

Figure S1. SOX2 function in progenitors is required non-cell autonomously for taste bud survival.

(A) SOX2 expression is evident in IG, PG and FFP compartments of almost all control taste buds (gray bars). Following *Sox2* deletion at days 1, 2, and 7, the majority of taste buds lack SOX2⁺ PG and FFP cells, yet maintain IG SOX2 expression (cyan, green, blue bars). By 11 days following induction (magenta bars), most of the few remaining taste buds lack IG, PG and FFP SOX2-ir. (B-E) Morphologically distorted and small taste buds (K8, red) express SOX2 (green) only within the taste buds. (F-G) Only a quarter of small taste buds have IG and PG SOX2⁺ cells. (H-I) Morphologically normal taste buds maintained SOX2 expression in IG, PG and FFP regions. Nuclei are counterstained with Draq5 (blue). B-I are compressed confocal *z*-stacks. Scale bar = 10µm for B-I. *N*=3-4 mice per condition. Data are represented as mean ± SD. Two-way ANOVA; **P*<0.05, ***P*<0.01, ****P*<0.001, *****P*<0.0001.

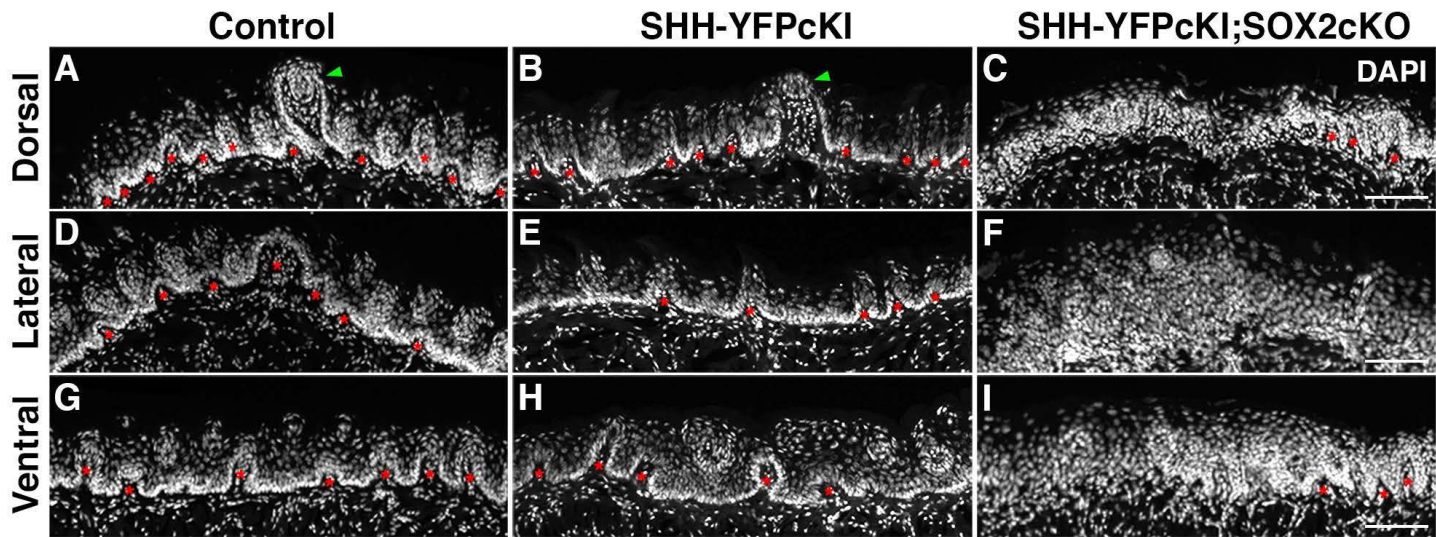


Figure S2. SHH overexpression in SOX2cKO lingual progenitors leads to disorganized epithelia in all regions of the tongue.

(A, D, G) Dorsal (A), lateral (D) and ventral (G) epithelium, shown in tranverse sections of control tongue, is composed of non-taste epithelium interspersed with large and small epithelial invaginations (red asterisks) that form part of filiform papillae and fungiform papillae (green arrowhead). Tightly packed basal epithelial cells (Dapi, white) delimit the border between epithelium and lamina propria (lingual mesenchyme). (B, E, H) SHH overexpression in K14⁺ progenitors (SHHcKI) does not affect lingual epithelial morphology; FFP (green arrowhead) and non-taste epithelial invaginations (red asterisks). (C, F, I) All regions of the tongue in SHHcKI;SOX2cKO mice have distorted epithelial architecture, including marked reduced epithelial invaginations (red asterisks), thickened epithelium, and an indistinct border between lingual epithelium and the lamina propria. Scale bars = 100 μ m. Nuclei are counterstained with DAPI.