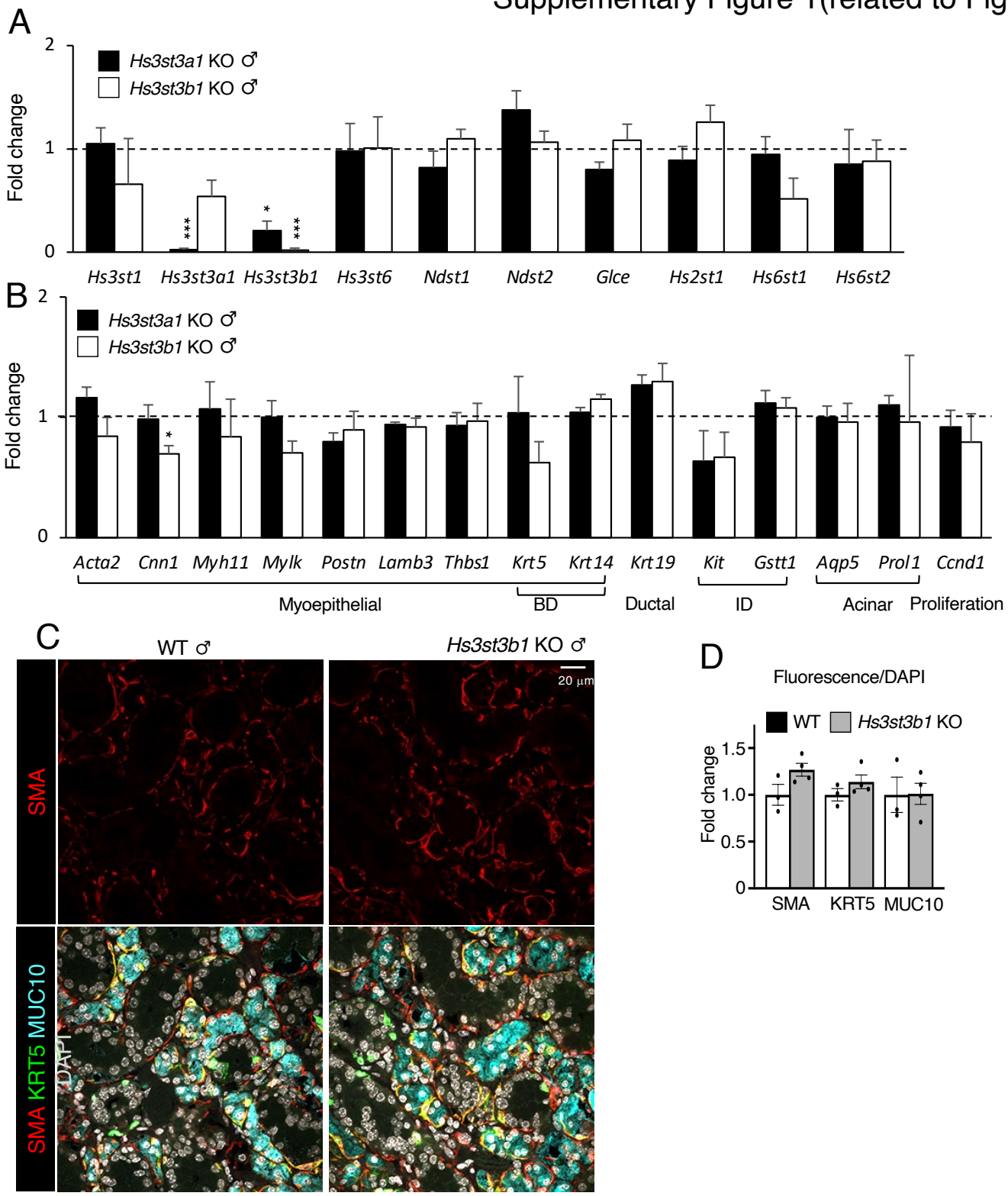
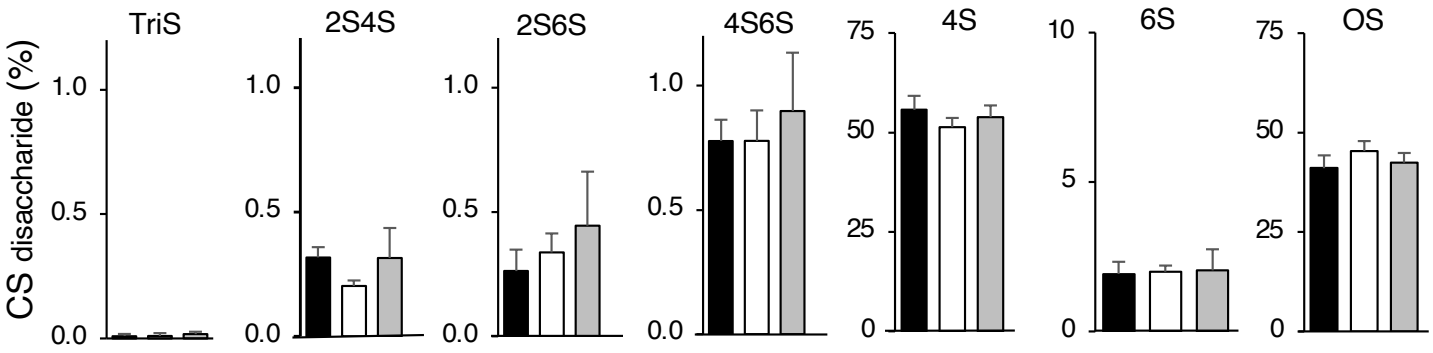
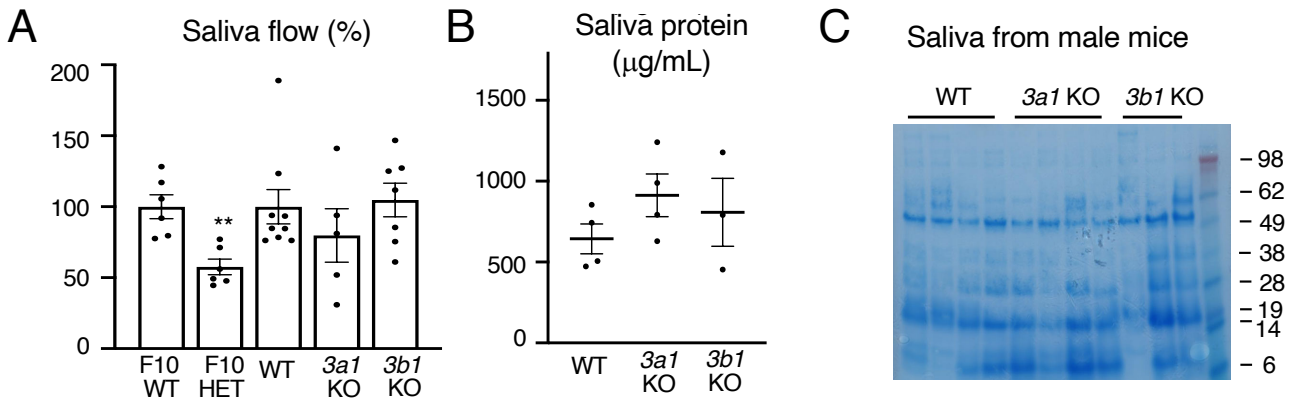


Supplementary Figure 1. Gene expression changes in HS biosynthetic enzymes and different cell type markers in adult *Hs3st3a1* and *Hs3st3b1* KO SMGs compared to WT.

(A-B) Gene expression in adult male SMGs. Gene expression was normalized to wildtype control (dotted line) and *Rps29*. Error bars: SEM. One-way ANOVA compared to WT, * $p < 0.05$, ** $p < 0.01$ and *** $p < 0.001$. (C) Representative images of single confocal sections from WT and *Hs3st3b1* KO SMGs showing KRT5 (green), SMA (red), MUC10 (cyan) and nuclei (gray). Scale bar: 20 µm. (D) Quantification of fluorescence intensity normalized to total nuclei staining and expressed as a fold change compared to WT. Three SMGs with at least 5 different positions were imaged and used for quantification. Error bars: SEM. One-way ANOVA compared to WT, not significant.



Supplementary Figure 2. Composition of CS disaccharides in adult SMGs. Analysis of CS disaccharide composition between WT, *Hs3st3a1* KO and *Hs3st3b1* KO SMGs. All data were averaged. Error bars: SD. One-way ANOVA compared to WT, * $p < 0.05$. N = 4 for each group.



Supplementary Figure 3. *Hs3st3a1* and *Hs3st3b1* KO male mice do not show any differences in saliva flow and saliva protein compared to WT.

(A) Salivary flow rates in adult male mice were determined following collection of whole saliva after pilocarpine stimulation. Saliva flow normalized to the WT and shown as %. Mean ± SEM. Dots represent saliva measurements of individual mice. Unpaired t-test for FGF10 HET, ** $P < 0.01$, as compared to FGF10 WT. One-way ANOVA for *Hs3st3a1* KO and *Hs3st3b1* KO compared to WT, not significant (C) Quantification of protein concentration in saliva from male mice assessed using BCA assay. Graph shows Mean ± SEM. Dots represent measurements of individual mice. No significant differences detected compared to WT littermates. (C) Saliva (15 μl) from male (C) mice displayed no obvious differences in protein expression profiles of saliva in 4-12% gradient SDS-polyacrylamide gels stained with Coomassie Blue.