Abstract Submitted
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Processing of odor stimuli by neuronal network models of the olfactory bulb[1] STUART WICK, Northwestern U., MARTIN WIECHERT, MPI for Medical Research, Heidelberg, HERMANN RIECKE, Northwestern U., RAINER FRIEDRICH, MPI for Medical Research, Heidelberg — The space of perceptable odors is high-dimensional and its representation in the various brain structures is still poorly understood. We focus on the olfactory bulb, which constitutes the first processing stage for odor stimuli after they have been sensed by receptor neurons. Experimentally it is found that the correlations between the outputs of the bulb are significantly reduced relative to those of the corresponding inputs, thus enhancing the discriminability of similar odors. We have generated a firing-rate-based network model with parameters derived from experimental data that reproduces decorrelation. Here we use this model to investigate the dependence of stimulus representations on odor concentration. We address the possibility of a change in perceived odor identity with changing concentration and the dependence of odor discriminability on odor concentration. We interpret some of our results within a simple mean-field model for the neural activity.

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