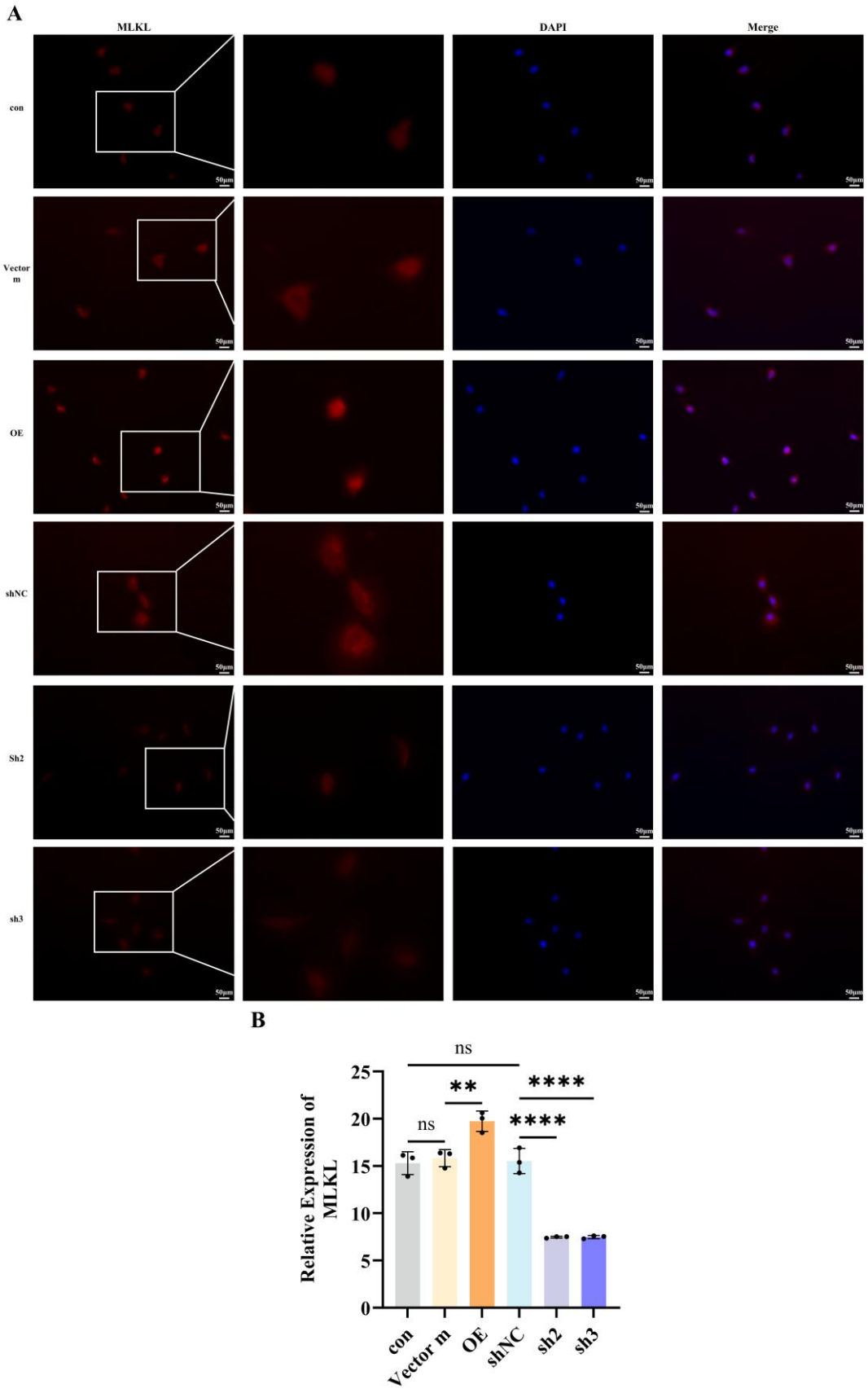
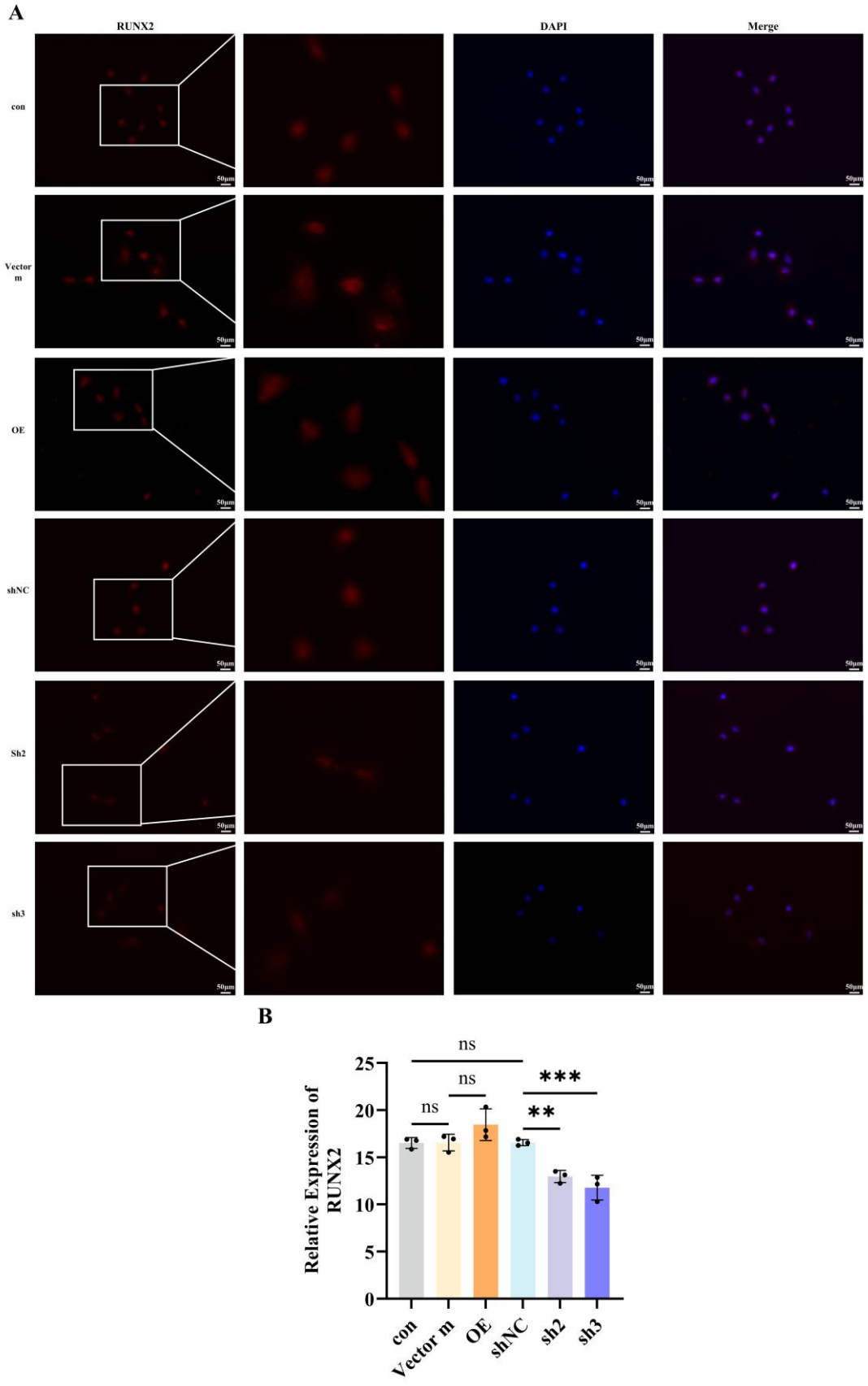


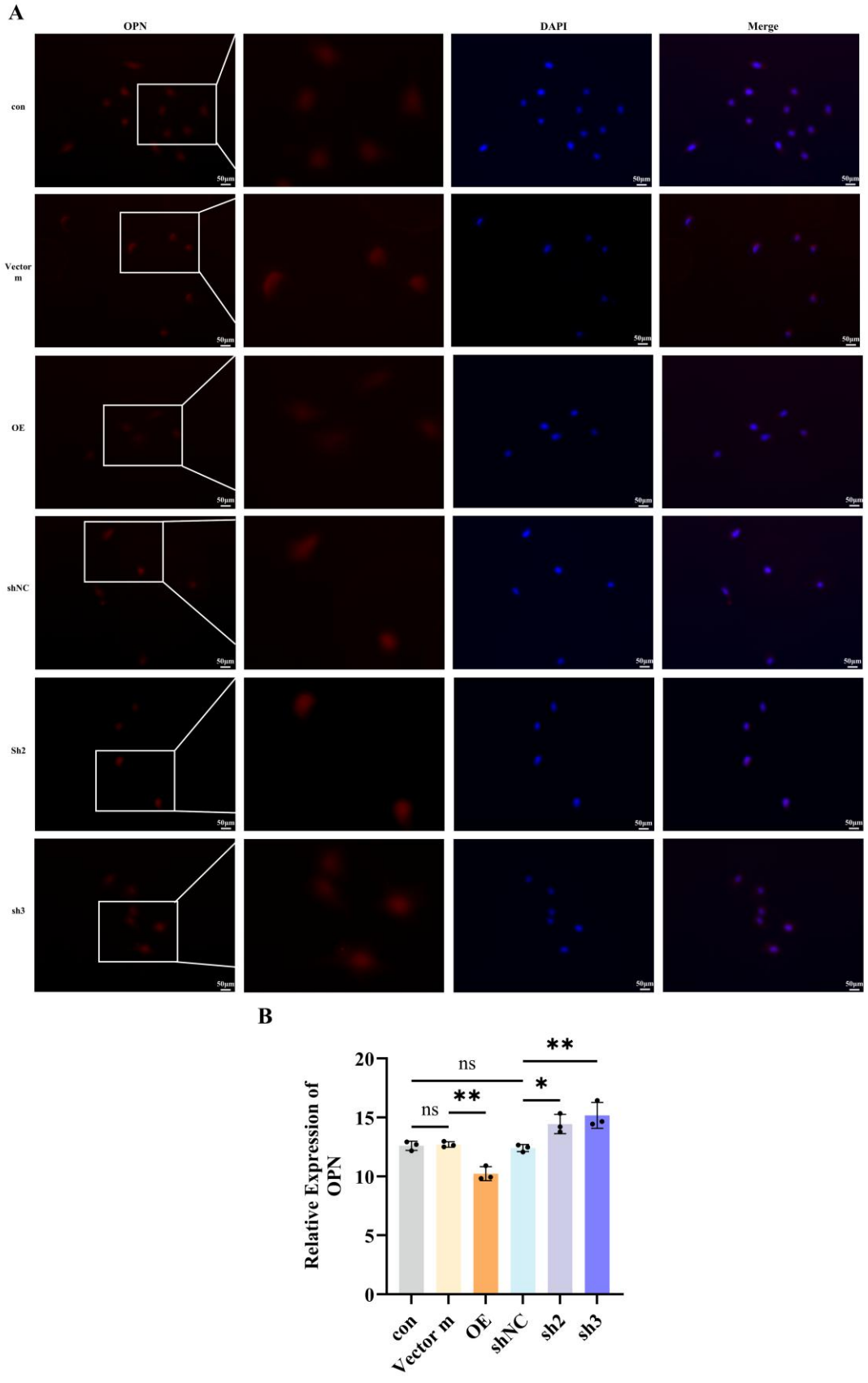
Supplementary Figure S1. Immunofluorescence validation of the BMSCs model after 3 days of

osteogenic induction. (A) Representative MLKL immunofluorescence images, confirming the validity of the BMSCs model after 3 days of osteogenic induction. **(B)** Quantitative analysis of MLKL immunofluorescence staining. Scale bar: 50 μm. ns, not significant; ** $p < 0.01$; **** $p < 0.0001$. Data are presented as the mean ± SD ($n = 3$).



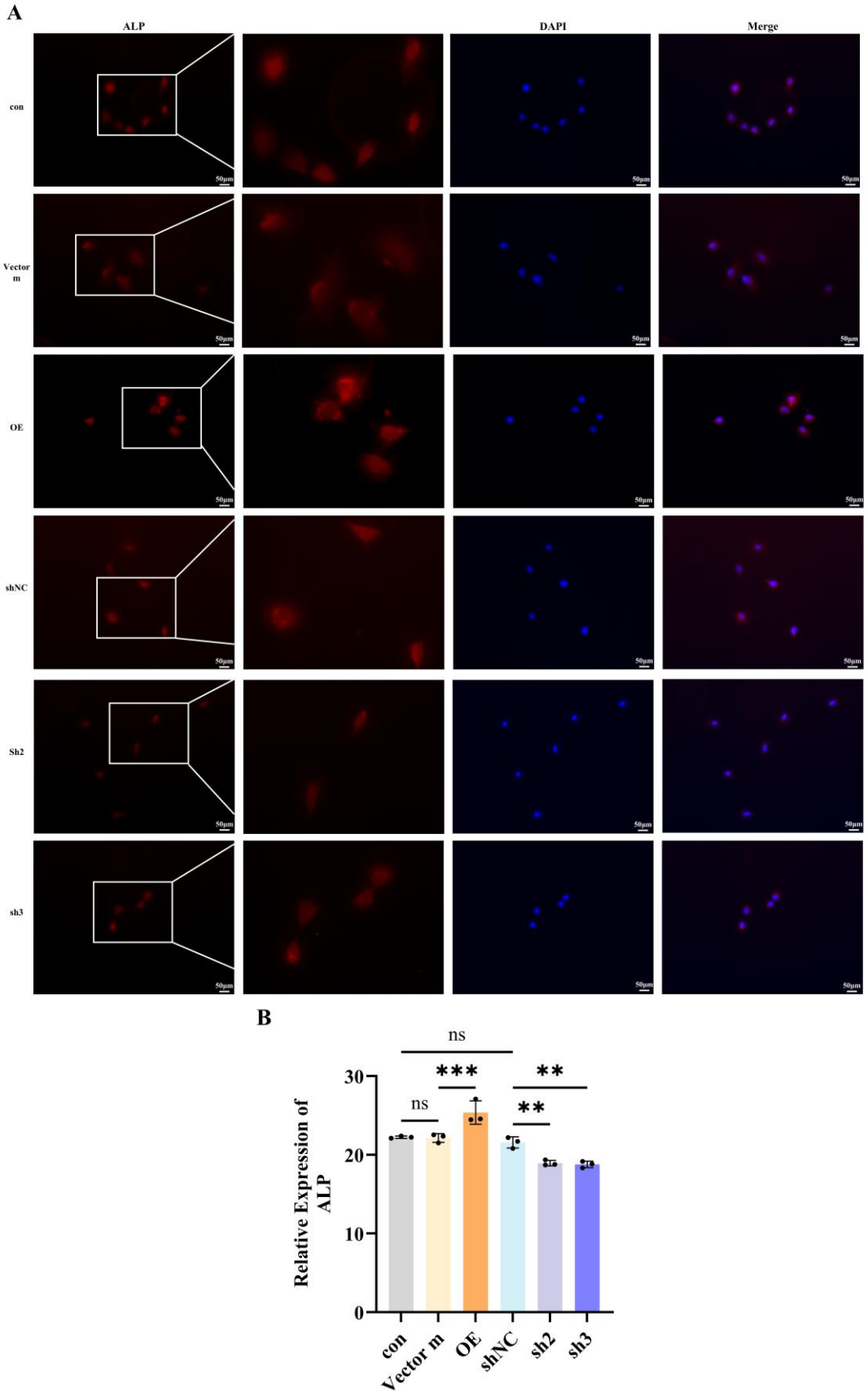
Supplementary Figure S2. Representative immunofluorescence staining Results and quantitative analyses of RUNX2 Expression after 3 Days of Osteogenic Induction. (A) Representative

immunofluorescence images of RUNX2. **(B)** Quantitative analyses of RUNX2. Scale bar: 50 μm. ns, not significant, ** $p < 0.01$, *** $p < 0.001$. Data are presented as the mean ± SD ($n = 3$).



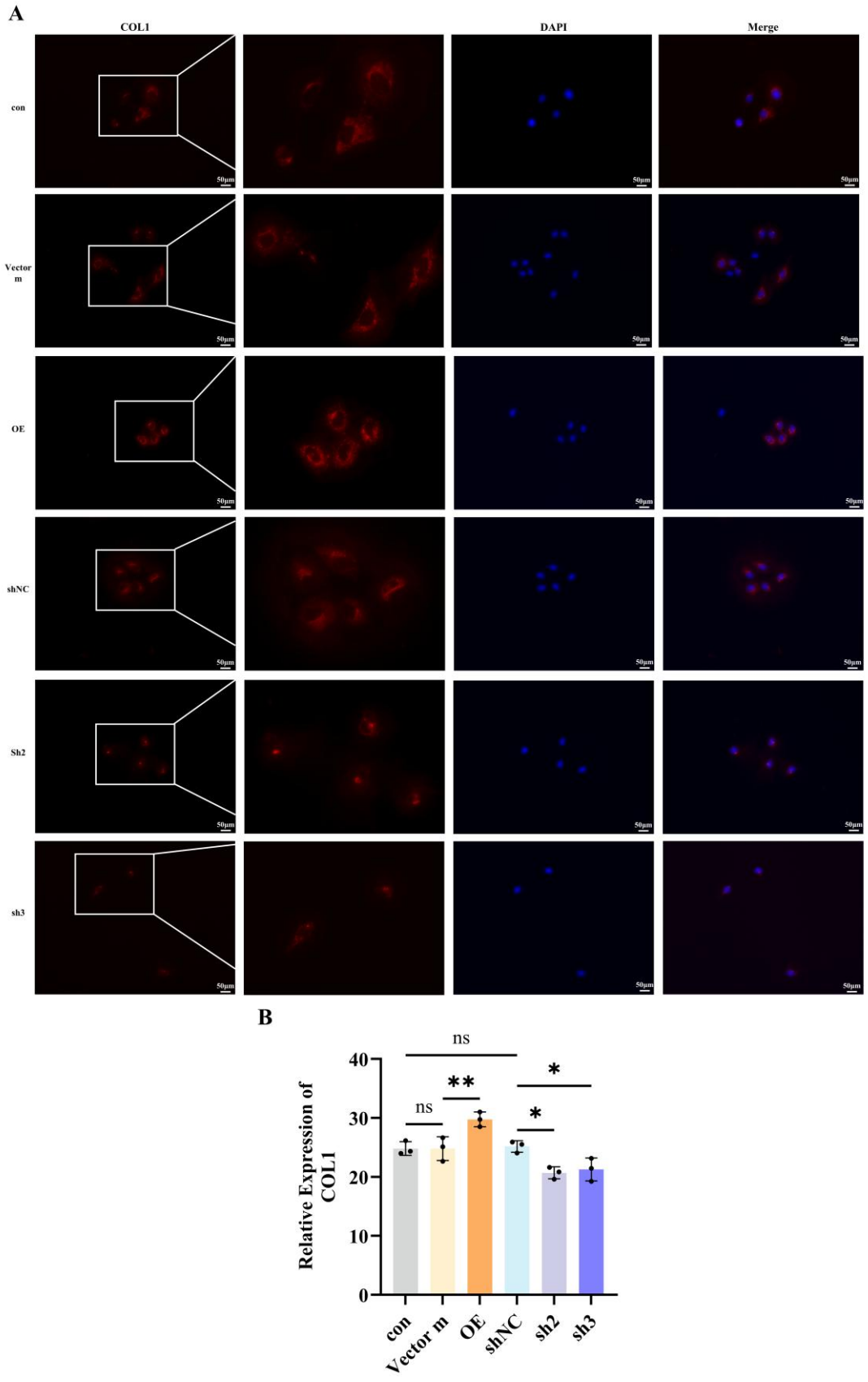
Supplementary Figure S3. Representative immunofluorescence staining Results and quantitative analyses of OPN Expression after 3 Days of Osteogenic Induction. (A) Representative

immunofluorescence images of OPN. **(B)** Quantitative analyses of OPN. Scale bar: 50 μm. ns, not significant, * $p < 0.05$, ** $p < 0.01$. Data are presented as the mean ± SD ($n = 3$).



Supplementary Figure S4. Representative immunofluorescence staining Results and quantitative

analyses of ALP Expression after 3 Days of Osteogenic Induction. (A) Representative immunofluorescence images of ALP. **(B)** Quantitative analyses of ALP. Scale bar: 50 μm. ns, not significant, ** $p < 0.01$, *** $p < 0.001$. Data are presented as the mean ± SD ($n = 3$).



Supplementary Figure S5. Representative immunofluorescence staining Results and quantitative analyses of COL1 Expression after 3 Days of Osteogenic Induction. (A) Representative

immunofluorescence images of COL1. **(B)** Quantitative analyses of COL1. Scale bar: 50 μm. ns, not significant, * $p < 0.05$, ** $p < 0.01$,. Data are presented as the mean ± SD ($n = 3$).