# Supplementary Material

## Activity-Dependent Gating of Lateral Inhibition in the Mouse Olfactory Bulb

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# Supplementary Figure 1

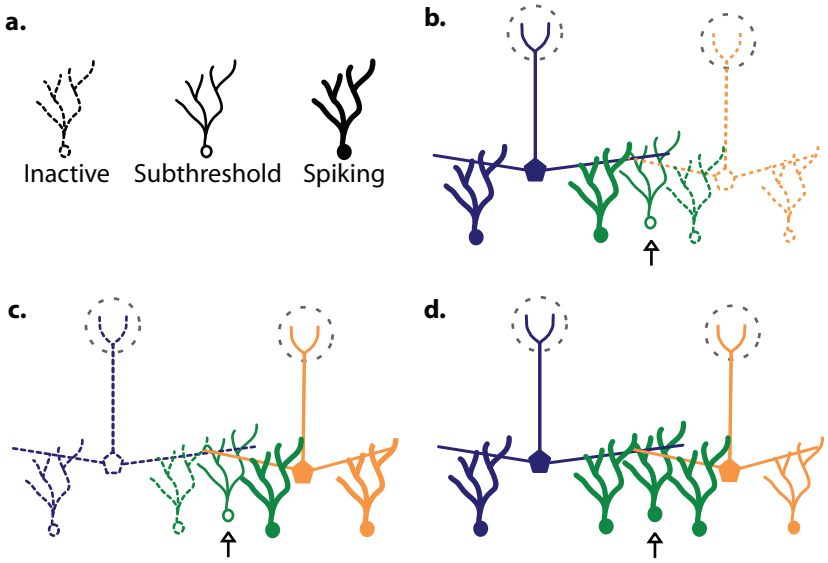


**Figure S1.** Schematic of proposed integration within the granule cell population. a) Legend showing how granule cells with different activity levels are depicted. Stimulation of an individual glomerulus (b and c) is insufficient to activate all of the common granule cells between the glomeruli. d) Simultaneous stimulation of both glomeruli results in summation of subthreshold inputs and an increase in activated granule cells (open arrow indicates granule cell activated by only coincident stimulation of both glomeruli).

# Supplementary Figure 2

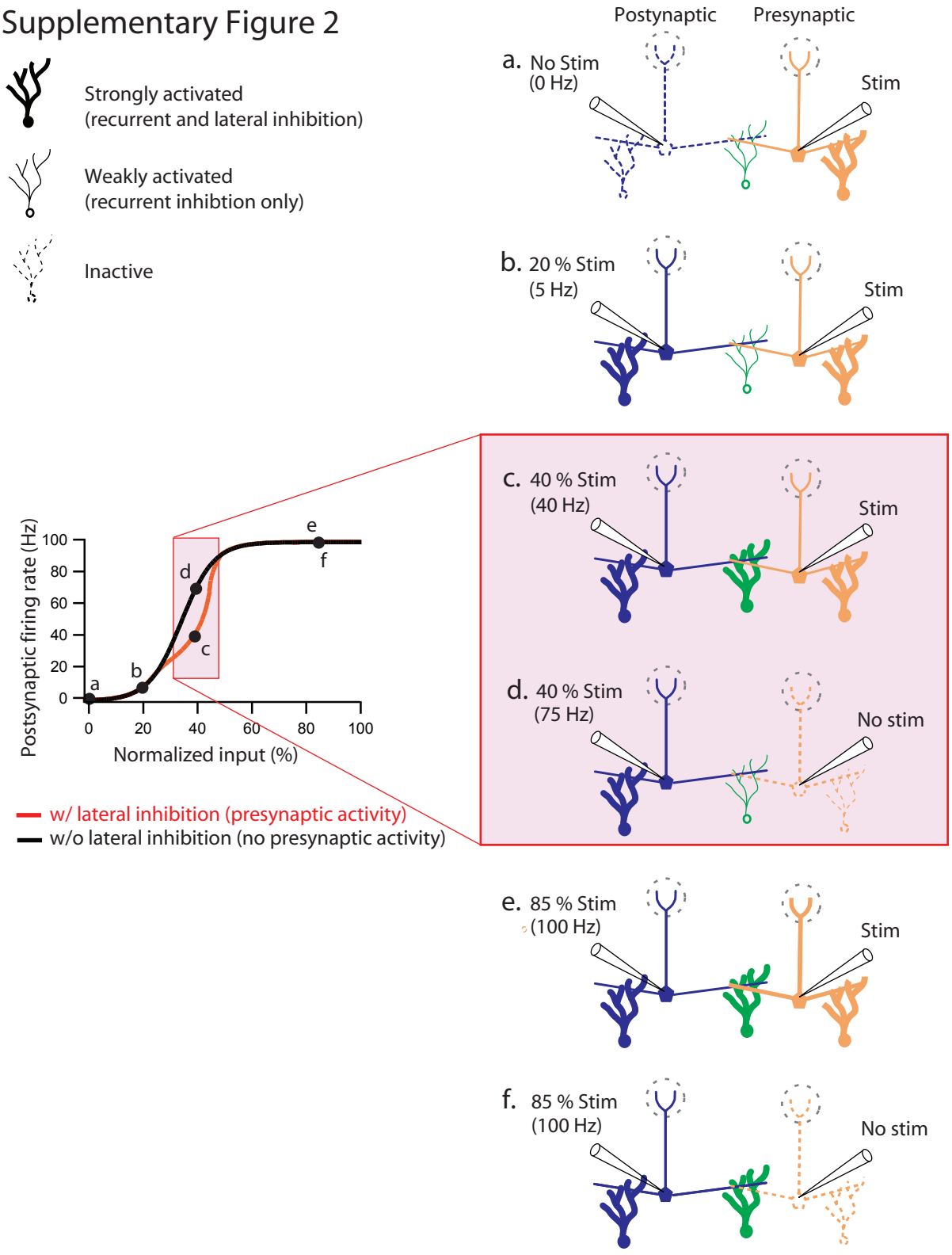


**Figure S2.** Schematic of proposed mechanism of activity-dependent lateral inhibition. Upper left: legend showing how granule cells with different activity levels are depicted. a-f) Schematics of olfactory bulb circuit showing pre- and postsynaptic mitral cells and associated granule cells. When the postsynaptic cell is unstimulated (a) or when this cell is firing at low rates (b), no shared granule cells are activated sufficiently to generate lateral inhibition. c) When the rate of the postsynaptic mitral cell is increased above some threshold, some shared granule cells are activated sufficiently to generate lateral inhibition. This granule cell activity depends on coincident activation of pre- and postsynaptic mitral cells (compare c and d). At sufficiently high rates of postsynaptic activity, the firing of one cell alone is sufficient to cause activity of the shared granule cells, rendering lateral inhibition functionally silent (e and f).

# Supplementary Figure 3

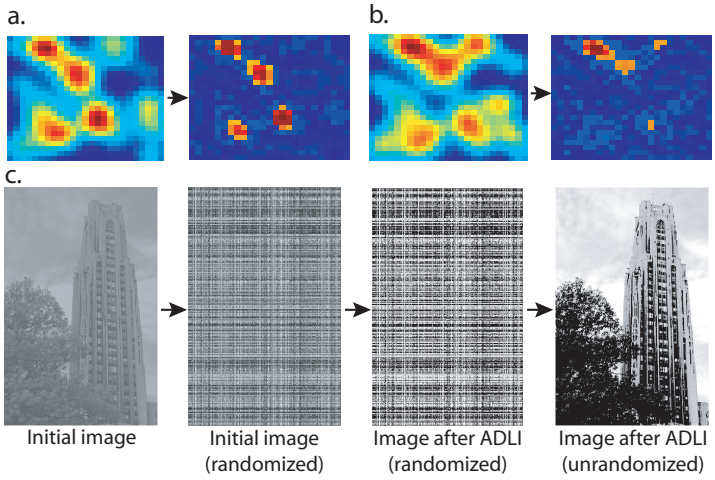


**Figure S3.** Similarity of olfactory input maps and randomization of image used in the computational model. a, b) Two initially correlated olfactory input maps (left panels) used in the model are less correlated after processing with activity-dependent lateral inhibition (right panels). c) To confirm that activity-dependent lateral inhibition does not require spatially structured input, we took the initial image (1st panel), randomized the pixels (2nd panel), then processed the randomized image with activity-dependent lateral inhibition (3rd panel). The image was unrandomized to reconstruct the initial image (4th panel) showing contrast enhancement.