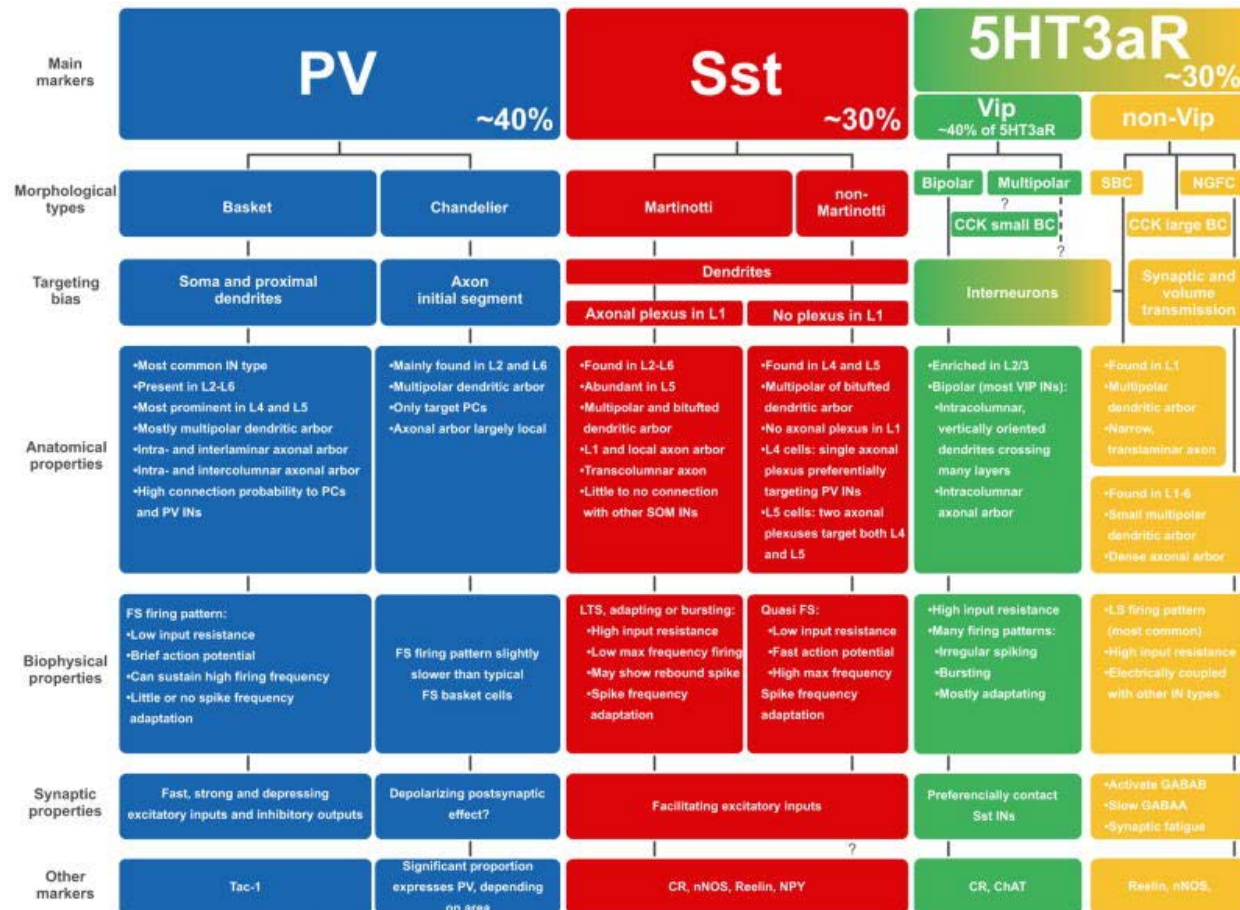


# Symposium – Cortical Disinhibitory Circuits: Cell Types, Connectivity, and Function

Lisa Topolnik and Klas Kullander

# Removing Tonic Inhibition - A Critical Role In Learning and Information Processing?

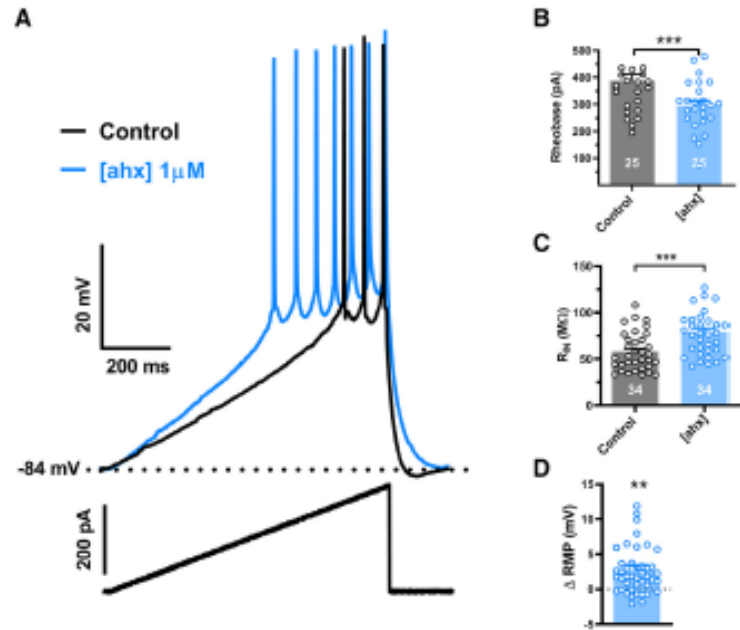


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## GABAergic interneurons in the neocortex: From cellular properties to circuits

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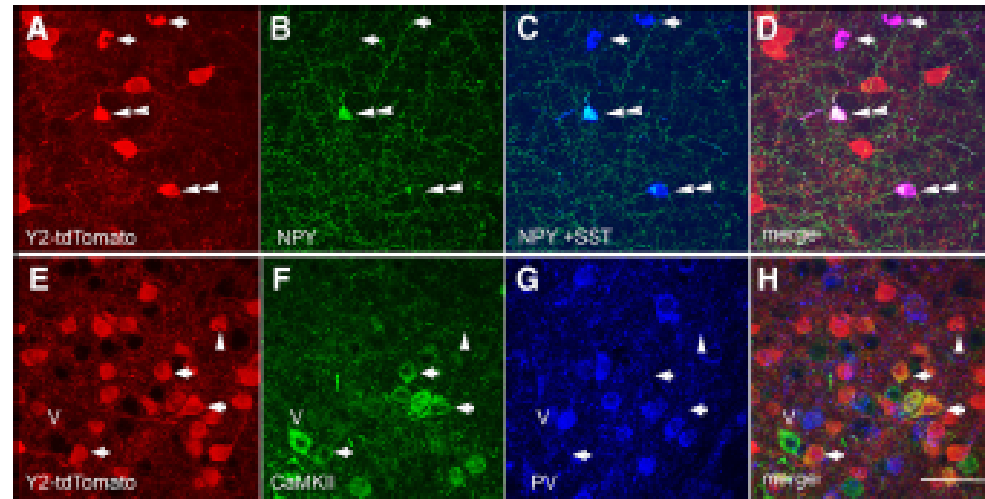
The Journal of Neuroscience, June 19, 2019 • 39(25):4909–4930 • 4909

Systems/Circuits

## NPY<sub>2</sub> Receptors Reduce Tonic Action Potential-Independent GABA<sub>B</sub> Currents in the Basolateral Amygdala

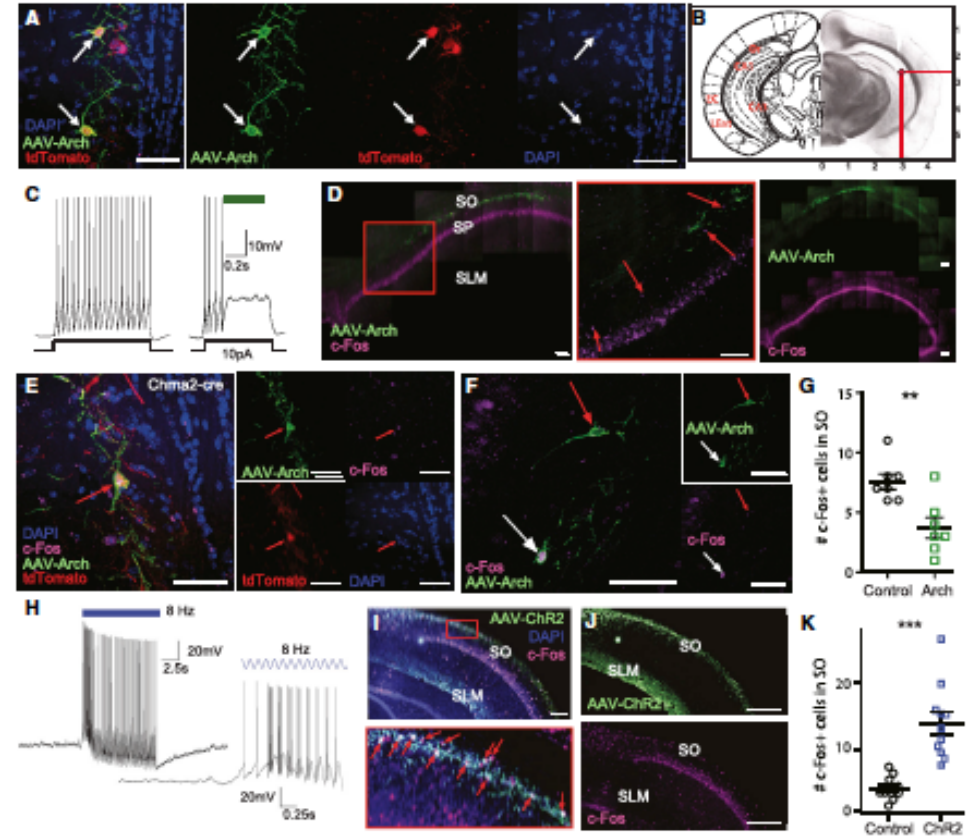
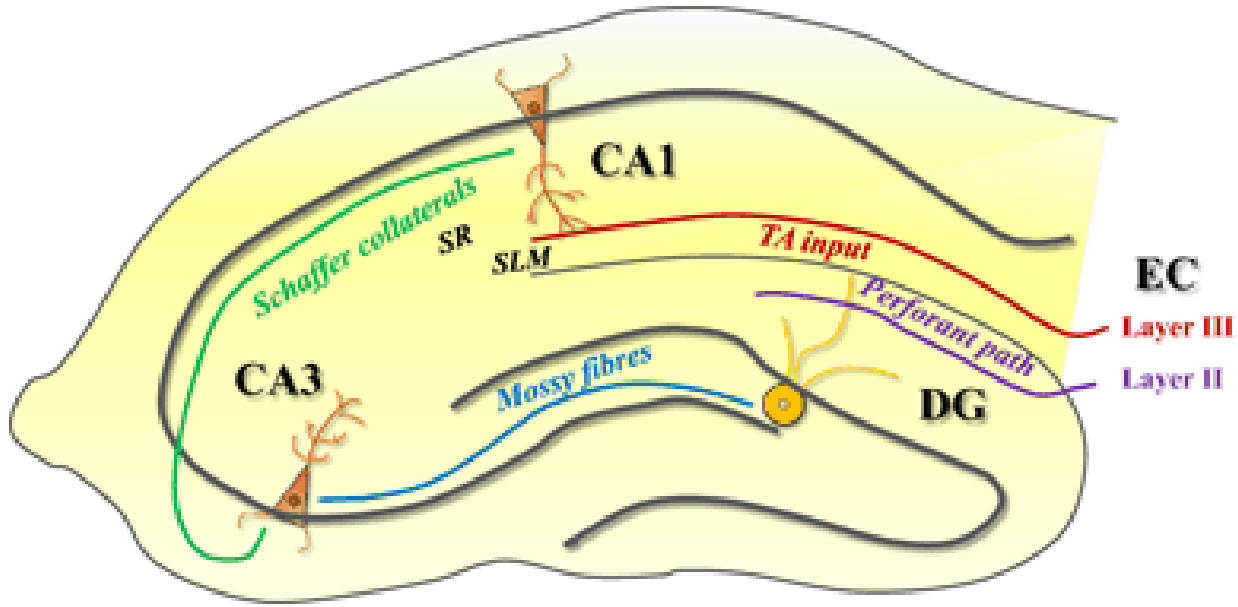
James P. Mackay,<sup>1</sup> Maria Bompalaki,<sup>2</sup> M. Regina DeJoseph,<sup>2</sup> Sheldon D. Michaelson,<sup>1</sup> Janice H. Urban,<sup>2</sup> and William F. Colmers<sup>1</sup>

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**Figure 14.** Coexpression of tdTomato immunoreactivity in NPY- and SST-immunoreactive INs and CaMKII-immunopositive neurons in the BLA. High magnification of tdTomato- (A), NPY- (B), and SST- (C) immunoreactive neurons in the BLA. D, The merged image indicates that tdTomato is expressed in NPY<sup>+</sup>/SST<sup>+</sup> (double arrowhead) and NPY<sup>-</sup>/SST<sup>+</sup> (arrows) neuronal populations. Subsets of tdTomato-immunoreactive cells (E) in the BLA also contain immunoreactivity for CaMKII (F, H, arrows) but not the interneuronal marker PV (G, H). Single-labeled cells for CaMKII (carat- v) and tdTomato (single arrowhead) are also present; in general, all (>99%) of the PV population is single-labeled with no significant coexpression with tdTomato. Scale bar, 100  $\mu$ m.

# Types of somatostatin interneurons seem to bias pyramidal neurons to subsets of inputs



## Neuron

### OLM $\alpha$ 2 Cells Bidirectionally Modulate Learning

- Highlights**
- OLM cells of the intermediate hippocampus express the nicotinic receptor  $\alpha 2$  subunit
  - Activation of intermediate OLM $\alpha$ 2 cells impairs object and fear-related memory encoding
  - Inhibition of intermediate OLM $\alpha$ 2 cells enhances object memory encoding
  - Dorsal and intermediate OLM cells differentially modulate learning

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#### In Brief

OLM cells have been previously shown to gate information flow into CA1 in vitro. Stewart et al. now show that OLM cells of the intermediate hippocampus can either enhance (upon inhibition) or impair (upon activation) memory encoding in freely moving mice.

Article

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Author manuscript  
*Nat Neurosci*. 2012 November; 15(11): 1524–1530. doi:10.1038/nn.3235.

### OLM interneurons differentially modulate CA3 and entorhinal inputs to hippocampal CA1 neurons

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OLMa2 Cells