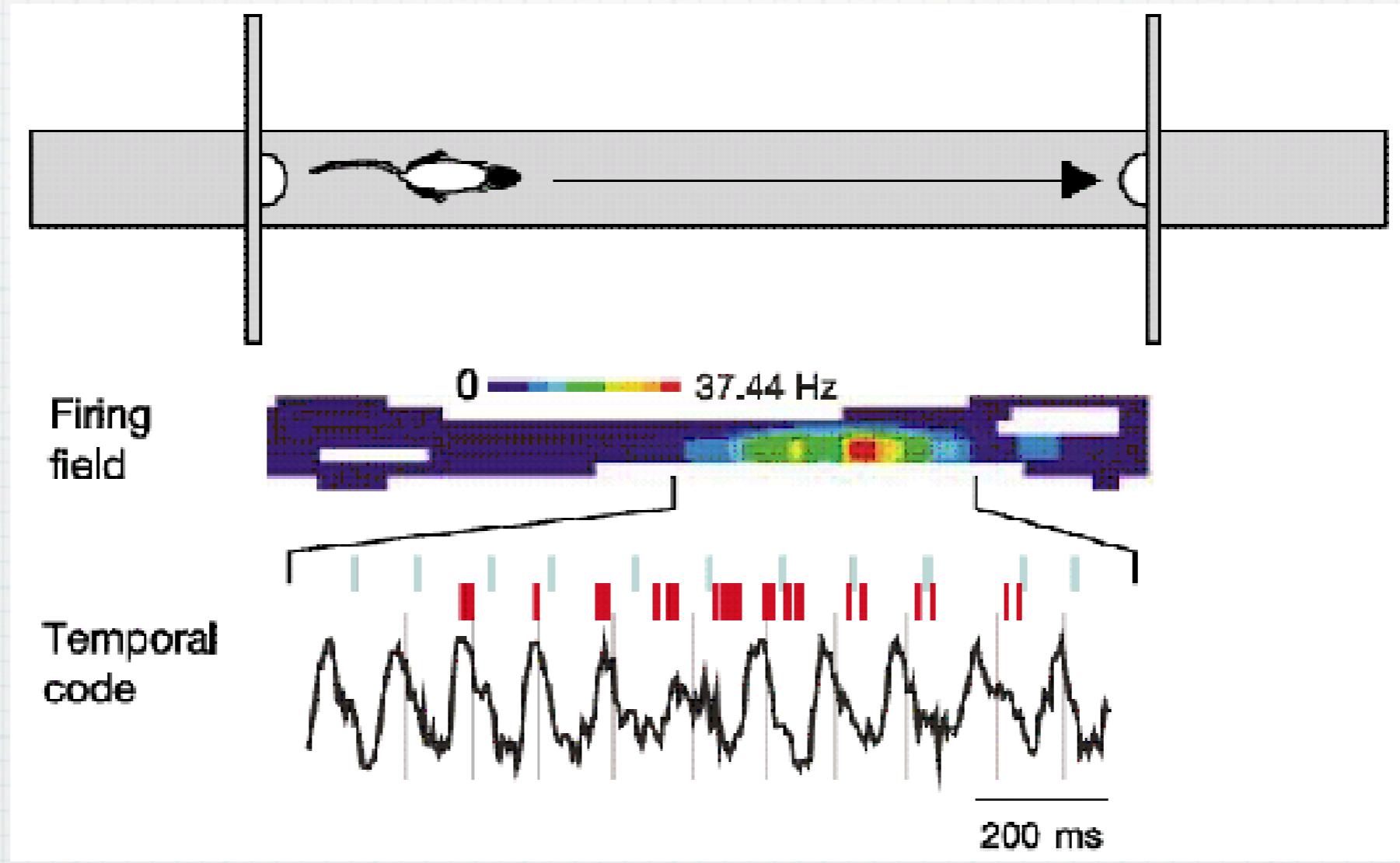
- Sleep
 - Generate activity that is independent of sensory input
 - May play roles in memory consolidation or reprioritization.
 - Spindles, delta, sharp-wave ripple complexes
- Awake behavior
 - Exploration – theta (6 - 12Hz)
 - Sensory binding & attention – gamma (30-80Hz)
 - Sensory discrimination – olfaction in insects

Attention in Visual cortex



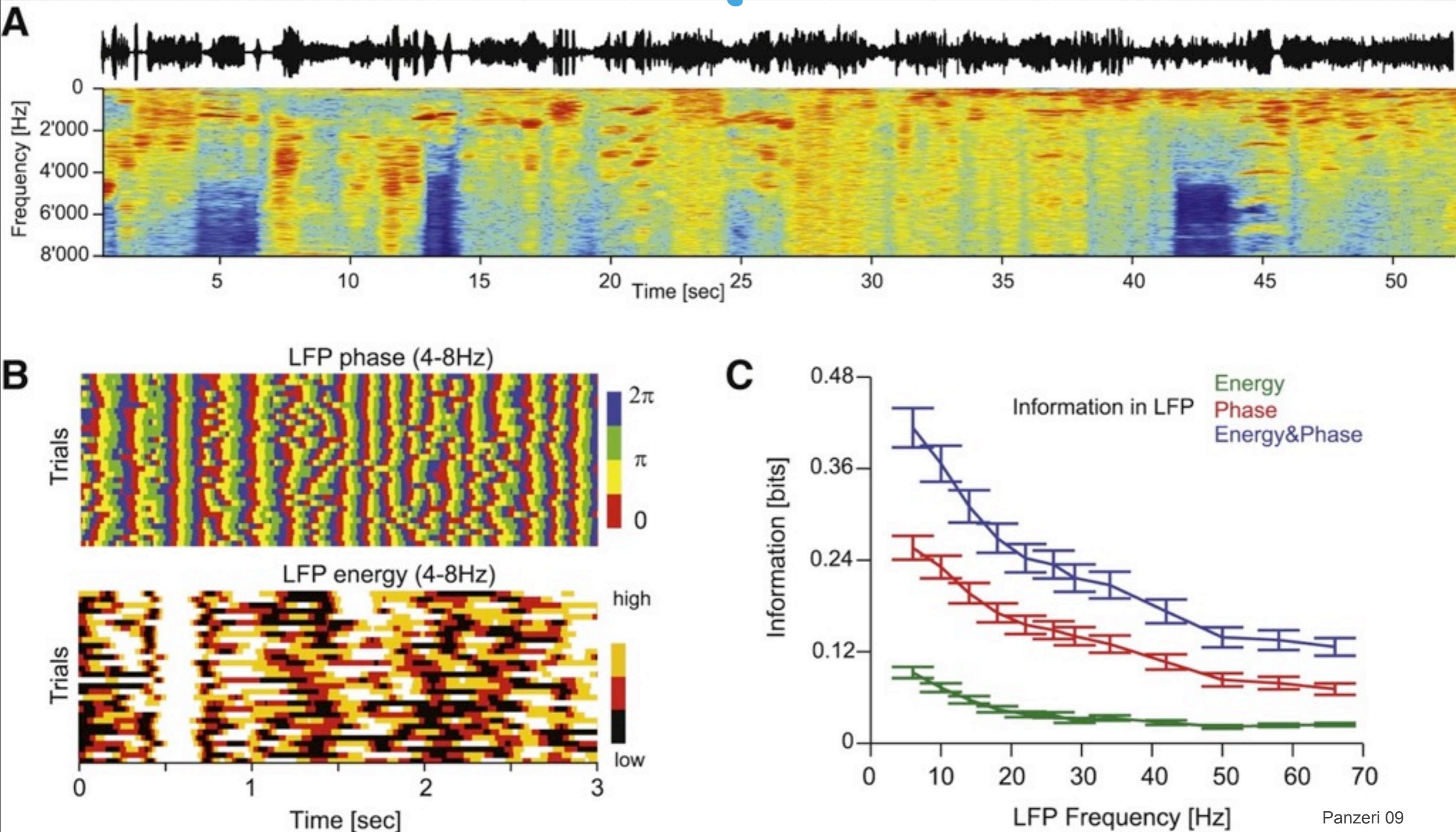
Sejnowski01, Steinmetz00

Phase precession in Hippocampus

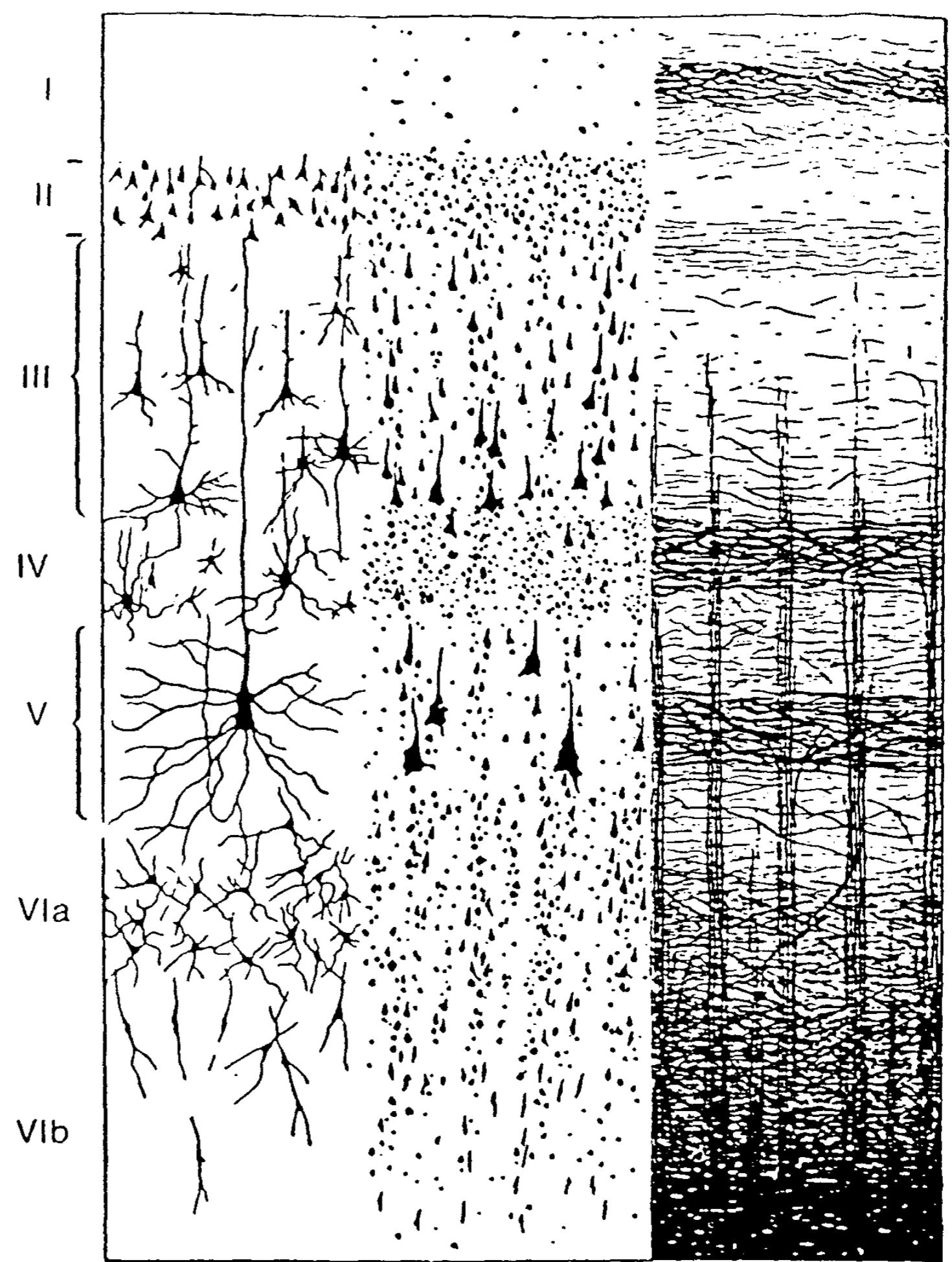
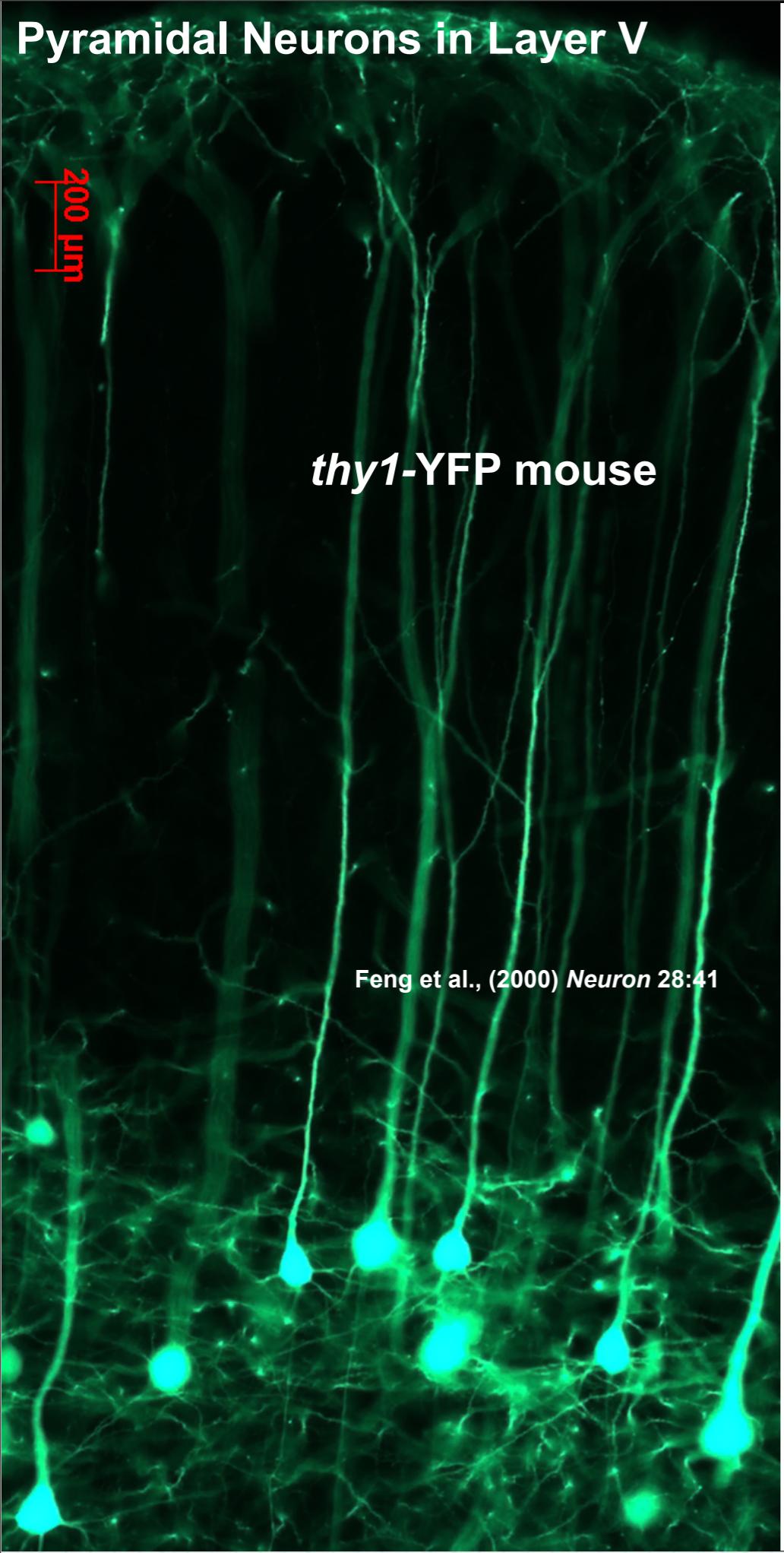


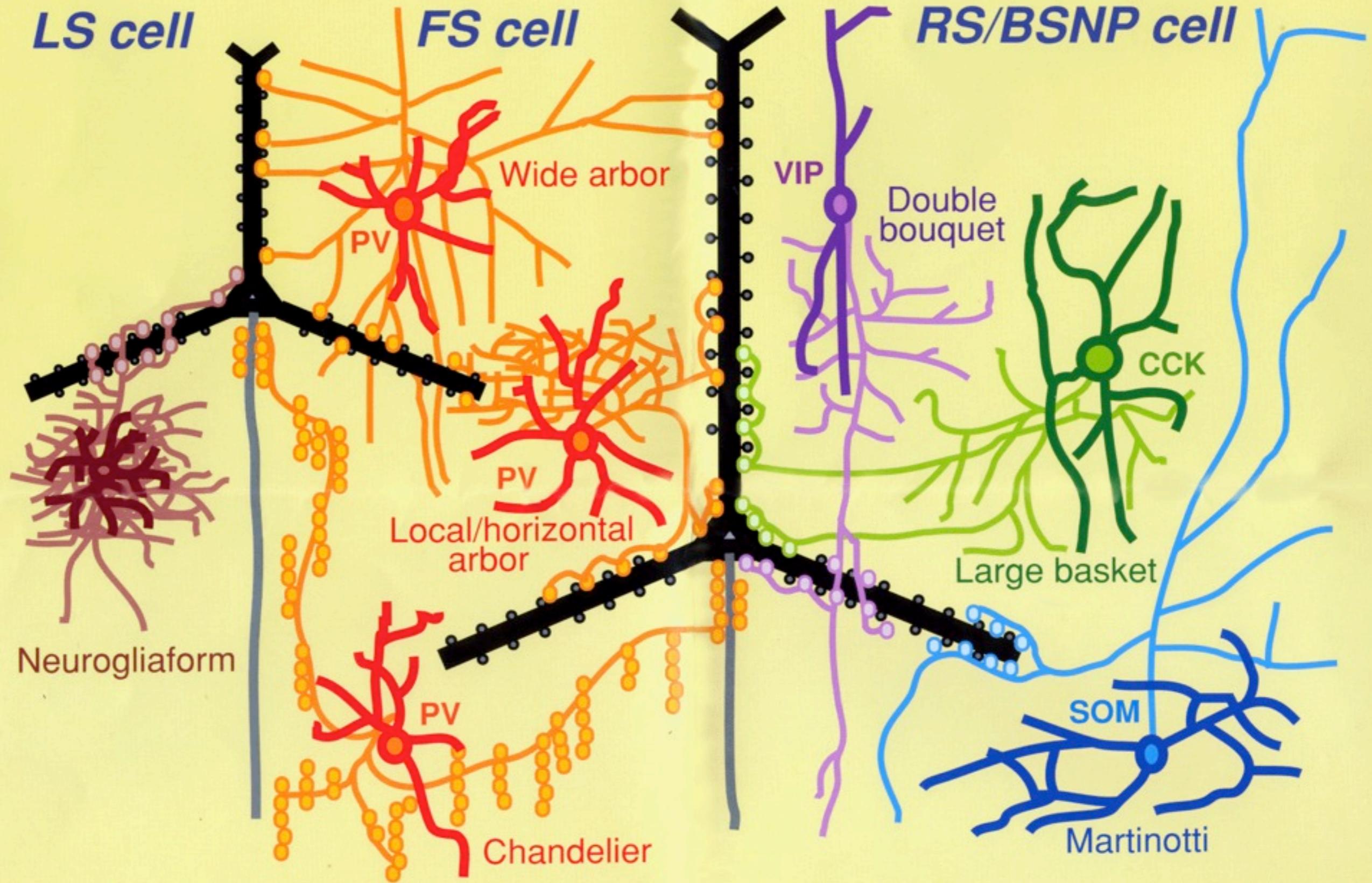
O'Keefe'03

Phase-coding in auditory cortex



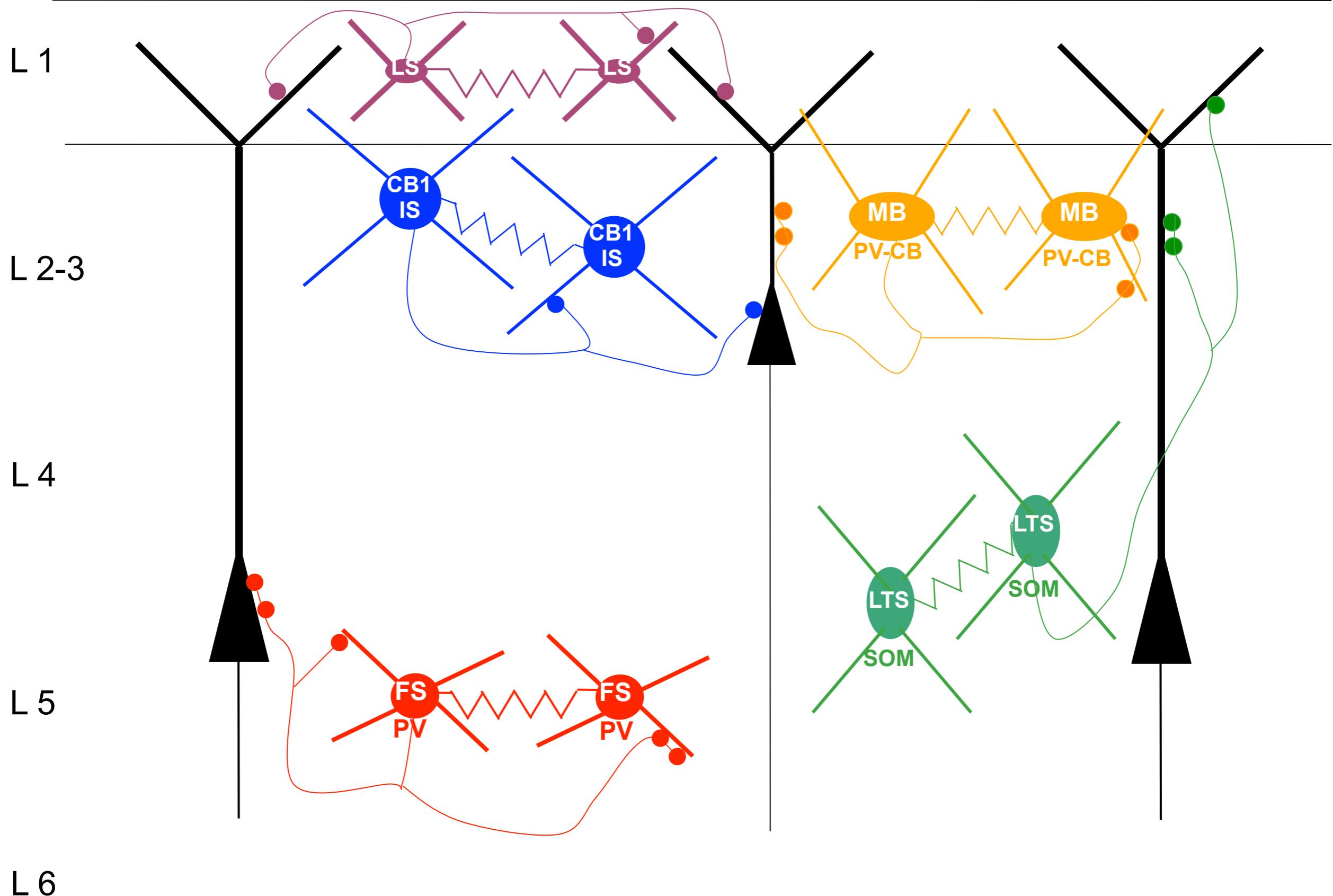
Pyramidal Neurons in Layer V





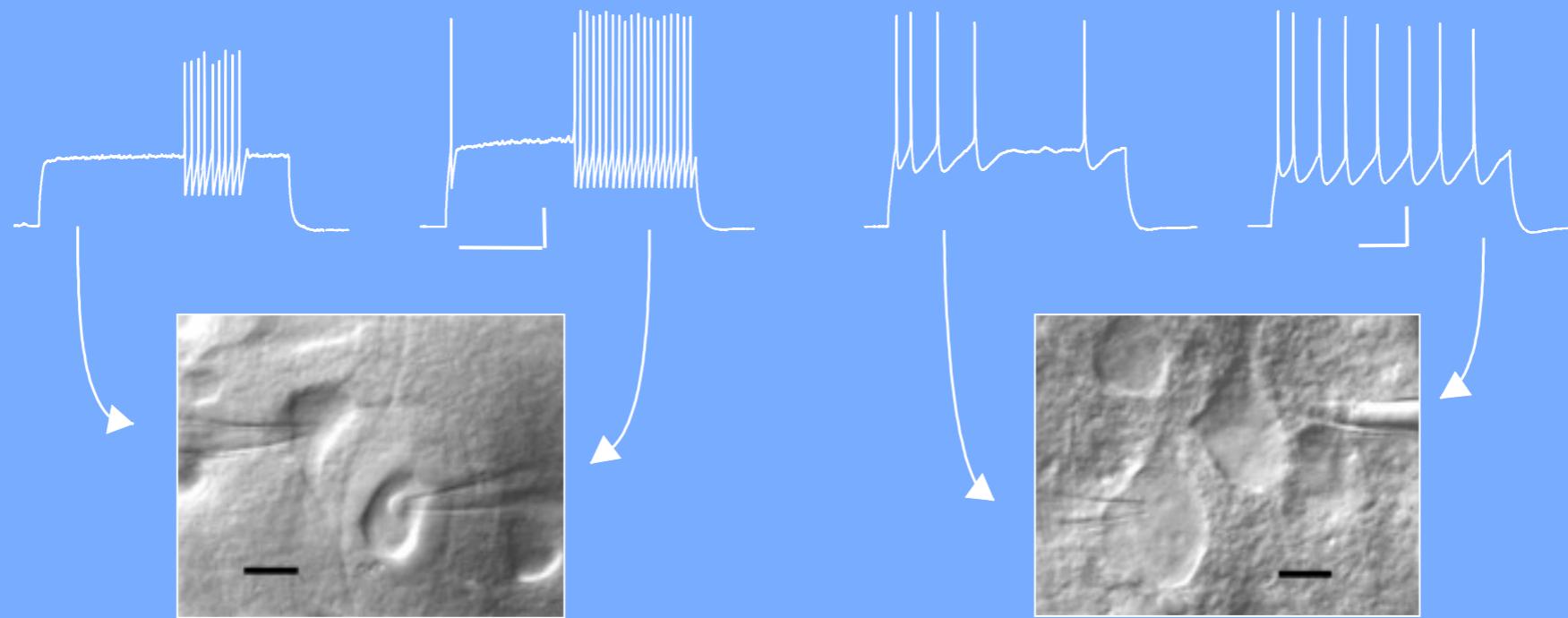
Kawaguchi, 2000

Five distinct networks of inhibitory neurons defined by electrical coupling

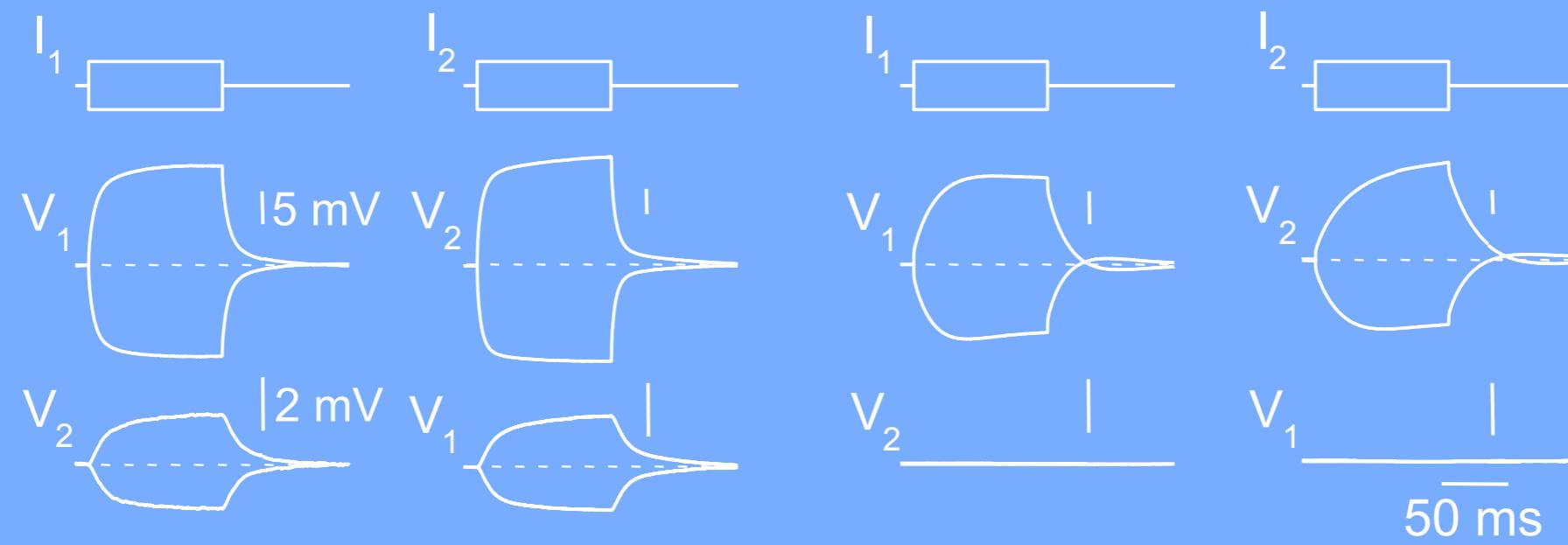


Shaul Hestrin

FS cells

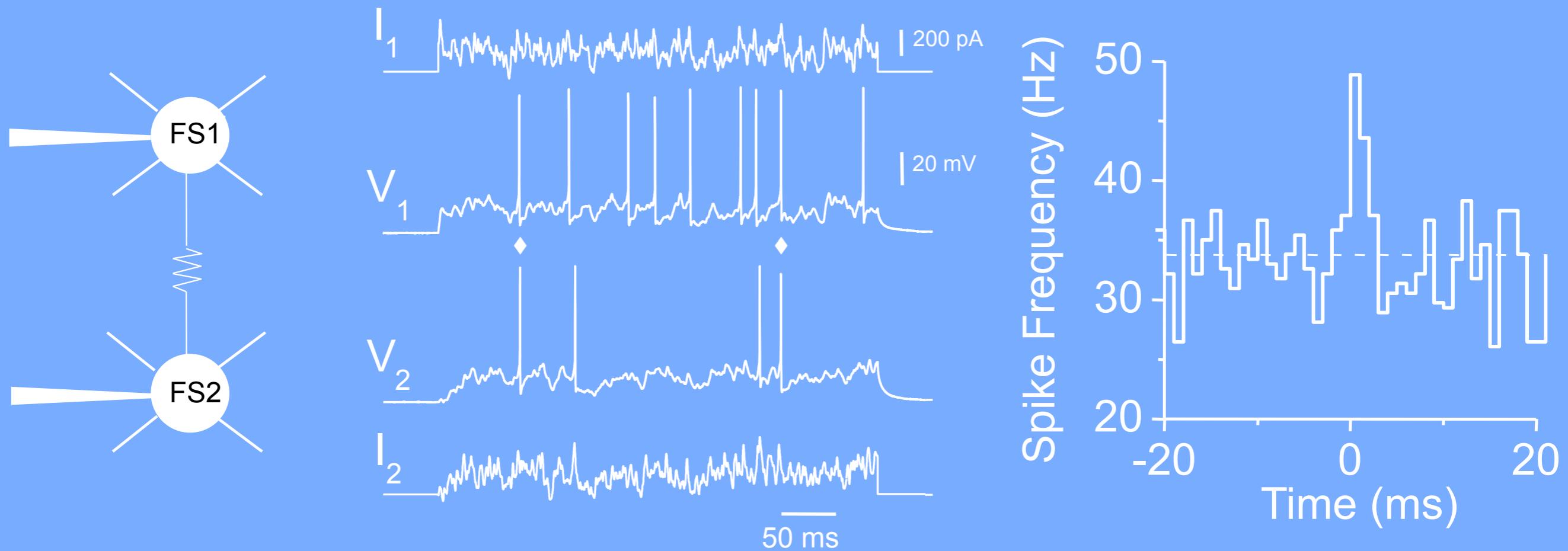


Pyramidal cells



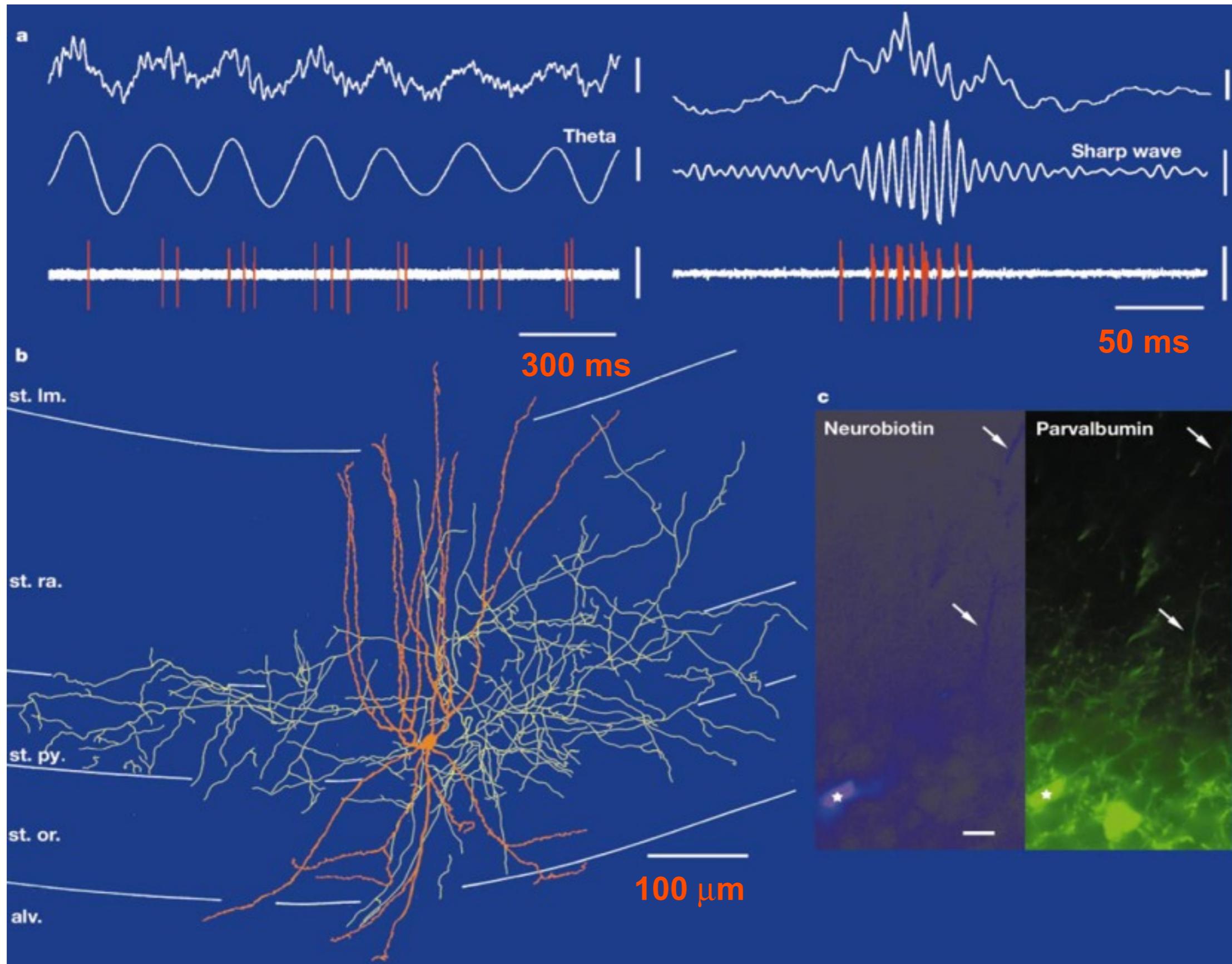
Galarreta & Hestrin, 1999

Synchronization via Electrical Synapses of FS Cells



Slide courtesy of Shaul Hestrin

Firing Patterns of a Parvalbumin-Positive Basket Cell



Klausberger et al., 2003

