Ca-DEX Biomineralization-inducing Nuts Reverse Oxidative Stress and Bone Loss of Rheumatoid Arthritis

*Yaqing Liu[#a], Zongzhang Wang[#a], Yiru Wang[#a], Yushuo Feng[*a], Mengjiao Xu[a], Xiaoqian Ma[a], Qianqian Shi[a], Huaping Deng[a], Fangfang Ren[a], Yong Chen[*b], Hongmin Chen[*a]*

Y. Liu, Z. Wang, Y. Wang, Y. Feng, M. M. Xu, X. Ma, Q. Shi, H. Deng, F. Ren, Prof.

Y. Chen, Prof. H. Chen

a. State Key Laboratory of Vaccines for Infectious Diseases, Xiang An Biomedicine Laboratory, State Key Laboratory of Molecular Vaccinology and Molecular Diagnostics & Center for Molecular Imaging and Translational Medicine, National Innovation Platform for Industry-Education Integration in Vaccine Research, School of Public Health, Xiamen University, Xiamen, China

b. Department of Stomatology, School of Medicine, Xiamen University, Xiamen, China

# These authors made equal contributions to this work.

* E-mail: hchen@xmu.edu.cn; yongchen@xmu.edu.cn; fys_su@163.com
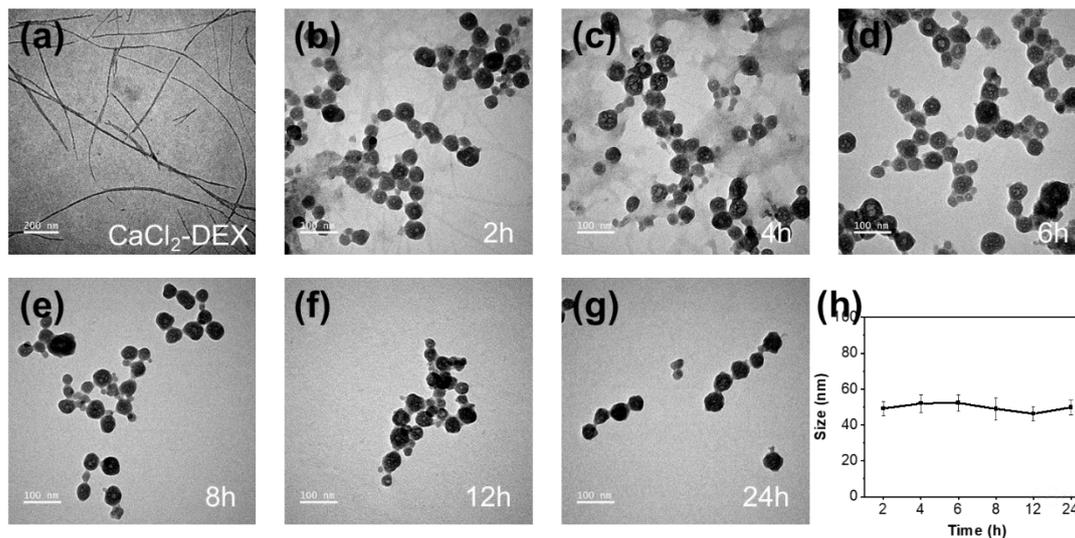
Figure S1. (a) Typical TEM image of CaCl$_2$-DEX by the coordination of free DEX with Ca^{2+} from CaCl$_2$ by stirring. (b-g) TEM images of CaCO$_3$-DEX after reaction for 2~24 h. With the increase of reaction time, the structure of nanowires gradually disappears and the nanoparticles have better dispersion. (h) Size of the CaCO$_3$-DEX based on the TEM images.
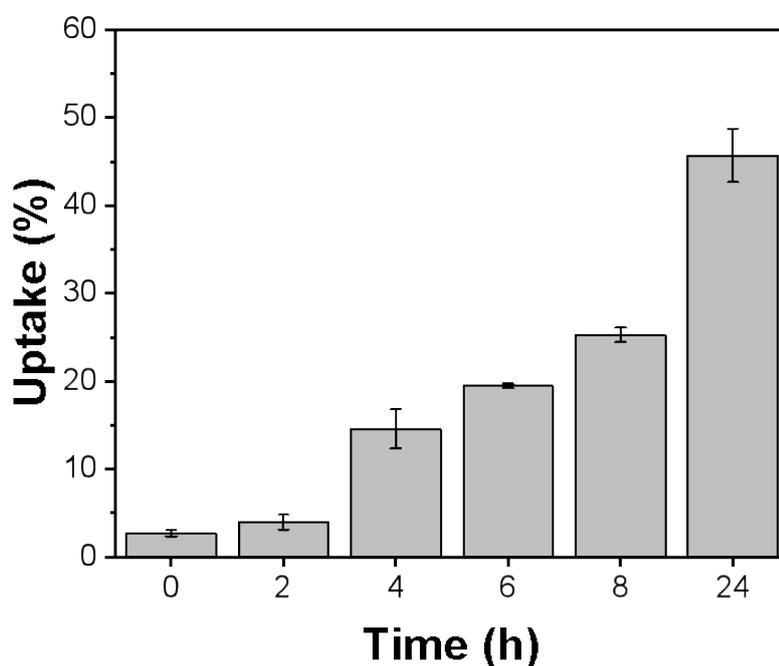
Figure S2. Quantitative analysis of cell uptake on Raw 264.7 cells incubated with CaCO$_3$-DEX.
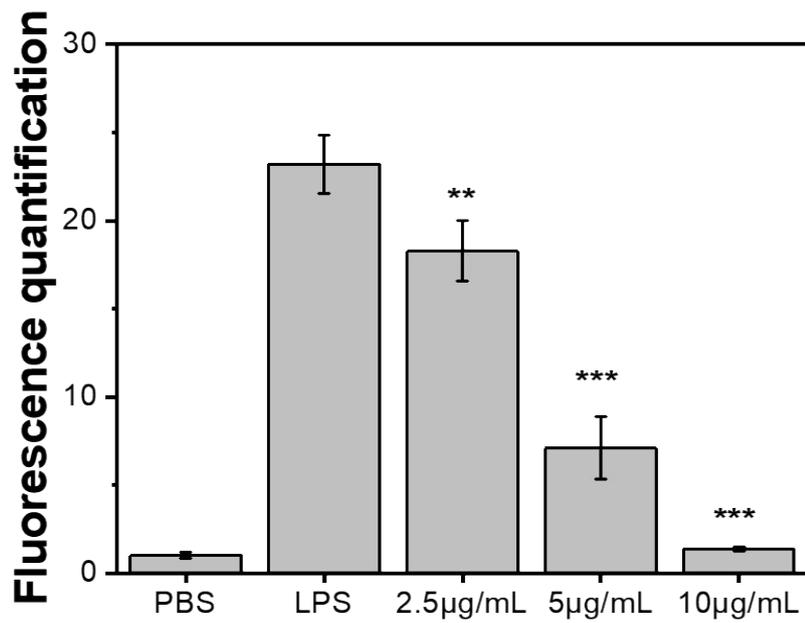
Figure S3. Quantitative analysis of ROS levels in different treatment groups. Statistical significance was calculated by One way ANOVA compared with LPS group (n = 3): *$p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.
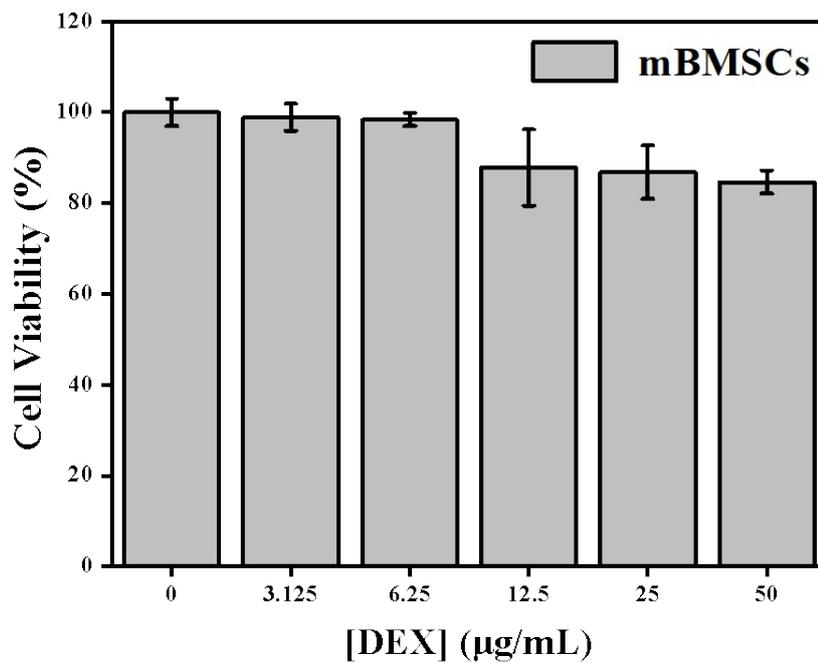
Figure S4. The cytocompatibility assessment of $CaCO_3$-DEX on mBMSCs cells by MTT assay.
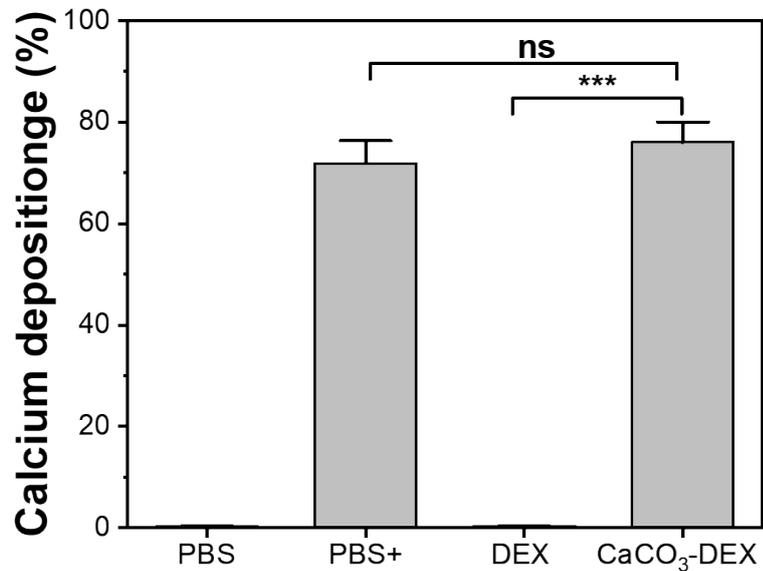
Figure S5. Quantitative analysis of the calcium deposition areas. Statistical significance was calculated by One way (n = 3): *p < 0.05, ** p < 0.01, *** p < 0.001 and ns means no significant difference.
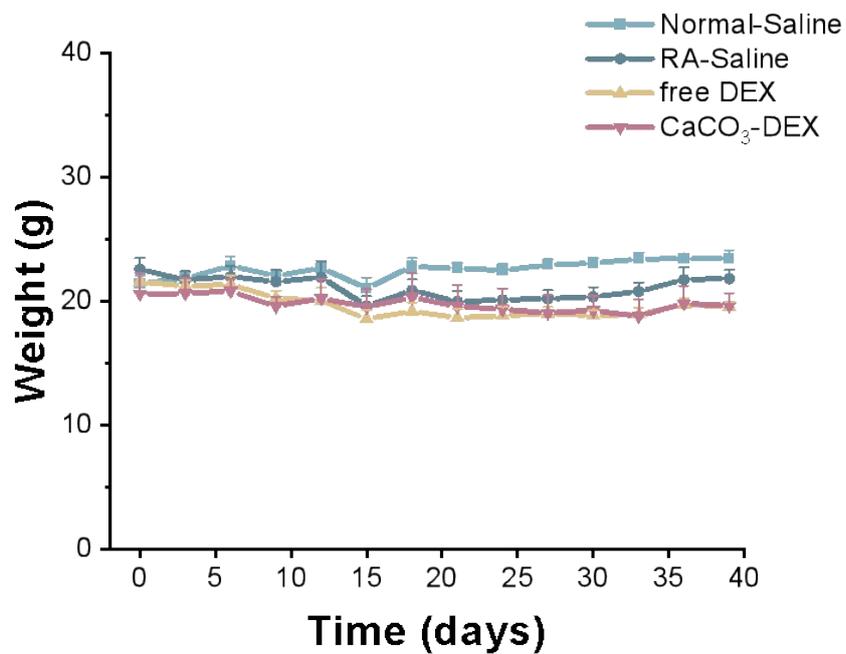
Figure S6. Weight of mice at various time points after different treatments.
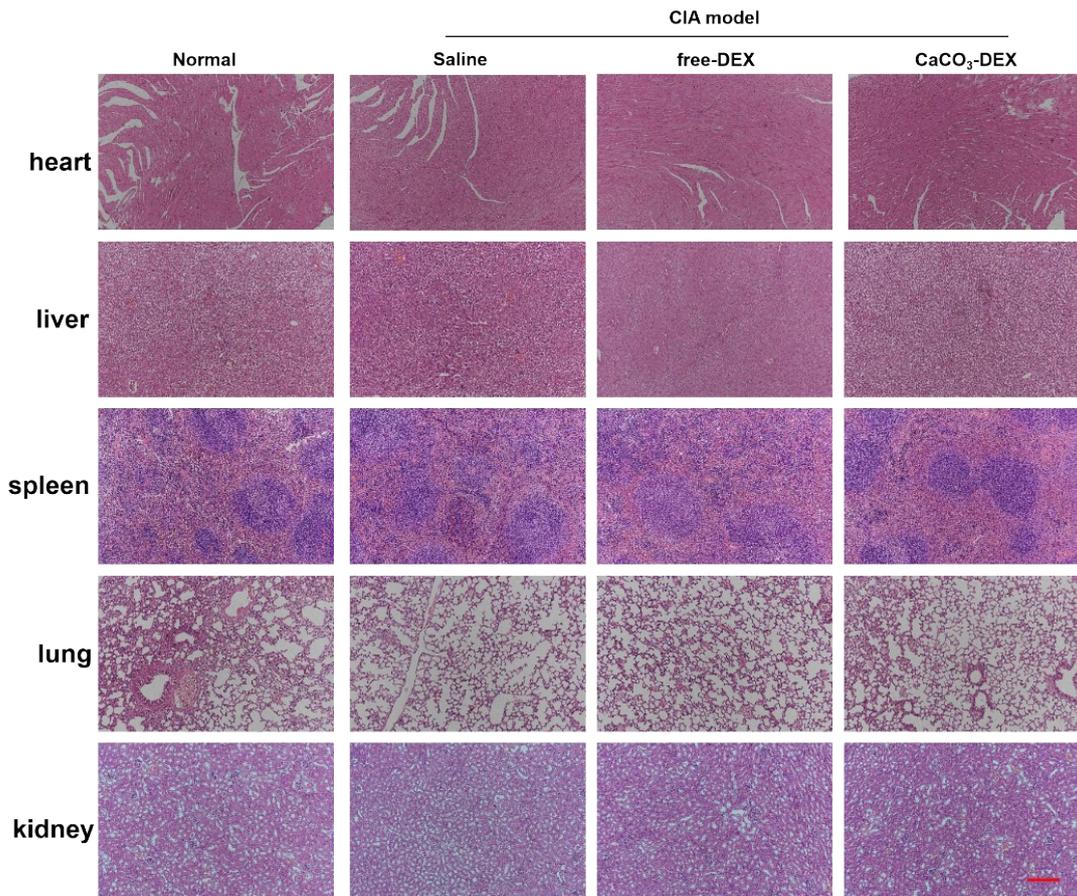
Figure S7. HE staining of the major organs (including heart, liver, spleen, lung, and kidney) of different groups. Scale bars: 200 μm.
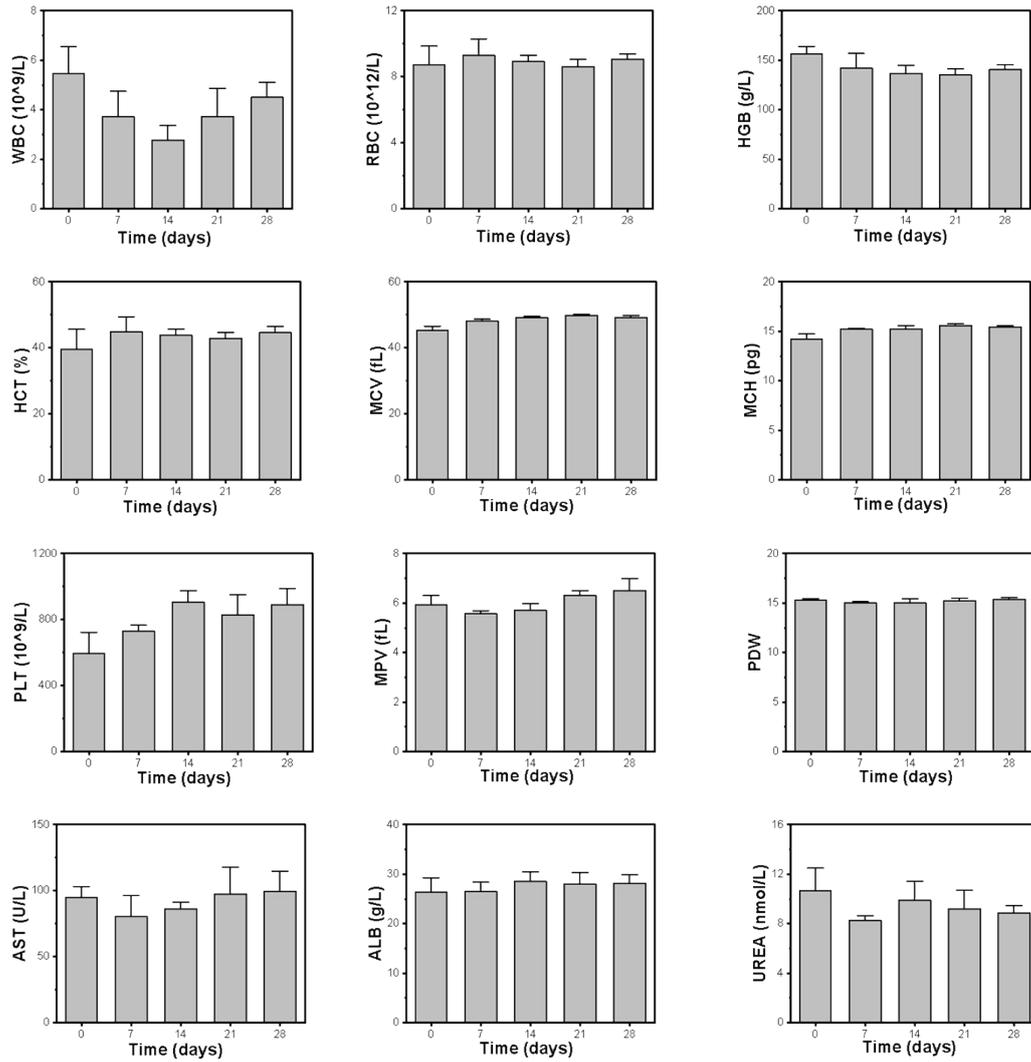
Figure S8. Hematological analysis and serum chemistry of mice treated with CaCO$_3$-DEX ([DEX]: 1mg/kg) on day 0, day 7, day14, day21 and day 28. Blood samples were collected on day 0, day 7, day14, day21 and day28. WBC, white blood cell; RBC, red blood cell; HGB, hemoglobin; HCT, red blood cell specific volume; MCV, mean corpuscular volume; MCH, mean corpuscular hemoglobin; PLT, platelets; MPV, mean platelet volume; PDW, platelet distribution width. AST, aspartate transaminase; ALB, albumin; UREA, blood urea nitrogen.