SUPPLEMENTAL FIGURE LEGENDS

Figure 1. PD98059 rescues tibial fracture repair in *PeriCre; Nf1$^{flox/-}$* mice *in vivo*. Tibial fractures were generated for *PeriCre;Nf1$^{flox/-}$* mice. Osmotic pumps containing vehicle control (PBS; n=7) or PD98059 (n=19) were implanted subcutaneously in the contralateral dorsal flank and X-ray scans were performed weekly. **(A)** Representative radiographs were taken at 0, 14, 21, 28 days post-fracture, which demonstrate improved fracture-healing in the PD98059 treated mice. **(B)** The percentage of healed fractures, defined radiographically by complete periosteal bridging across the fracture site, was compared between *PeriCre;Nf1$^{flox/-}$* mice receiving vehicle versus PD98059 treatment. **(C)** Representative photomicrographs (20X) of MacNeal's/Von Kossa counter stain and TRACP stain are shown. MacNeal's/von Kossa counter staining shows enhanced bone mineralization in mice receiving PD98059 treatment versus vehicle. Significant reduction in TRACP positive osteoclasts is observed in PD98059 treated mice compared to vehicle treatment.

Figure 2. Reduced neurofibromin expression in NF1 hMSCs. Neurofibromin expression was determined by western blot in control hMSCs (n=2) and NF1 hMSCs (n=3). The relative neurofibromin expression level was quantified by densitometry using Image J software.