

Figure S1. Localized drug delivery into the glomerular layer under visual control using multi-photon microscopy.

The glass pipette (tip diameter $3 \mu\text{m}$) and the amount of the injection were visualized by co-loading the pipette with Texas Red (1 %). The dashed lines indicate the localization of the pipette. Texas Red accumulated extracellularly and around the glomerulus of interest (green, arrow).

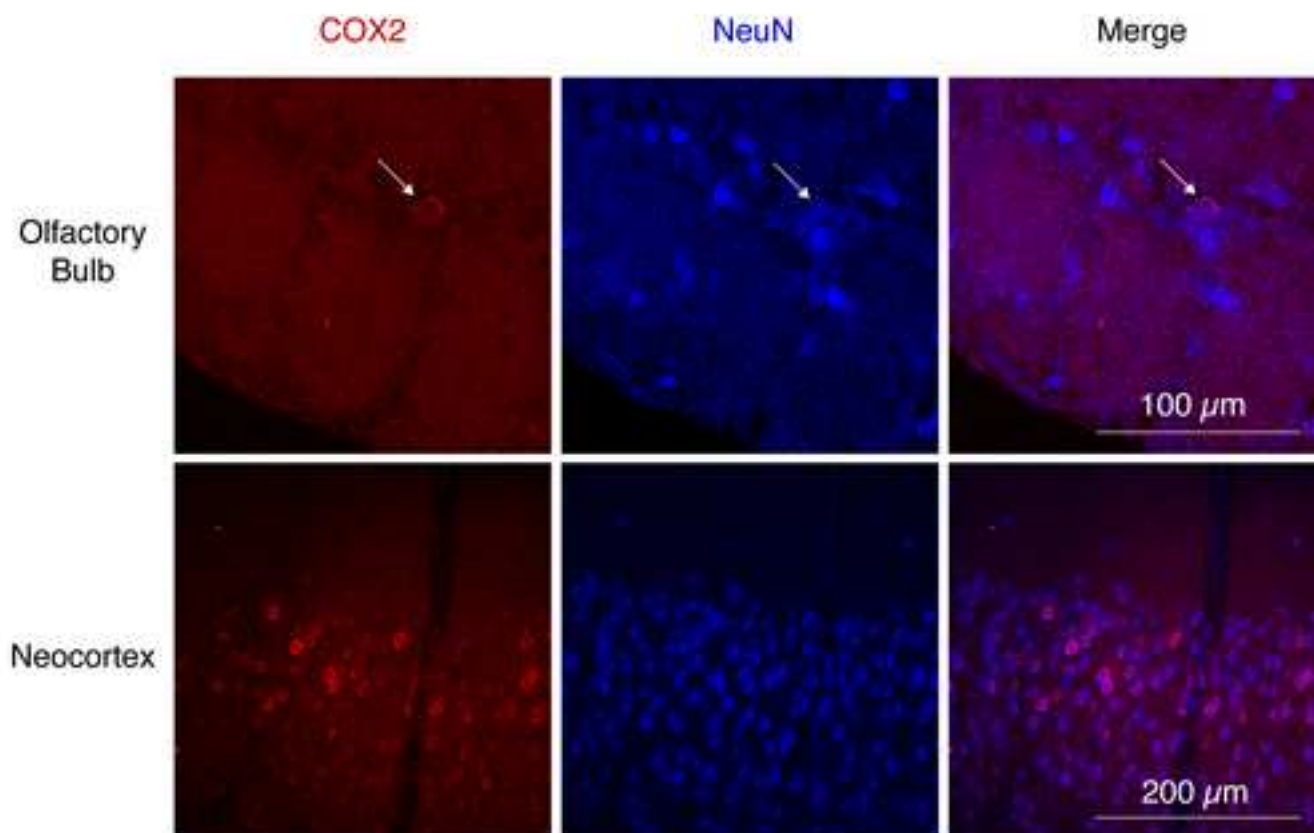


Figure S2. Sparse COX2 expression in the olfactory bulb compared to the neocortex.

Fixed sections (70 μm) were stained with antibodies against COX2 and the panneuronal marker neuron-specific nuclear protein (NeuN).

COX2 expression in the glomerular layer was sparse. On average, we detected 1-2 COX2-positive cells per glomerulus (arrow). COX2-expressing cells were neurons, as indicated by their co-labeling with NeuN, and were located at the lower border of the glomerular layer or within the upper external plexiform layer. No COX2 expression was observed in GFAP-positive astrocytes (data not shown). As positive control, we detected strong neuronal expression of COX2 in the neocortex as previously reported (Yamagata et al., 1993; Wang et al., 2005).

References

Wang, H., Hitron, I.M., Iadecola, C., and Pickel, V.M. (2005). Synaptic and vascular associations of neurons containing cyclooxygenase-2 and nitric oxide synthase in rat somatosensory cortex. *Cereb Cortex* 15, 1250-1260.

Yamagata, K., Andreasson, K.I., Kaufmann, W.E., Barnes, C.A., Worley, P.F. (1993). Expression of a mitogen-inducible cyclooxygenase in brain neurons: regulation by synaptic activity and glucocorticoids. *Neuron* 11, 371-386.

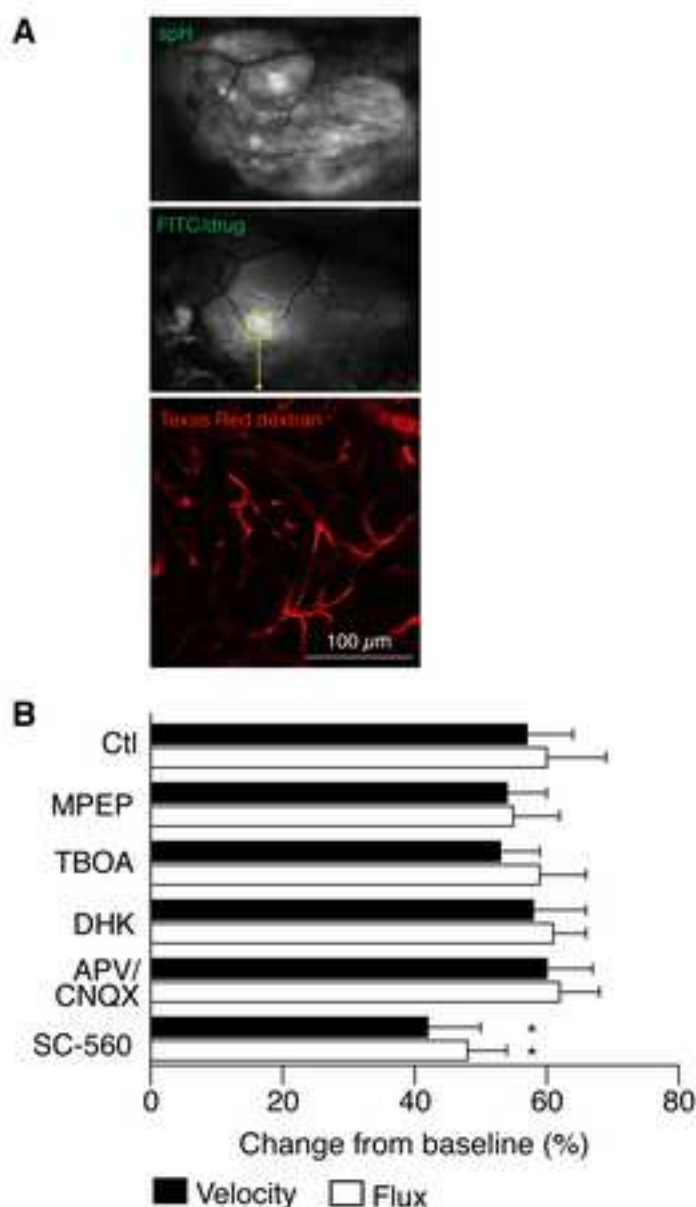


Figure S3. Vascular reactivity after drug application.

(A) Drugs were co-injected into the olfactory bulb with fluorescein isothiocyanate (FITC; 1 % in saline) to identify the region of interest. Bulbs were illuminated with blue light and imaged with a CCD camera. spH-positive glomeruli are visible before injection (upper image). After injection, FITC fluorescence delineates the region of drug application (middle image). Note that glomeruli appear very dim because FITC is several orders of magnitude more fluorescent than spH. Blood vessels (filled with Texas Red dextran) within the region of interest were visualized by multiphoton microscopy (lower image; $\sim 150 \mu\text{m}$ below pial surface).

(B) Vascular reactivity following an increase of tissue pCO_2 , induced by application of the carbonic anhydrase inhibitor acetazolamide. Velocity and flux increased shortly after administration. No significant differences were observed following local microinjection of MPEP, TBOA, dihydrokainate (DHK), or APV/CNQX, but SC-560 decreased pCO_2 (mean \pm s.e.m.; * $p < 0.05$, Student's t-test).

Table S1. List of odorants (nominal volumetric concentration 1 % (v/v) in mineral oil).

Number	Odorant
1	peppermint oil
2	ethyl tiglate
3	1-propanethiol
4	valeric acid
5	2-heptanone
6	allyl tiglate
7	p-anisaldehyde
8	ethyl valerate
9	isoamyl acetate
10	methyl tiglate
11	isobutyl amine
12	isoamyl amine
13	hexanoic acid
14	2-hexanone
15	acetal
16	isobutyl propionate
17	octanal
18	oil of nutmeg
19	pyridine
20	hexanal
21	octanoic acid
22	ethyl butyrate
23	acetophenone
24	ethyl benzoylacetate
25	eugenol