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**Supplemental information**

**Rapid fluorescent vital  
imaging of olfactory epithelium**

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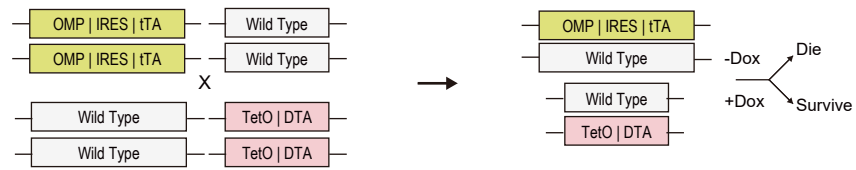


Figure S1. Breeding strategy for generation of OMP-tTA;TetO-DTA transgenic mice, Related to STAR methods.

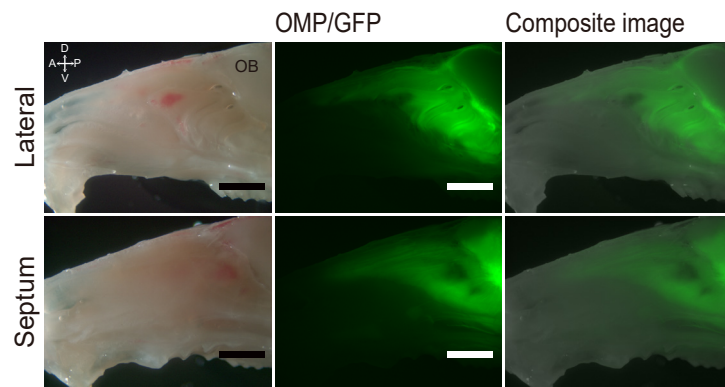


Figure S2. Fluorescent image of nasal lining from OMP-GFP mouse, Related to STAR Methods.

D = dorsal, V = ventral, A = anterior, P = posterior, OB = olfactory bulb. Scale bars = 2 mm.

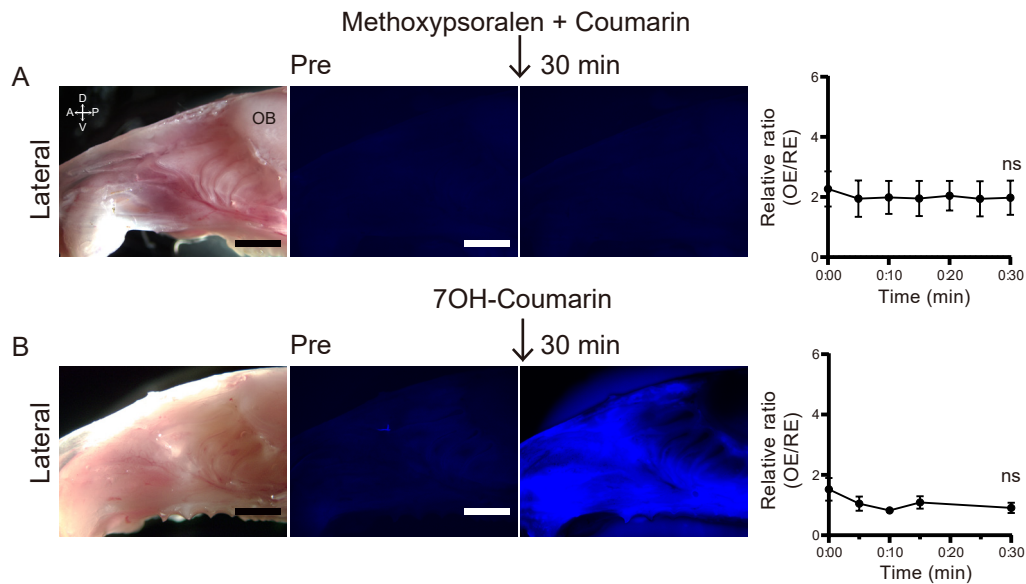


Figure S3. Vital imaging of nasal mucosa incubated with CYP2A6 inhibitor and coumarin metabolites, Related to Figure 2.

(A) Vital imaging of nasal mucosa incubated with CYP2A6 inhibitor methoxy-psoralen and coumarin. Graph shows relative fluorescence intensity of nasal mucosa (OE/RE) every 5 minutes after application of methoxy-psoralen and coumarin (n=3). (B) Vital imaging of nasal cavity loaded with 1 mM 7OH coumarin captured after 30 minutes. Relative fluorescence intensity of nasal mucosa (OE/RE) in every 5 minutes after application of 7OH coumarin (n=3). The data are shown as the mean  $\pm$  SEM (n=3). Statistical differences were calculated in initial time vs 30 min. D = dorsal, V = ventral, A = anterior, P = posterior, OB = olfactory bulb. Scale bars = 2 mm.

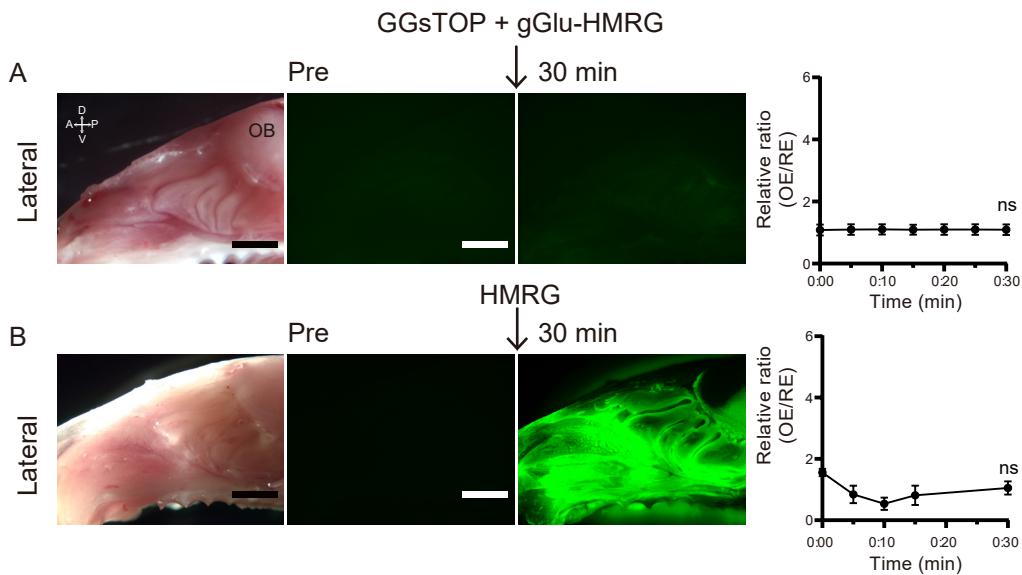


Figure S4. Vital imaging of nasal mucosa incubated with GGT inhibitor and gGlu-HMRG metabolites, Related to Figure4. (A) Vital imaging of nasal mucosa incubated with GGT inhibitor GGs TOP and gGlu-HMRG. Relative fluorescence intensity of nasal mucosa (OE/RE) every 5 minutes after application of coumarin (n=3). (B) Images of nasal cavity loaded with 1  $\mu$ M HMRG were captured after 30 minutes. Relative fluorescence intensity of nasal mucosa (OE/RE) in every 5 minutes after application of HMRG (n=3). The data are shown as the mean  $\pm$  SEM (n=3). Statistical differences were calculated in initial time vs 30 min. D = dorsal, V = ventral, A = anterior, P = posterior, OB = olfactory bulb. Scale bars = 2 mm.

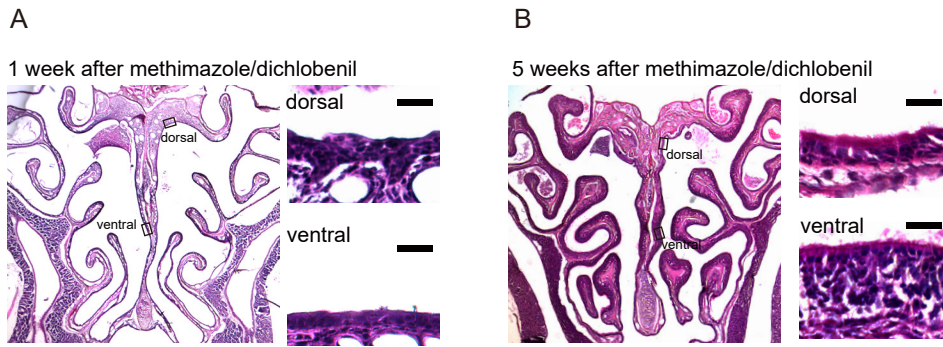


Figure S5. Histology of dichlobenil and methimazole affected mouse, Related to Figure 5.

(A) Hematoxylin and eosin (H&E) staining of coronal section of nasal cavity with higher magnification insets 1 week after injection of dichlobenil/methimazole. Scale bars = 25  $\mu\text{m}$ . (B) Hematoxylin and eosin (H&E) staining of coronal section of nasal cavity with higher magnification insets 5 weeks after injection of dichlobenil/methimazole. Scale bars = 25  $\mu\text{m}$ .

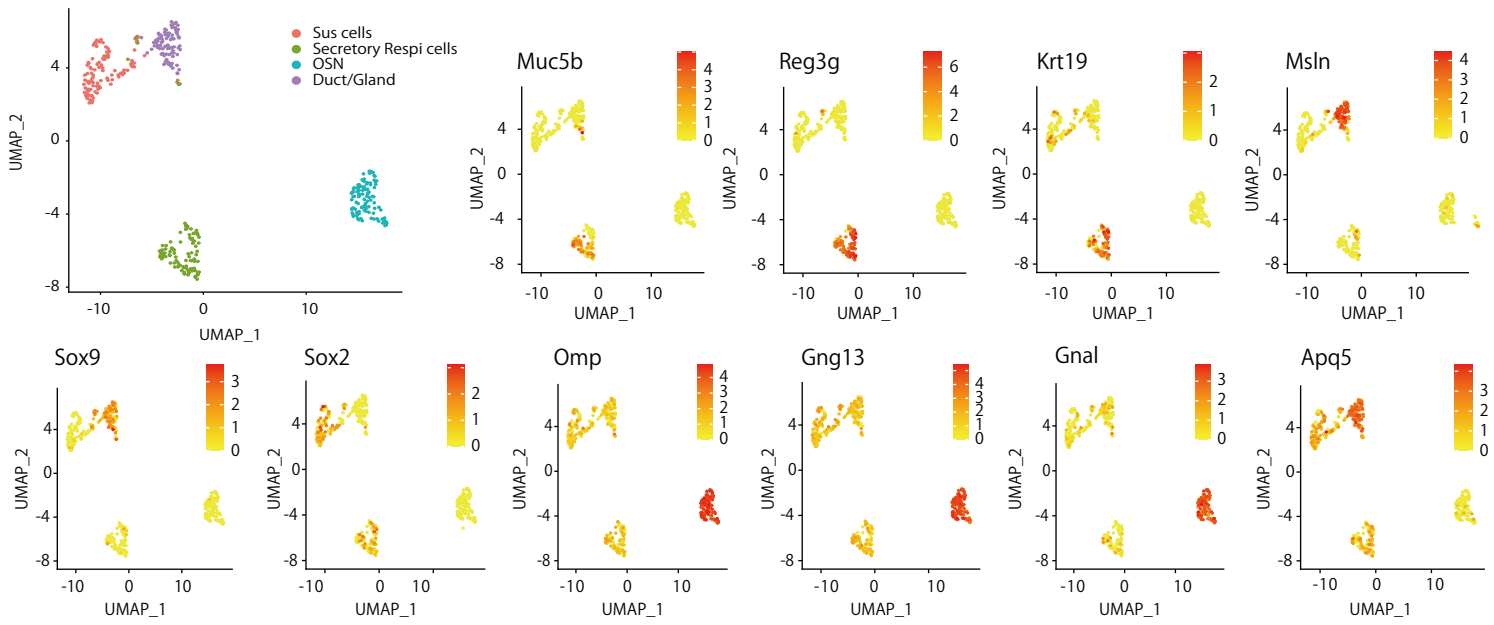


Figure S6. Cell type identification for single cell RNA sequencing in mouse nasal mucosa, Related to Figure 1, Figure 3. Cell type identification by known cell-type specific markers in UMAP (Uniform Manifold Approximation and Projection) for each of the known marker genes of single cell RNA sequencing data from the mouse nasal mucosa.

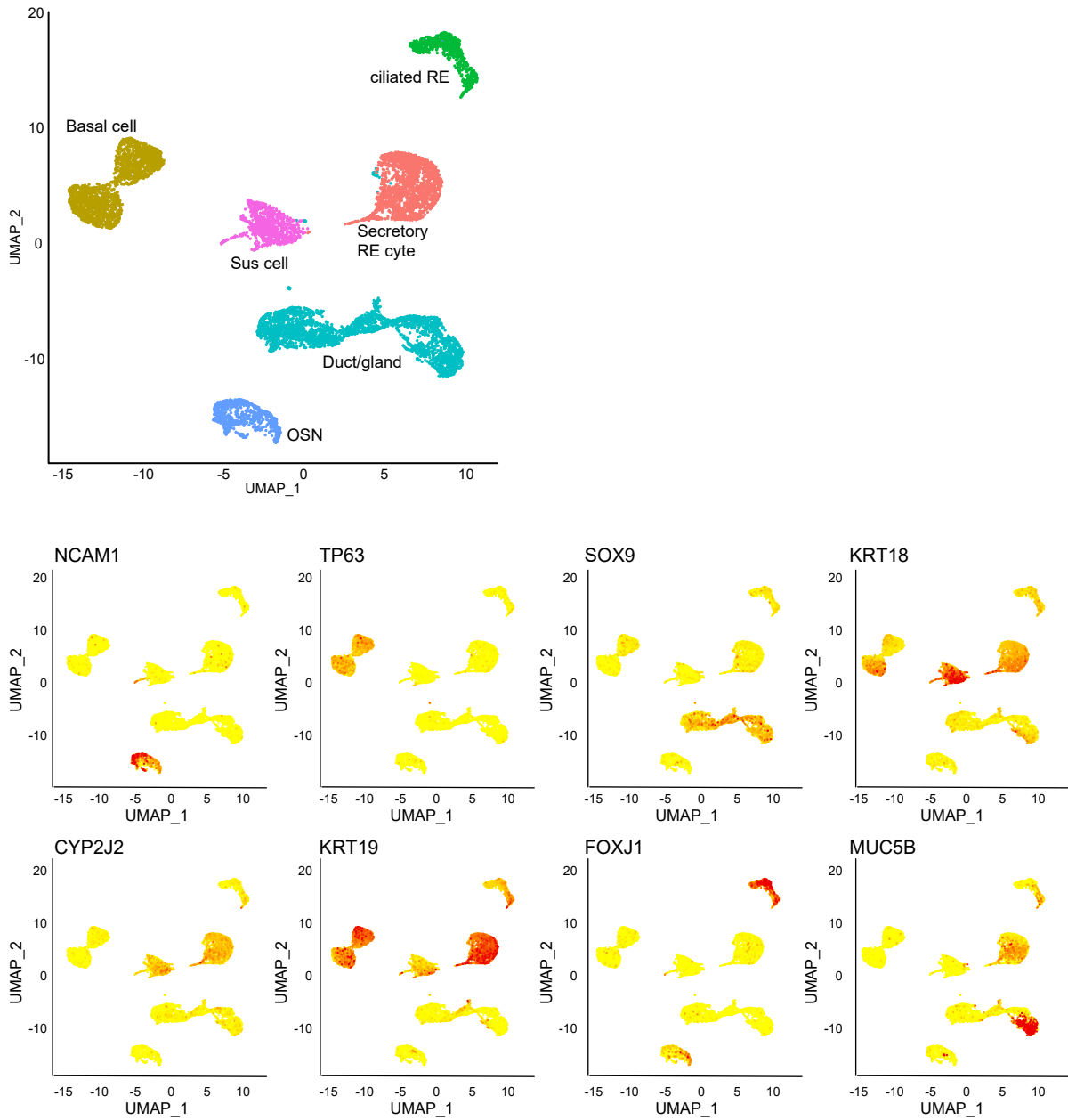


Figure S7. Cell type identification for single cell RNA sequencing in human nasal mucosa, Related to Figure 3. Cell type identification by known cell-type specific markers in UMAP (Uniform Manifold Approximation and Projection) for each of the known marker genes of single cell RNA sequencing data from the human nasal mucosa.