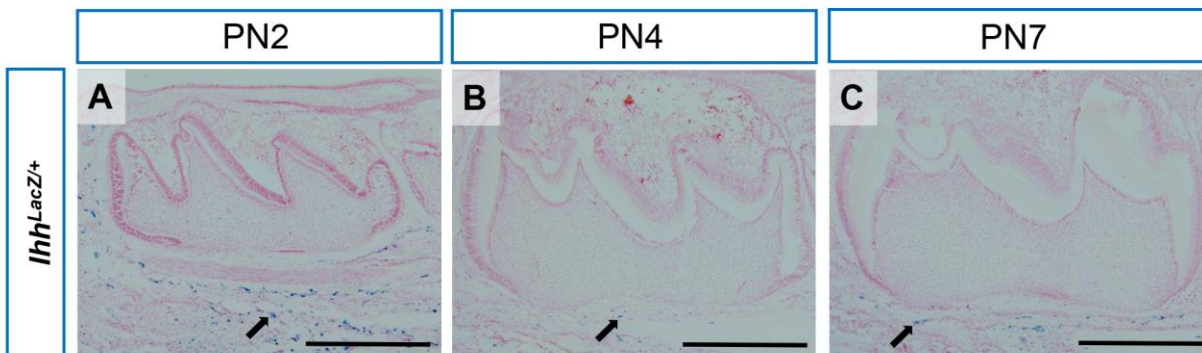
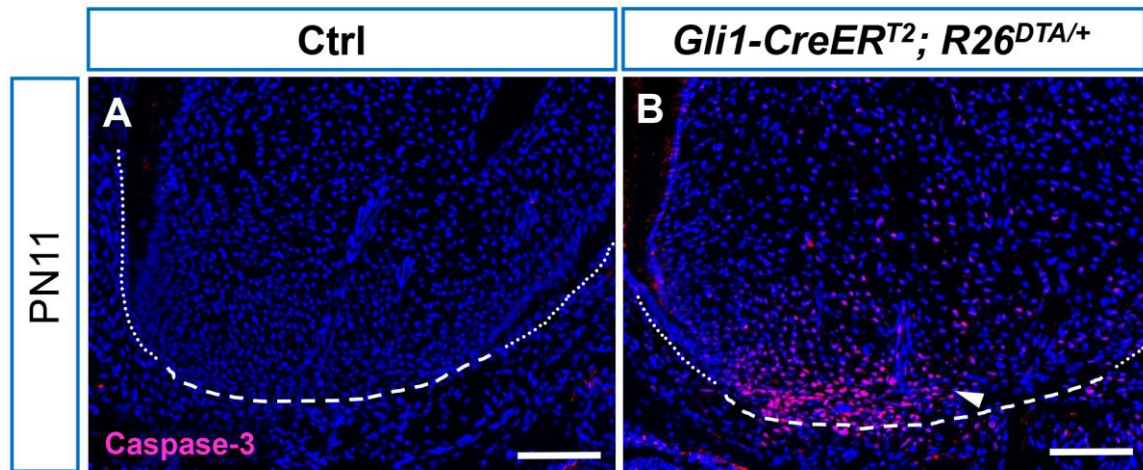


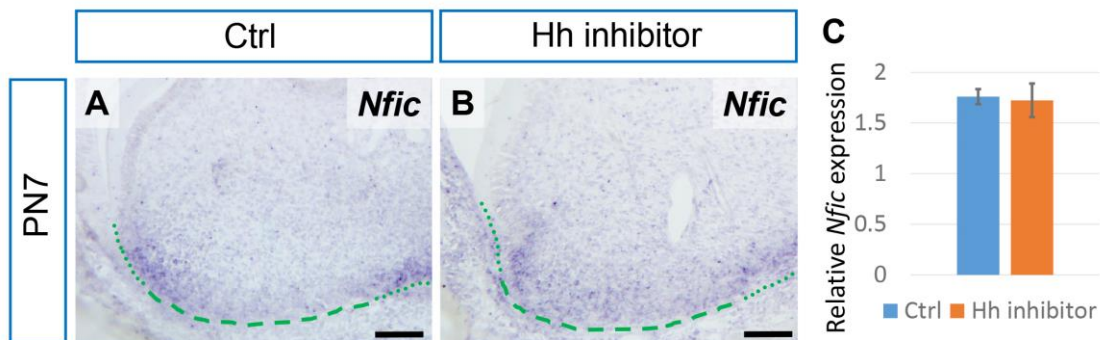
**Fig. S1. Postnatal developmental stages of the first mandibular molar. (A-F)** HE staining of first mandibular molars from control mice at the indicated ages, PN0 to PN18. White arrows indicate root dentin, white arrowheads indicate periodontal ligament. HERS, Hertwig's Epithelial Root Sheath; AP, apical papilla; B, alveolar bone. Scale bars: 500 μm.



**Fig. S2. *Ihh* is undetectable in developing molars. (A-C)** X-gal staining of *Ihh<sup>lacZ/+</sup>* mice at PN2, PN4 and PN7. Arrows indicate positive signal in the bone. Scale bars: 500 μm.



**Fig. S3. Elevated apoptosis in developing molars of *Gli1-CreERT2;R26<sup>DTA/+</sup>* mice.** (A-B) Immunostaining of active- and pro-caspase-3 (red) in the mesial apical papilla of first mandibular molars from PN11 control (Ctrl) and *Gli1-CreERT2;R26<sup>DTA/+</sup>* mice after tamoxifen injection at PN3. White arrowhead indicates positive signal. Dotted lines indicate the HERS, dashed lines indicate the border of the apical papilla. Scale bars: 100 μm.



**Fig. S4. *Nfic* expression is not significantly changed after inhibition of Hedgehog signaling.** (A-B) *in situ* hybridization of *Nfic* in the first mandibular molars of PN7 control mice untreated (Ctrl) or treated with Hh inhibitor. Dotted lines indicate the HERS, dashed lines indicate the border of the apical papilla. (C) Quantitative RT-PCR of *Nfic* from the apical tissue of first mandibular molars of PN7 control mice untreated (Ctrl) or treated with Hh inhibitor. n=3 per group. Scale bars: 100 μm.

**Table S1. Animal information**

Mouse line	Full name	Source	Reference
<i>Shh-CreER<sup>T2</sup></i>	B6.129S6- <i>Shh<sup>tm2(cre/ERT2)Cjt/J</sup></i>	JAX #005623	(Harfe et al., 2004)
<i>R26<sup>tdTomato/+</sup></i>	B6;129S6- <i>Gt(ROSA)26Sor<sup>tm9(CAG-tdTomato)Hze/J</sup></i>	JAX #007905	(Madisen et al., 2010)
<i>Gli1<sup>lacZ/+</sup></i>	<i>Gli1<sup>tm2Alj/J</sup></i>	JAX #008211	(Bai et al., 2002)
<i>Gli1-CreER<sup>T2</sup></i>	<i>Gli1<sup>tm3(cre/ERT2)Alj/J</sup></i>	JAX #007913	(Ahn and Joyner, 2004)
<i>R26<sup>DTA/+</sup></i>	<i>Gt(ROSA)26Sor<sup>tm1(DTA)Jpmb/J</sup></i>	JAX #006331	(Ivanova et al., 2005)
<i>R26SmoM2<sup>fl/fl</sup></i>	<i>Gt(ROSA)26Sor<sup>tm1(Smo/EYFP)Amc/J</sup></i>	JAX #005130	(Jeong et al., 2004)
<i>Nfic<sup>-/-</sup></i>	<i>Nfic<sup>-/-</sup></i>	Gift from Dr. Richard Gronostajski	(Steele-Perkins et al., 2003)
<i>Ihh<sup>lacZ/+</sup></i>	<i>Ihh-nLacZ</i>	Gift from Dr. Andrew McMahon	(Fabian et al., 2012)

**Table S2.**

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