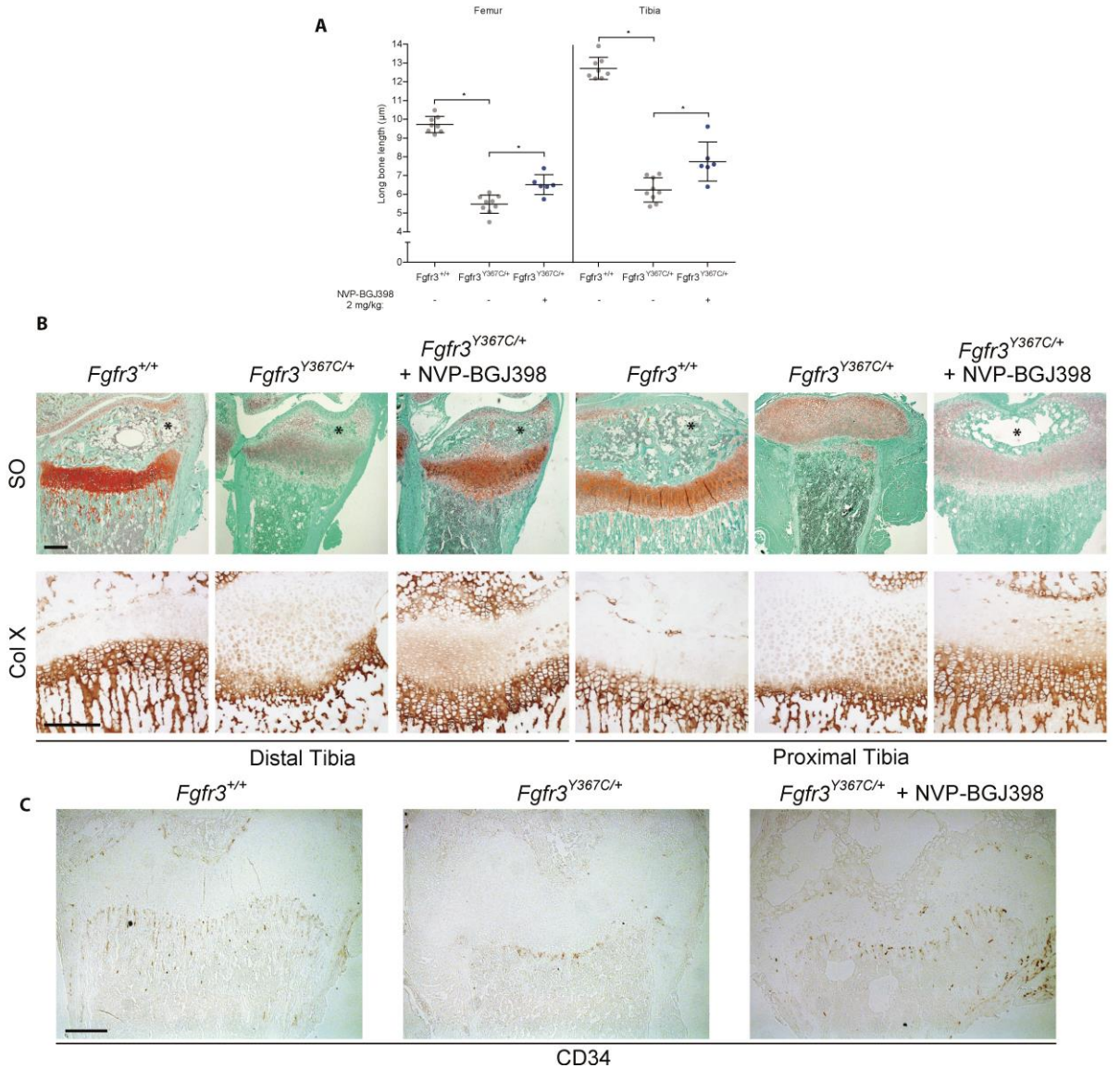
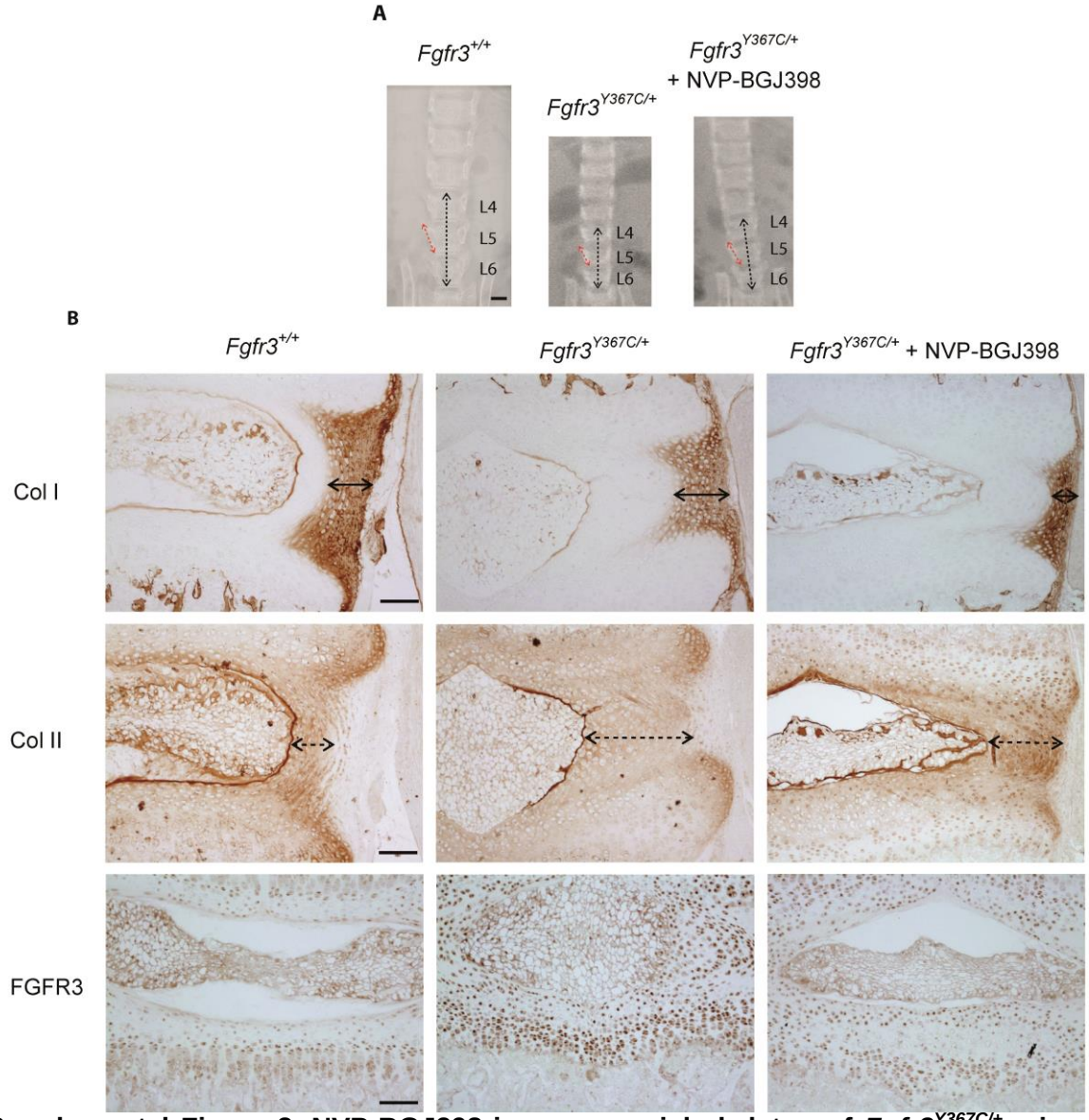
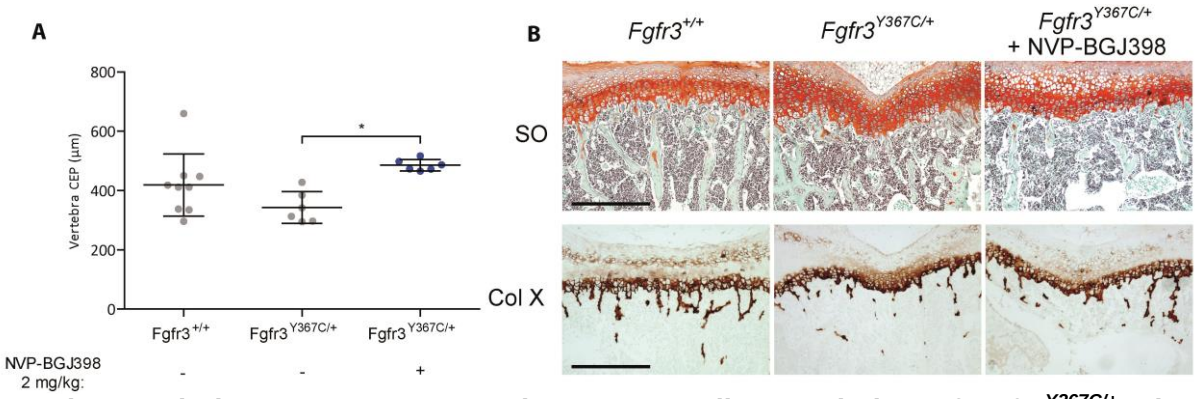


Supplemental Figure 1. NVP-BGJ398 daily injections rescue long bone defect of *Fgfr3*$^{Y367C/+}$ mice. (**A**) Femur and tibia bone length measured with µCT images (*Fgfr3*$^{+/+}$ n = 8, untreated *Fgfr3*$^{Y367C/+}$ n = 9, treated *Fgfr3*$^{Y367C/+}$ n = 6, *P < 0.05 by One-way ANOVA test). Data are expressed as mean ± s.d. (**B**) Safranin-O staining and immunohistochemistry for Col X on histological section of tibia (scale bar = 200 µm). Asterisks show secondary ossification centers. Images shown are representative of n = 5 animals per group. (**C**) Immunohistochemistry for CD34 on histological section of distal tibia (scale bar = 200 µm).

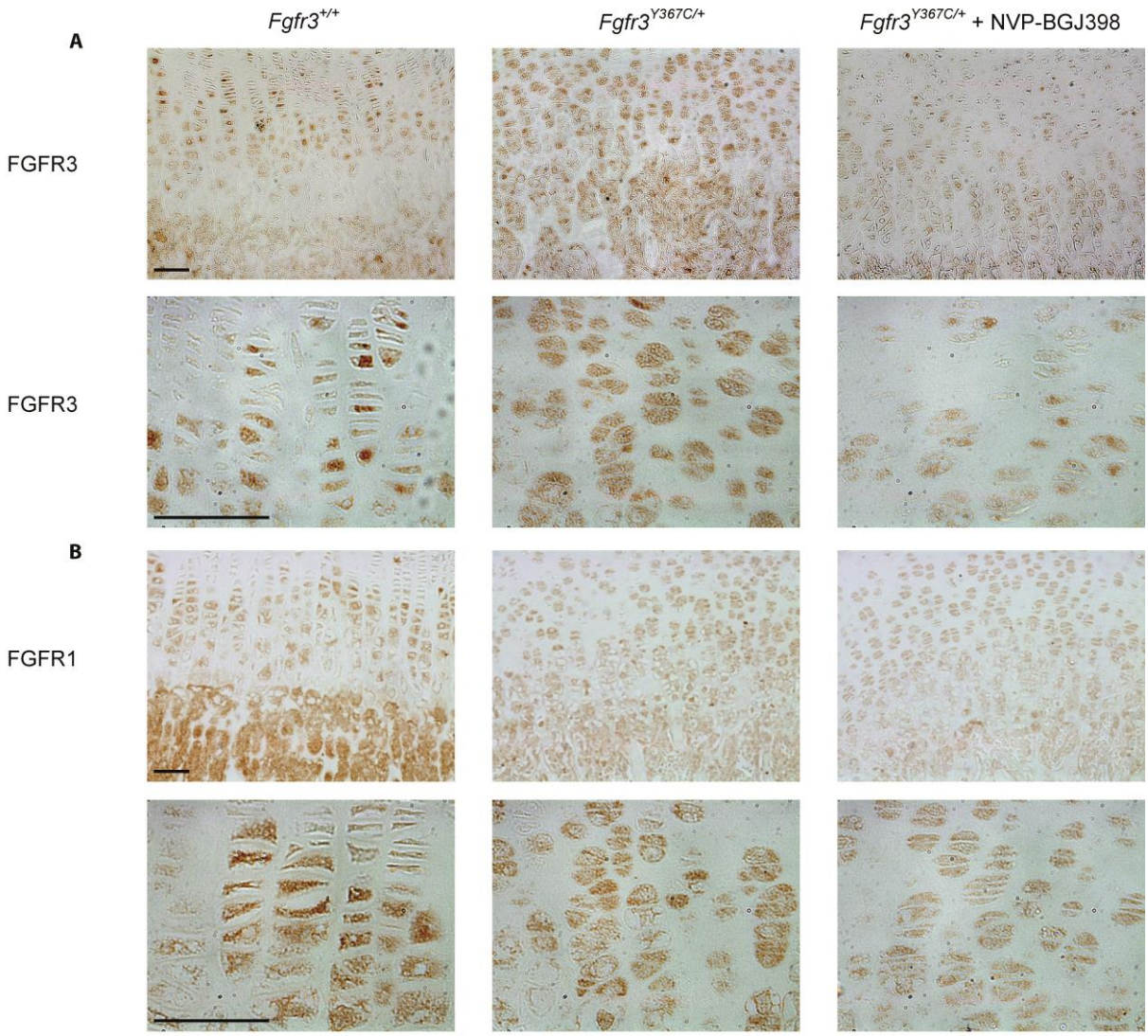
Images shown are representative of n = 5 animals per group. All data concern animals treated with protocol 1 (16 days old).



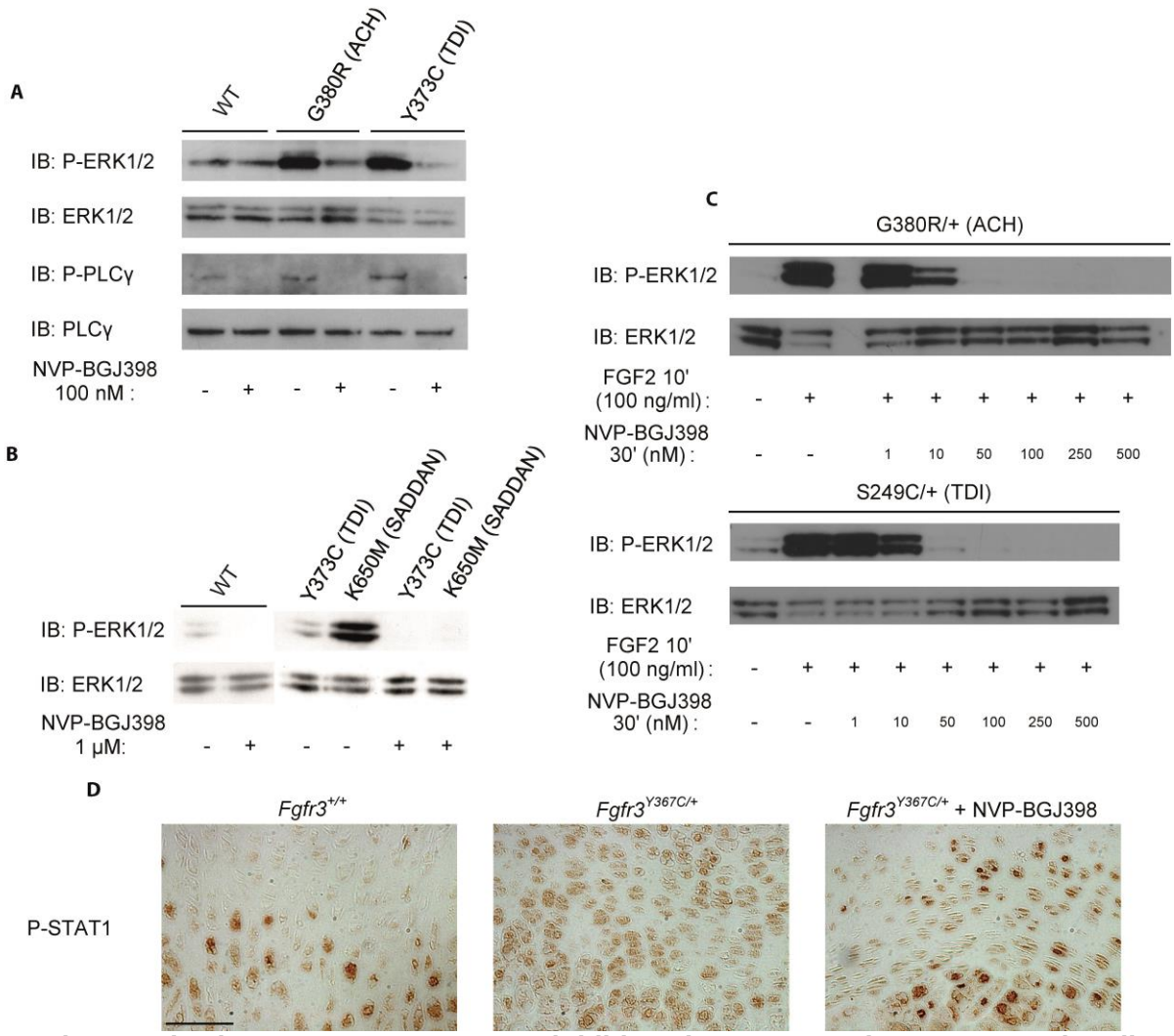
Supplemental Figure 2. NVP-BGJ398 improves axial skeleton of *Fgfr3*$^{Y367C/+}$ mice. (**A**) X-rays of lumbar vertebrae (L4-L6), the black arrows show the L4-L6 segment and red arrow show L5 pedicle landmarks (scale bar = 2 mm). (**B**) Immunohistochemistry for FGFR3, Col I and Col II on lumbar IVD outlying IAF (dashed arrows) and OAF (full arrows) (scale bar = 100 µm). Images shown are representative of n = 6 animals per group. All data concern animals treated with protocol 1 (16 days old).



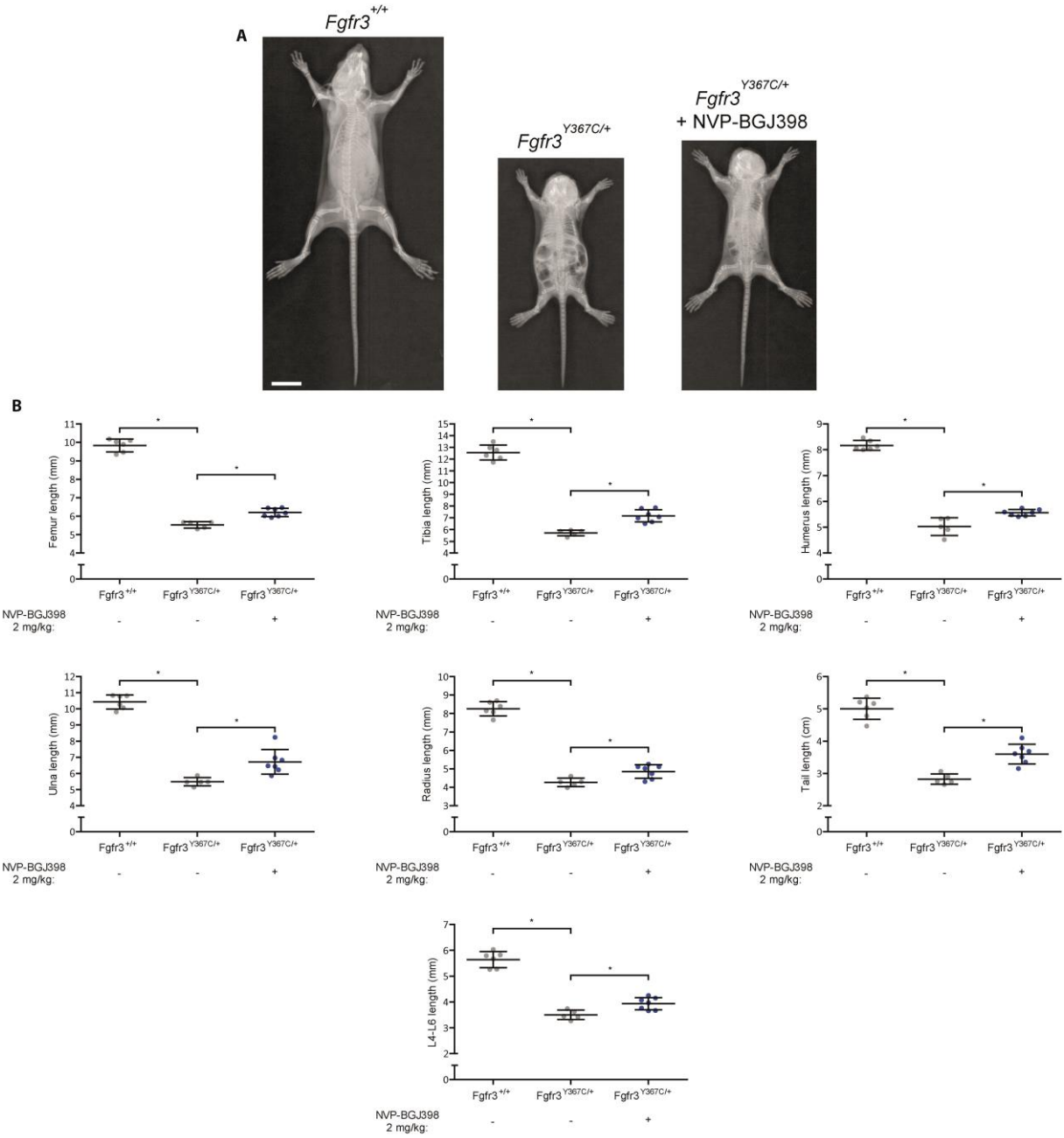
Supplemental Figure 3. NVP-BGJ398 improves cartilage end plate of *Fgfr3*$^{Y367C/+}$ mice. (**A**) Vertebra Cartilage End Plate (CEP) length (*Fgfr3*$^{+/+}$ n = 9, untreated *Fgfr3*$^{Y367C/+}$ n = 6, treated *Fgfr3*$^{Y367C/+}$ n = 6, *P < 0.05 by One-way ANOVA test). (**B**) Safranin-O staining and immunohistochemistry for Col X on histological section of CEP (scale bar = 200 µm). Images shown are representative of n = 6 animals per group. All data concern animals treated with protocol 1 (16 days old). Data are expressed as mean ± s.d.



Supplemental Figure 4. FGFR3 and FGFR1 expression in femoral growth plate. (A) Immunohistological analyses of FGFR3 show that the FGFR3 expression is increased in *Fgfr3*$^{Y367C/+}$ mice and decreased after NVP-BGJ398 treatment. **(B)** The expression of FGFR1 revealed by immunohistochemistry is not modified in all conditions. All data concern animals treated with protocol 1 (16 days old) (scale bar = 50 µm). All images shown are representative of n = 6 animals per group. All data concern animals treated with protocol 1 (16 days old).



Supplemental Figure 5. NVP-BGJ398 inhibits the FGFR3 downstream signaling pathways. (**A**) Phosphorylated ERK1/2 and PLCγ expression in transfected human chondrocytes with $FGFR3^{WT}$, $FGFR3^{G380R}$ (ACH), $FGFR3^{Y373C}$ (TDI) constructs are reduced with NVP-BGJ398. (**B**) Phosphorylated ERK1/2 expression in transfected HEK293-Vnr cells with $FGFR3^{WT}$, $FGFR3^{Y373C}$ (TDI), $FGFR3^{K650M}$ (SADDAN) constructs are reduced with NVP-BGJ398. (**C**) Dose response effect of NVP-BGJ398 on phosphorylated ERK1/2 in immortalized ACH (G380R/+) and TDI (S249C/+) human chondrocytes. (IP = Immunoprecipitation, IB = Immunoblotting). (**D**) Immunohistological analyses of phosphorylated STAT1 show an increase expression in *Fgfr3*$^{Y367C/+}$ mice and decreased expression after NVP-BGJ398 treatment. Images shown are representative of n = 4 animals per group (scale bar = 50 µm). All data concern animals treated with protocol 1 (16 days old). Western blots are representative of 3 independent experiments.



Supplemental Figure 6. NVP-BGJ398 improves growth of the axial and appendicular skeleton in *Fgfr3*$^{Y367C/+}$ mice (protocol 2)

(**A**) Radiographs of *Fgfr3*$^{+/+}$, treated and untreated *Fgfr3*$^{Y367C/+}$ skeletons show the benefit effect of the treatment (scale bar = 1 cm). (**B**) NVP-BGJ398 improvement of the lengths of femur, tibia, humerus, ulna, tail, radius and L4-L6 (*Fgfr3*$^{+/+}$ n = 6, untreated *Fgfr3*$^{Y367C/+}$ n = 5, treated *Fgfr3*$^{Y367C/+}$ n = 7, *P < 0.05 by One-way ANOVA test). Data are expressed as mean ± s.d.