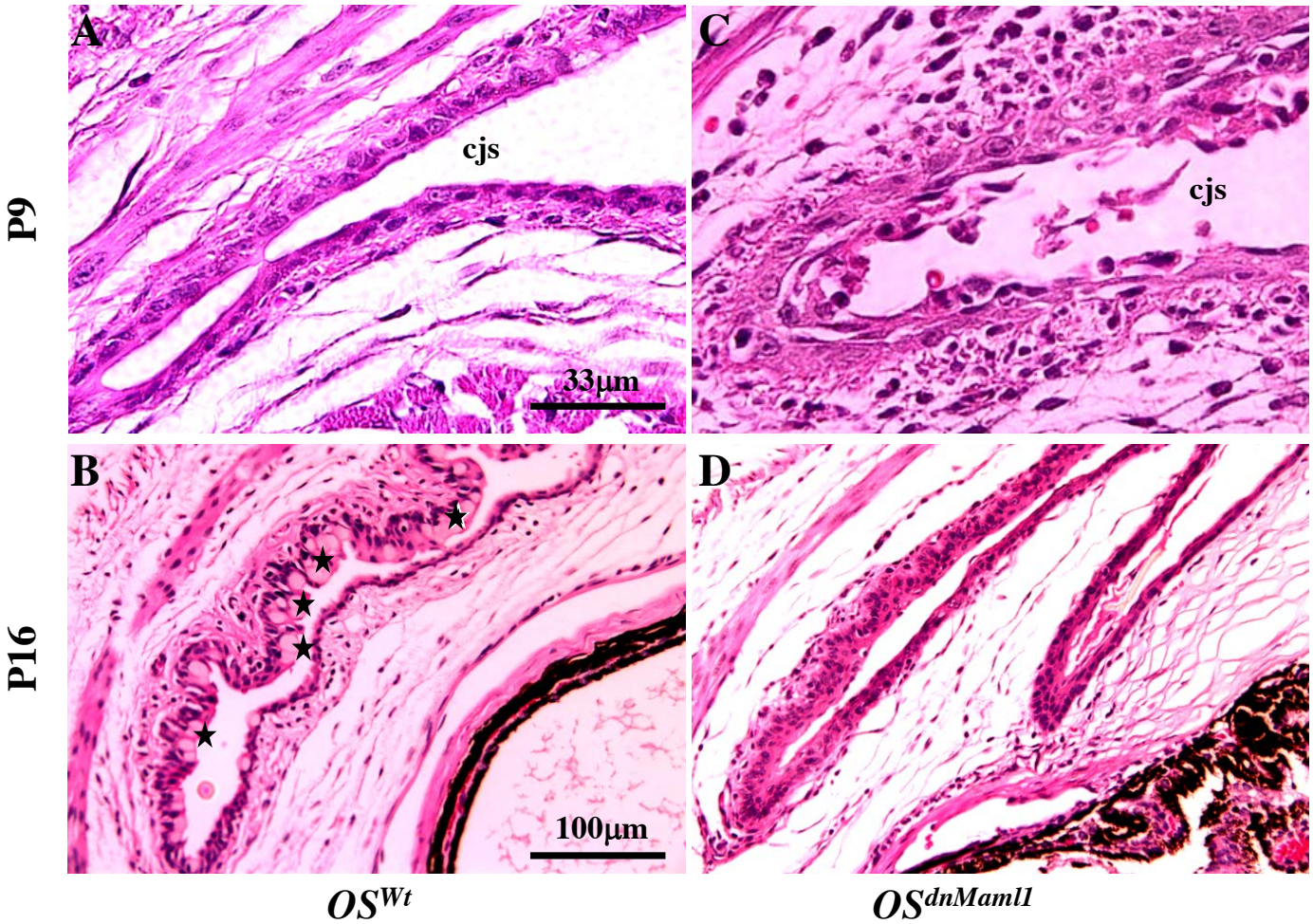

Fig. S1. Expression of dnMaml1 resulted in hyperplastic transformation in conjunctival epithelium. (**A-D**) Hematoxylin and Eosin staining of the forniceal conjunctiva. Unlike OS^{Wt} in bulbar conjunctiva, in which two layers of epithelial cells appeared at P9 (A) and subsequent goblet cell differentiation (asterisks in B) occurred at P16, dnMaml1 expression resulted in hyperplasia but failed to form goblet cells at P16 (D). Abbreviation: cjs, conjunctival sac

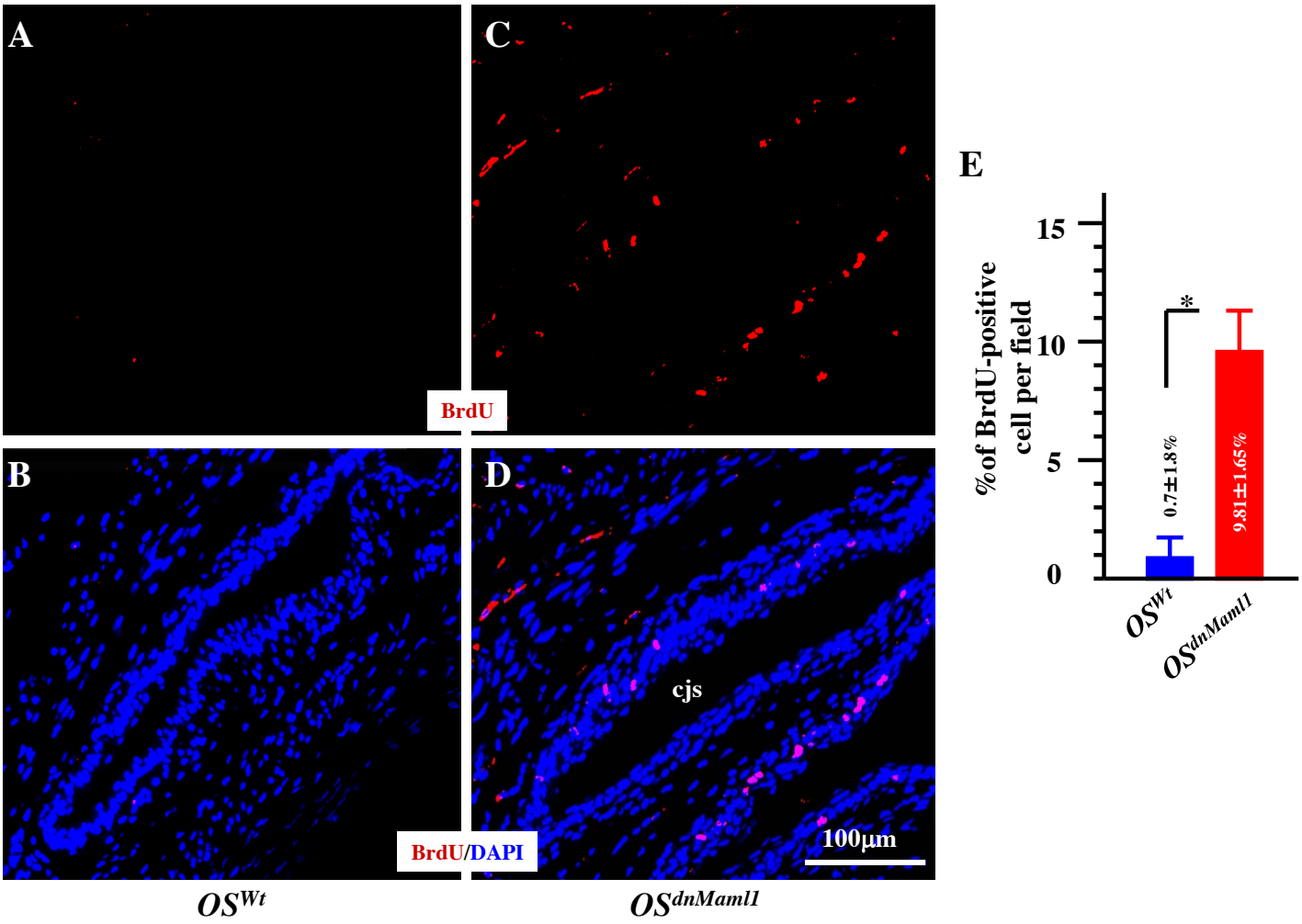

Fig. S2. Expression of dnMaml1 enhanced cell proliferation. (**A-E**) Immunoflurescent staining (A-D) and quantitative histogram (E) revealed that $OS^{dnMAML1}$ (C,D) increased BrdU uptake by 14-fold when compared with an OS^{Wt} littermate control (A,B). Abbreviation: cjs, conjunctival sac. *P<0.05.

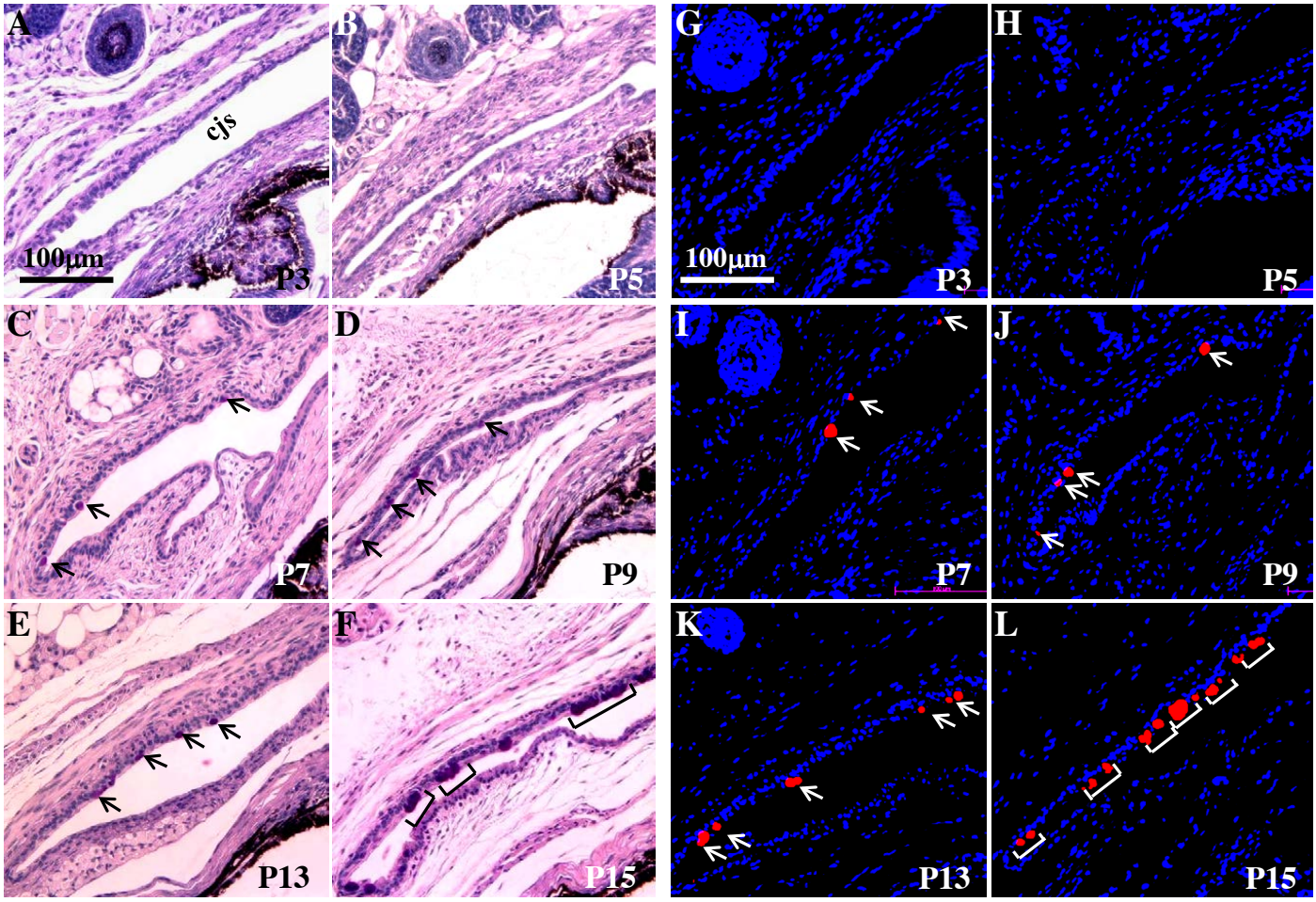

Fig. S3. Time course of goblet cell differentiation during neonatal ages in normal mouse. (**A-L**) PAS staining (A-F) and immunofluorescent staining of Muc5ac (G-L). Goblet cells started to emerge in bulbar conjunctival epithelium at P7 and formed clusters at P15. Abbreviation: cjs, conjunctival sac.

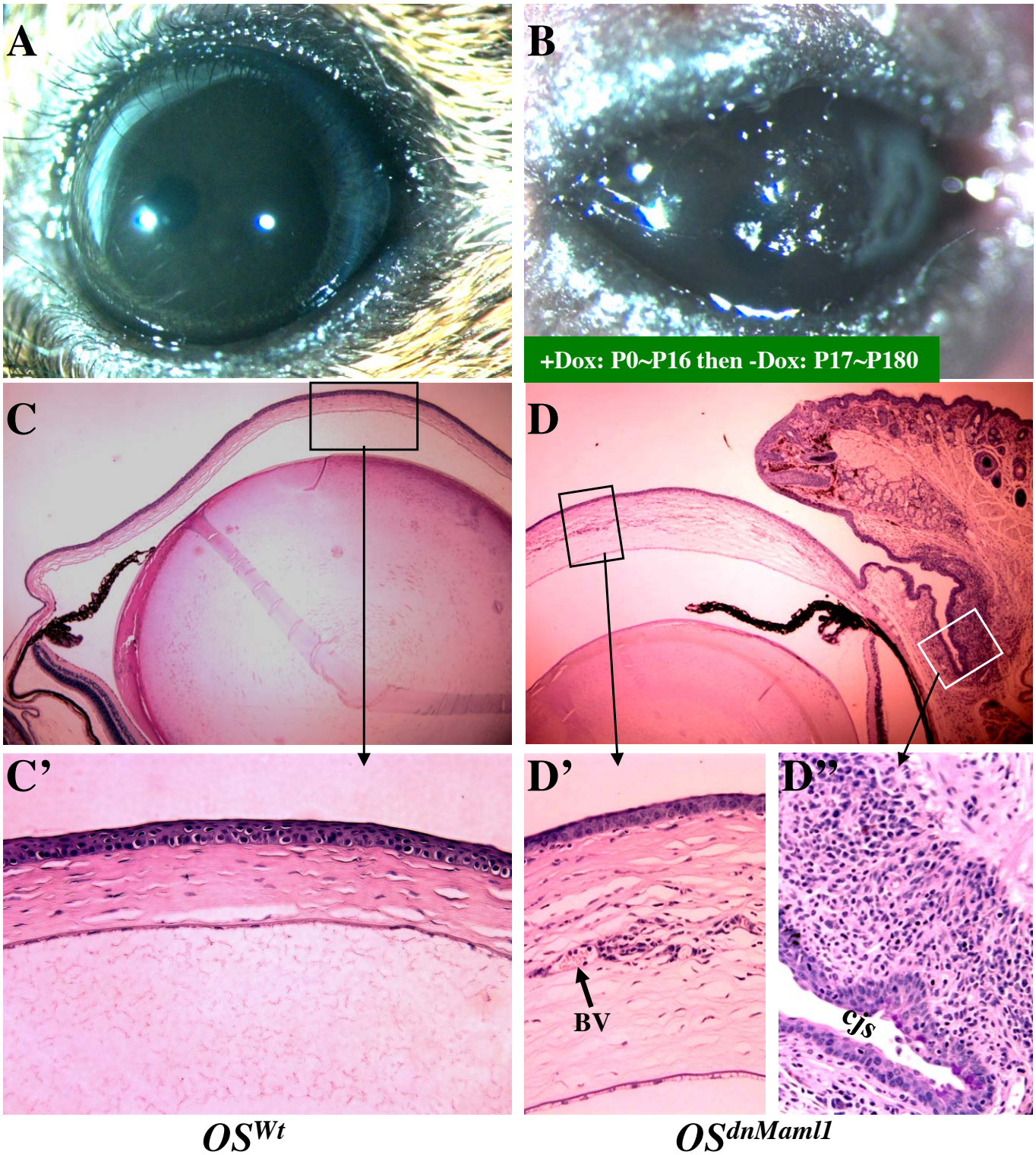

Fig. S4. Expression of dnMaml1 led to irreversible loss of goblet cells. (**A-D″**) *K14-rtTA/TC/Rosa*^{dnMaml1} mouse (B) and *TC/Rosa*^{dnMaml1} littermate (A) were fed with Dox from P0 to P16 and then changed to regular chow, withour Dox, from P17 to P180. Severe ocular surface ulceration was observed in OS^{dnMaml1} (compare B with A). (C-D″) Histological examinations demonstrated OS^{dnMaml1} led to persistent conjunctival squamous hyperplasia and corneal edema, inflammation and neovascularization (D′,D″ are from the insets in D). Abbreviations: bv, blood vessel; cjs, conjunctival sac.

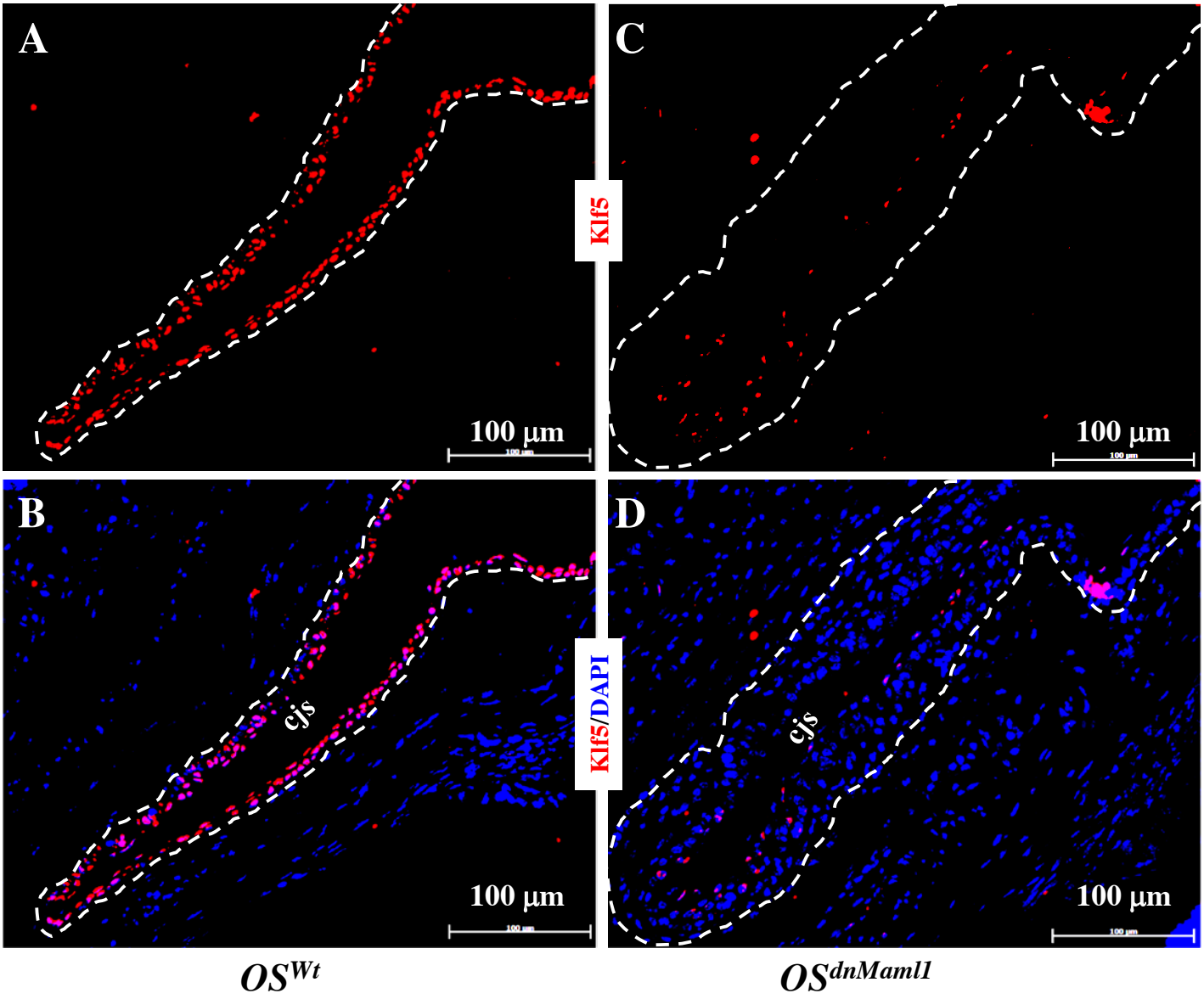

Fig. S5. OS^{dnMaml1} downregulated Klf5. (**A-D**) Immunofluorescent staining showed that nuclear Klf5 expression decreased dramatically in OS^{dnMaml1} (C,D) when compared with the OS^{Wt} (A,B) littermate at P9. Abbreviation: cjs, conjunctival sac.

Table S1. List of antibodies used in this study

Primary antibody	Host	Source	Application
Anti-RBP-Jκ	Rabbit	Ab25949, Abcam	ChIP (1:200)
Anti-Klf4	Goat	AF3640, R&D System	ChIP (1:200)
Anti-Klf4	Goat	AF3640, R&D System	IHC (1:1000)
Anti-GFP	Rabbit	Ab290, Abcam	IHC (1:200)
Anti-K10	Rabbit	PRB159P, Covance	IHC (1:100)
Anti-K12	Rabbit	Custom made (Liu et al, 1994)	IHC (2 μg/ml)
Anti-K13	Rabbit	Ab58744, Abcam	IHC (1:100)
Anti-K14	Rabbit	PRB155-P, Covance	IHC (1:1000)
Anti-K15 (LHK15)	Mouse	MS-1068, Thermo Scientific.	IHC (1:100)
Anti-Pax-6	Rabbit	PRB-278P-100, Covance	IHC (1:300)
Anti-mucin5A/C (45M1)	Mouse	Ab3649, Abcam	IHC (1:500)
Anti-p63 (4A4)	Mouse	Sc8431, Santa Cruz	IHC (1:100)
Anti-PCNA (PC10)	Mouse	Ab29, Abcam	IHC (1:500)
Anti-BrdU (BRD.3)	Mouse	MS-1058-P, Fisher Scientific	IHC (1:100)
Anti-CD45 (F10-89-4)	Mouse	05-1410, Millipore	IHC (1:100)
Secondary antibody			
Anti-rabbit IgG Alexa488	Goat	Invitrogen	IHC (1:500)
Anti-rabbit IgG Alexa555	Goat	Invitrogen	IHC (1:500)
Anti-mouse IgG Alexa555	Rabbit	Invitrogen	IHC (1:500)
Anti-goat IgG Alexa555	Donkey	Invitrogen	IHC (1:500)

IHC, immunohistochemistry; ChIP, chromosome immunoprecipitation

Table S2. Primer information for the PCR

Primer name	Primer sequence	size (bp)	Application
mMamL-1	Forward 5' GCACAGCGCGGTCATGGAGC	166	RT-qPCR
	Reverse 5' GCGCTTGGCCTTGGCCTGGA		
mHey-1	Forward 5’ GCTGAGATCTTGCAGATGAC	133	RT-qPCR
	Reverse 5’ CAACTTCGGCCAGGCATTCC		
mHes-1	Forward 5’ GTCAACACGACACCGGACAA	81	RT-qPCR
	Reverse 5’ CCTTCGCCTCTTCTCCATGA		
mKlf4	Forward 5’ TCAAGGCACACCTGCGAACT	108	RT-qPCR
	Reverse 5’ TGCGGTAGTGCCTGGTCAGT		
mGapdh	Forward 5’ AAGGTGGTGAAGCAGGCATCT	232	RT-qPCR
	Reverse 5’ TCTTACTCCTTGGAGGCCATGT		
KLF4-hMuc5A/Cpr	Forward 5’ GAGAGTCTAGGGTGGGGTATGT	203	ChIP assay
KLF4-hMuc5A/Cpr	Reverse 5’ CAGCCCCGTGCTTCACGTGGGT		
Rbpj-mKLF4pr	Forward 5’ CTCAATCCTAGCTTTCCAAGCC	150	ChIP assay
Rbpj-mKLF4pr	Reverse 5’ ATTCCCTTGGAACTAGGCCAGT		