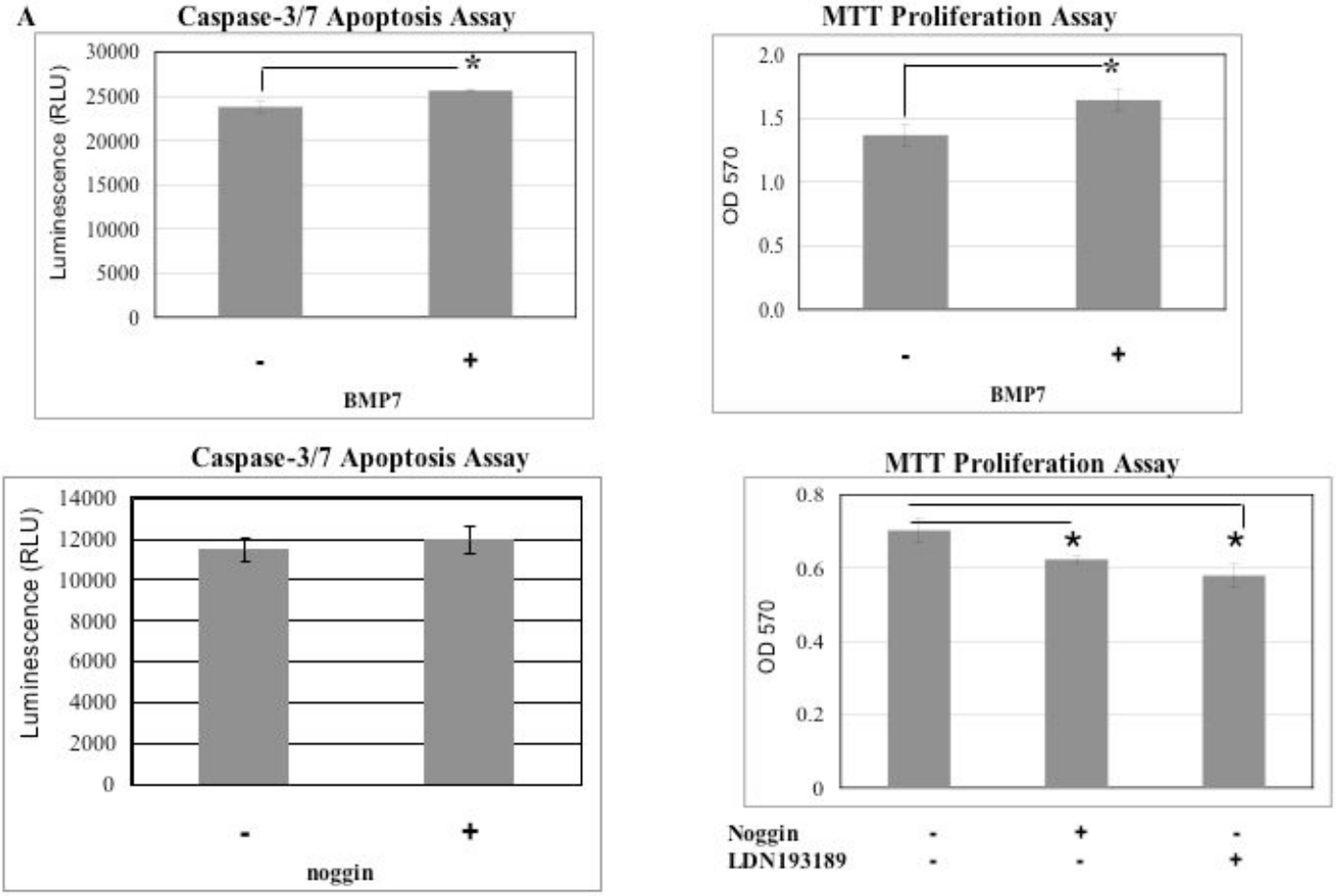
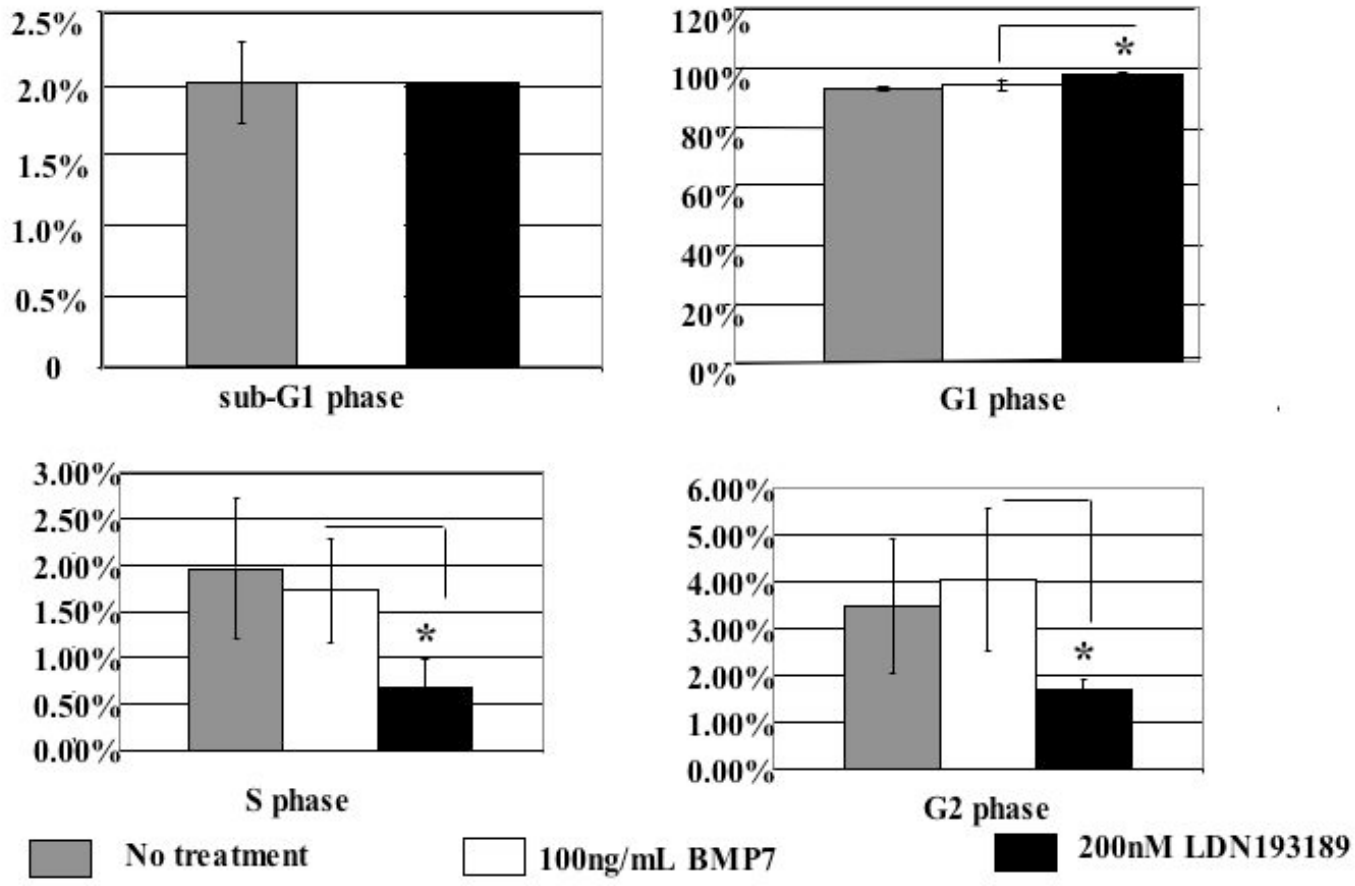
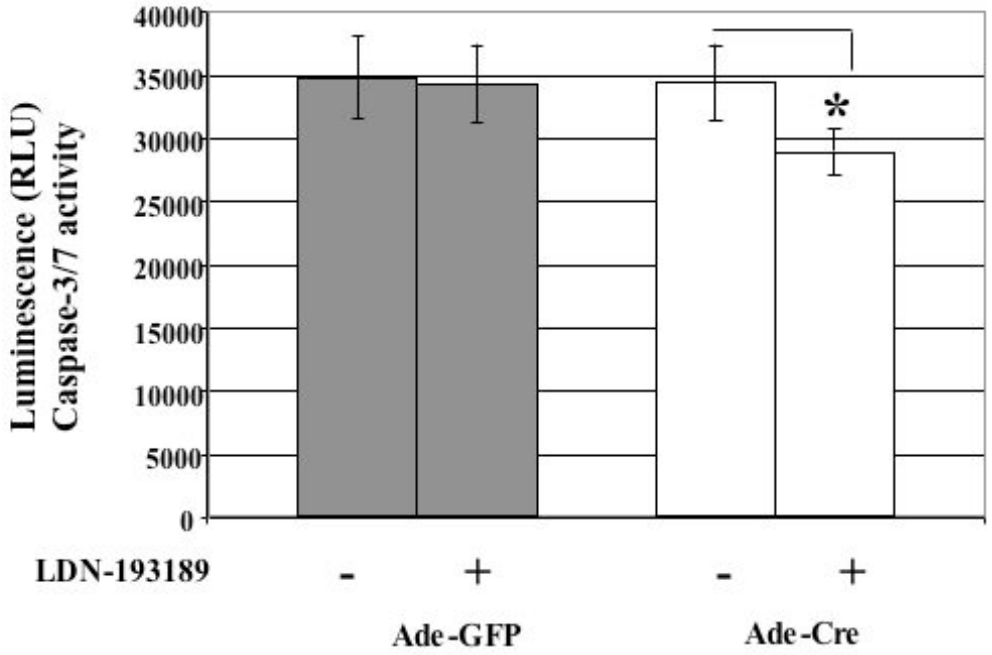


Supplemental Figure 1. The effect of altered BMP signaling on wild-type primary chondrocyte proliferation and apoptosis. Postnatal day 3 primary rib chondrocytes from wild-type mice were cultured for 2 days and then treated for 48 hours with 100ng/ml BMP7 (A), 0.5μg/ml Noggin or 200nM LDN193189 (B). Cell proliferation was measured by MTT assay (left panel), and etoposide-stimulated caspase-3/7 activity of apoptosis was measured by Caspase-Glo3/7 assay (right panel).
* $p<0.05$ between treated vs untreated groups. N=4 per group.



Supplemental Figure 2. Significant difference in cell cycle progression between BMP7-treated and LDN193189-treated chondrocytes. Postnatal day 3 primary rib chondrocytes from wild-type mice were cultured for 2 days and then treated for 48 hours with 100ng/ml BMP7 (A) or 200nM LDN193189 (B). Afterwards, propidium iodide-based cell cycle analysis was performed with a flow cytometer.
* $p<0.05$ between BMP7-treated groups (empty box) vs LDN193189-treated groups (black box) N=5 per group.



Supplemental Figure 3. The BMP inhibitor LDN193189 reduced caspase-3/7-mediated apoptosis in *Jab1*-knockdown chondrocytes. Primary rib chondrocytes of postnatal day 3 *Jab1*$^{flox/flox}$ mice were infected with adenovirus expressing Cre (Ade-Cre) or green fluorescent protein (Ade-GFP). Cells were cultured for 5 days, followed by 48-hour treatment of 200nM LDN193189. Afterwards, etoposide-stimulated caspase-3/7 activity of apoptosis was measured by Caspase-Glo3/7 assay (right panel). LDN193189 significantly decreased caspase-3/7 activity in primary chondrocytes infected with Ade-Cre, but had no effect on primary chondrocytes infected with control Ade-GFP. * $p<0.05$ N=5 per group.

Table S1. Primers used in real time RT-PCR analyses

Gene	Primers*	Size (bp)	Accession No.
Gdf10	GAAGTACAACCGAAGAGGTGC AGGCTTTTGGTCGATCATTTCC	88	NM_145741
Id1	AAAGCGTGGCCATCTCGCGC GGCACTGATCTCGCCGTTCAGG	293	NM_010495
Ihh	TTCAAGGACGAGGAGAACACG ATTTCGGTCACGGTCTGAGG	213	NM_010544
Jab1	TTGCATCTTGATTGTGGAGCGAC CAGTATTTAAAGTAGTGGTGATCC	208	NM_013715
Smad7	GGCCGGATCTCAGGCATTC TTGGGTATCTGGAGTAAGGAGG	153	NM_001042660
Snail2	CAGCGAACTGGACACACACA ATAGGGCTGTATGCTCCCGAG	111	NM_011415
Gapdh	ATGGGAAGCTTGTCATCAAC GTGGTTCACACCCATCACAA	221	NM_008084

*All primer sequences are presented from 5' to 3'. For each gene, the top sequence is the sense primer, and the bottom sequence is the anti-sense primer.

Table S2. Primary antibodies for Immunohistochemistry (IHC) and Western blotting (WB) in this study

Name	Type	Company	Dilution/Applications
Jab1	Rabbit polyclonal IgG	Santa Cruz	1:100 (IHC); 1:200 (WB)
γ-tubulin	Mouse monoclonal IgG1	Sigma-Aldrich	1:100 (WB)
Phospho-Smad1/5	Rabbit monoclonal IgG	Cell Signaling	1:50 (IHC); 1:100 (WB)
Phospho-Smad2/3	Rabbit monoclonal IgG	Cell Signaling	1:100 (WB)
Total Smad1/5	Mouse monoclonal IgG	Santa Cruz	1:500 (WB)
Runx2	Goat polyclonal IgG	Santa Cruz	1:200 (IHC)
Runx2	mouse monoclonal IgG	MBL	1:200 (WB)
Skp1	Rabbit monoclonal IgG	Epitomics	1:100 (WB)
$p27^{Kip1}$	Rabbit polyclonal IgG	Cell Signaling	1:100 (WB)
Csn3	Rabbit monoclonal IgG	Epitomics	1:100 (WB)
IκB-α	Rabbit monoclonal IgG	Epitomics	1:100 (WB)
Gdf10	Rabbit monoclonal IgG	Epitomics	1:100 (WB)
Xpress	mouse monoclonal IgG	Invitrogen	1:500 (WB)
Flag	mouse monoclonal IgG	Sigma	1:500 (WB)