Table 1: List of the transgenic lines created for this study. Th: Tyrosine Hydroxylase, a marker for dopaminergic neurons. ChAT: choline acetyltransferase , a marker of acetylcholine neurons.

Figure 1: Immunohistochemistry on 70um vibratome horizontal sections of adult zebrafish brain, probed with antibodies against GFP and Tyrosine hydroxylase (Th) shows that the expression pattern of the transgenic line Th-itTA;TetO7:EGFP,recapitulates the endogenous th gene product. Anterior is to the left. Scale bar 100um, except for the last row showing Th and gfp-positive fibers in the Dp area , 25um.

Figure 2: Immunohistochemistry on 70um vibratome horizontal sections of adult zebrafish brain, probed with antibodies against GFP and Choline acetyltransferase (ChAT) shows that the expression pattern of the transgenic line Ch-itTA;TetO7:EGFP,recapitulates the endogenous ChAT gene product. Upper row: Telencephalon and optic tectum. Lower row: overview of the entire brain, showing expression in telencephalic areas, as well as in optic tectum and hindbrain. Anterior is to the left. Scale bar 500um.

Figure 3: Activation of Th-positive neurons expressing Channelrhodopsin (ChR2) in the OB by light stimulation. 2-photon images of Channelrhodopsin-EYFP expression (ChR2), also loaded with the calcium-sensitive dye that non-selectively labels all cells (Rhod-2). In the right panel, time-averaged spatial patterns of calcium signals from three trials are shown under 8Hz blue laser light illumination for the duration of 7sec. Bottom panels, DF/F plots for two neurons, one ChR2-positive (marked with blue arrowhead in the 2p images) and one Chr2-negative neuron (marked with green arrowhead in the 2p images), under no light stimulus or their activation under blue light illumination. Blue bar represents duration of blue laser stimulation at 8Hz.

Figure 4: Activation of Th-positive neurons in OB inhibits odor-evoked Dp neuronal responses. Time-averaged calcium signals of 30 neurons from three trials evoked from odor stimulation (10-5M Arginine, left) or odor stimulation and concomitant activation of Th-positive neurons in the OB (Arg + lightstim, right) as a function of time. Black bar: Odor stimulation (3 sec). Blue bar: laser light stimulation (7sec).