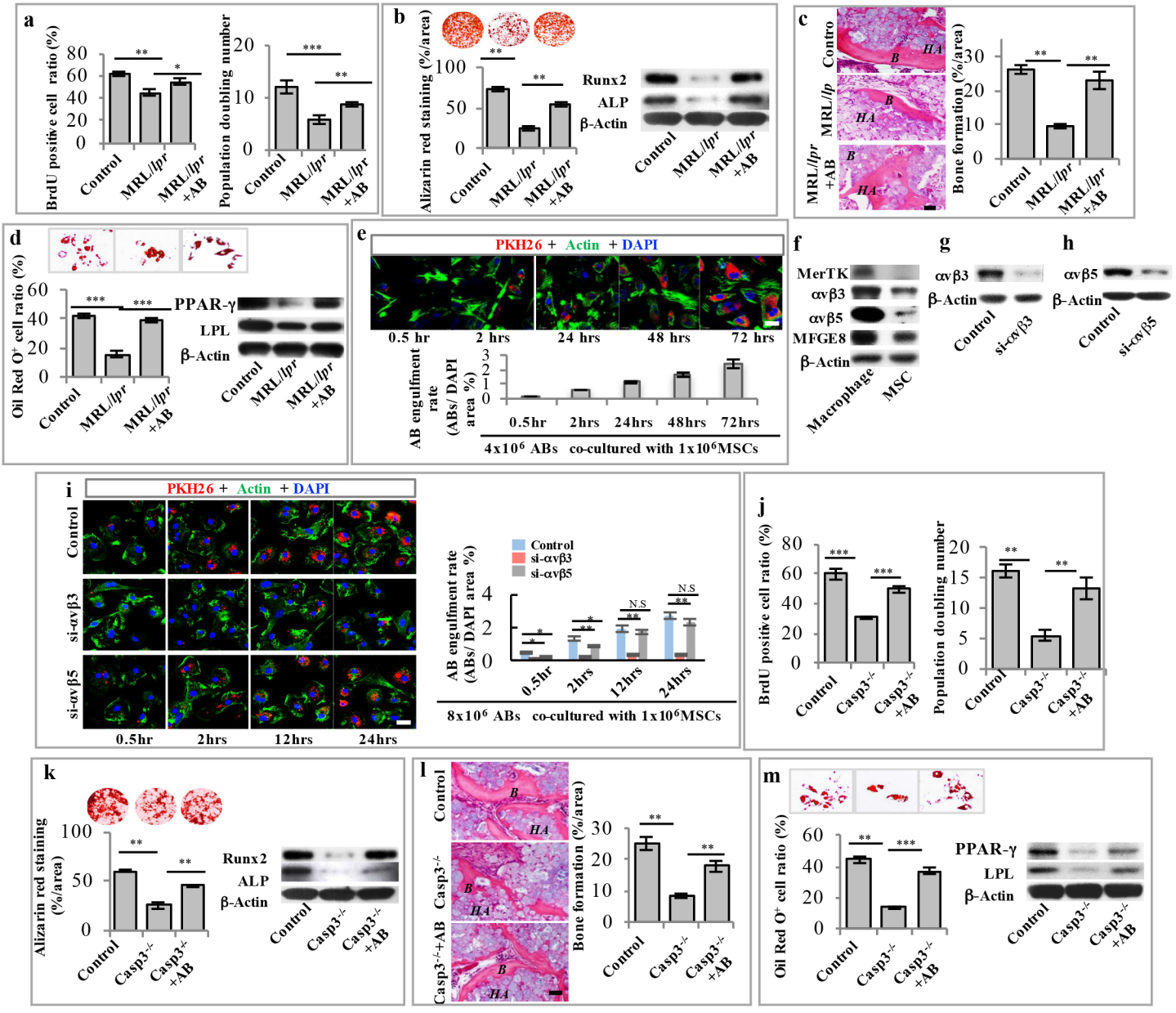

Supplementary Figure 3. *In vitro* apoptotic body treatment rescued impaired MRL/*lpr* and *Casp3*$^{-/-}$ MSCs. a, BrdU labeling and continued passage assay showed that apoptotic body treatment rescued the reduced proliferation and population doubling rates of MRL/*lpr* MSCs. **b,** Apoptotic body-treated MRL/*lpr* MSCs showed significantly increased capacities to form mineralized nodules, as assessed by alizarin red staining (n = 5), and expression of osteogenic markers Runx2 and ALP, as assessed by Western blot. **c,** Apoptotic body-treated MRL/*lpr* MSCs showed increased capacities to form new bone when implanted into immunocompromised mice subcutaneously using HA/TCP as a carrier (n= 5). H&E staining showed newly formed bone (*B*) and HA/TCP (*HA*) carrier. **d,** Apoptotic body-treated MRL/*lpr* MSCs showed significantly increased capacities to differentiate into adipocytes under the adipogenic inductive conditions, as assessed by Oil red O staining (n = 5), and expression of adipogenic markers PPAR-γ and LPL, as assessed by Western blot. **e,** When co-cultured with MSCs, PKH26-labeled apoptotic bodies (red) were engulfed by MRL/*lpr* MSCs, as assessed by immunofluorescent staining. **f,** Western blot showed that MSCs expressed αvβ3, αvβ5 and MFGE8, but not MerTK. Macrophages were used as a positive control. **g, h** Western blot showed that αvβ3 and αvβ5 siRNA knockdown effectively inhibited αvβ3 and αvβ5 expression in MSCs, respectively. **i,** αvβ3, but not αvβ5, siRNA treatment blocked MSC-mediated engulfment of apoptotic bodies in the co-culture, as assessed by immunofluorescent staining. **j,** BrdU labeling and continued passage assay showed that apoptotic body treatment rescued the reduced proliferation and population doubling rates in cultured *Casp3*$^{-/-}$ MSCs. **k,** Apoptotic body-treated *Casp3*$^{-/-}$ MSCs showed significantly increased capacities to form mineralized nodules, as assessed by alizarin red staining (n = 5), and upregulated expression of osteogenic markers Runx2 and ALP, as assessed by Western blot. **l,** Apoptotic body-treated *Casp3*$^{-/-}$ MSCs showed increased capacities to form new bone when implanted into immunocompromised mice subcutaneously using HA/TCP as a carrier (n = 5). H&E staining showed newly formed bone (*B*) and HA/TCP (*HA*) carrier. **m,** Apoptotic body-treated *Casp3*$^{-/-}$ MSCs showed significantly increased capacities to differentiate into adipocytes under the adipogenic inductive conditions, as assessed by Oil red O staining (n = 5), and upregulated expression of PPAR-γ and LPL, as assessed by Western blot. All results are representative of data generated in three independent experiments. Error bars represent the S.D. from the mean values. ***$P < 0.001$; **$P < 0.01$; *$P < 0.05$. Scale bar, 50 μm (**c**, **l**), 25 μm (**e**,**i**).