Supporting Information

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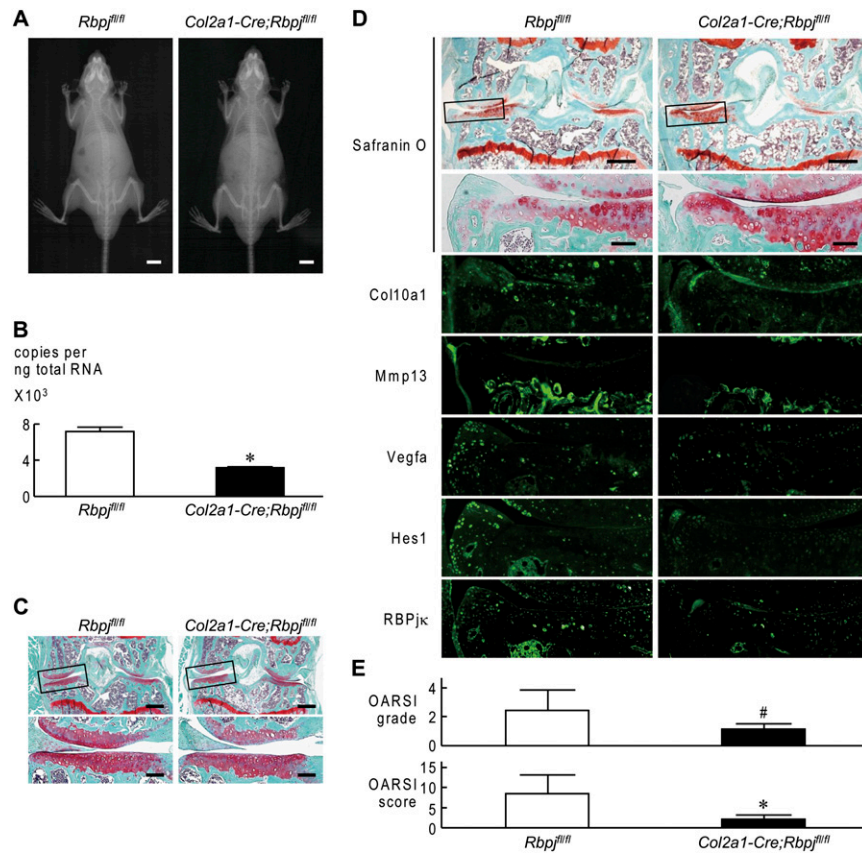

Fig. S1. Osteoarthritis (OA) development in a type II collagen (*Col2a1*)-Cre;*Rbpj*$^{fl/fl}$ mouse line, which survived after birth. (*A*) Plain radiographs of *Rbpj*$^{fl/fl}$ and *Col2a1-Cre;Rbpj*$^{fl/fl}$ littermates (8 wk old). (Scale bars, 10 mm.) (*B*) mRNA levels of *Rbpj* in articular chondrocytes from *Rbpj*$^{fl/fl}$ and *Col2a1-Cre;Rbpj*$^{fl/fl}$ littermates (6 d old). Data are expressed as means ± SD *$P < 0.01$ versus *Rbpj*$^{fl/fl}$. (*C*) Safranin O staining of mouse knee joints in 8-wk-old *Rbpj*$^{fl/fl}$ and *Col2a1-Cre;Rbpj*$^{fl/fl}$ littermates under physiological conditions. *Insets* in the *Upper* safranin O-stained images indicate the regions shown in the enlarged images (*Lower*). (Scale bars, 400 μm and 100 μm for low and high magnification images, respectively.) (*D*) Cartilage degradation assessed by safranin O staining and immunofluorescence with antibodies to Col10a1, Mmp13, Vegfa, Hes1, and RBPjκ in mouse knee joints 8 wk after creating a surgical OA model in 8-wk-old *Rbpj*$^{fl/fl}$ and *Col2a1-Cre;Rbpj*$^{fl/fl}$ littermates. Insets in the *Upper* safranin O-stained image indicate the regions shown in the enlarged safranin O-stained or immunofluorescence images (*Lower*). (Scale bars, 400 μm and 100 μm for low and high magnification images, respectively.) (*E*) Quantification of OA development by Osteoarthritis Research Society International (OARSI) grading systems. Data are expressed as means ± SD of seven mice per group. #$P < 0.05$, *$P < 0.01$ versus *Rbpj*$^{fl/fl}$.

Fig. S2. In vitro and in vivo expression patterns of the canonical and noncanonical Notch ligands during chondrocyte differentiation and OA development. (*A*) mRNA levels of the canonical membrane ligands: Delta-like (Dll) 1, 3, 4, and Jagged (Jag) 1, 2, in mouse primary costal chondrocytes and articular chondrocytes cultured for 5 and 7 d, respectively. (*B*) Safranin O staining and expressions of the canonical ligands by immunofluorescence in mouse knee joints before (0) and 1, 4, and 8 wk after creating a surgical OA model in 8-wk-old mice. (Scale bars, 100 μm.) (*C*) mRNA levels of the noncanonical ligands: Ccn3, Magp1, and Magp2, in mouse primary costal chondrocytes and articular chondrocytes cultured for 5 and 7 d, respectively. (*D*) Safranin O staining and expressions of the noncanonical ligands by immunofluorescence in mouse knee joints before (0) and 1, 4, and 8 wk after creating a surgical OA model in 8-wk-old mice. (Scale bars, 100 μm.)

Table S1. Histomorphometric analyses of subchondral bones in knee joints of *Rbpj*$^{fl/fl}$ and *Col2a1-Cre*^{ERT};*Rbpj*$^{fl/fl}$ littermates (8 wk old)

	Rbpj$^{fl/fl}$	*Col2a1-Cre*^{ERT};*Rbpj*$^{fl/fl}$
BV/TV, %	17.95 ± 3.27	17.73 ± 3.98
Tb.Th, μm	29.05 ± 1.39	28.01 ± 4.05
Tb.N, mm	6.15 ± 0.81	6.28 ± 0.51
Tb.Sp, μm	164.36 ± 20.29	159.91 ± 12.99

Data are expressed as means ± SD of three mice per group. BV/TV, bone volume/tissue volume; Tb.N, trabecular number; Tb.Sp, trabecular spacing; Tb.Th, trabecular thickness. None of the parameters show significant difference between the two genotypes ($P > 0.05$).