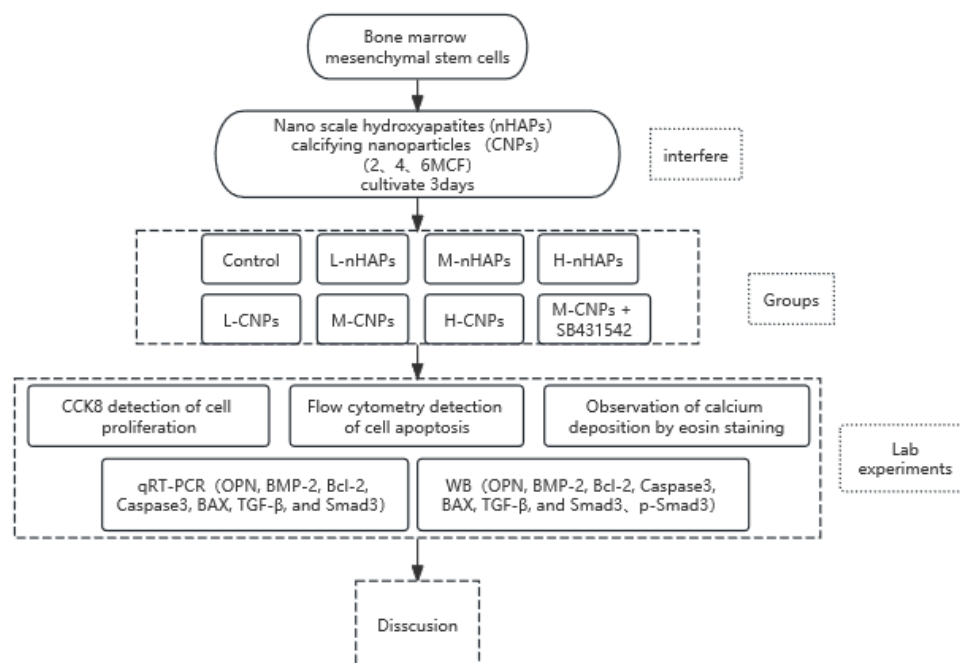


**Supplementary Figure 1 Physicochemical characterization of nHAPs.** A: SEM images; B: XRD patterns; C: EDS-derived Ca/P ratios.



**Supplementary Figure 2 Experimental flowchart.** This figure shows the complete experimental process from cell intervention to data analysis.