3D-printed bioactive ceramic scaffolds with MoSe2 nanocrystals as photothermal agents for bone tumor therapy

Xin Zhang,†a Yingzhi Li,b Xiaoming Dong,b Hao Wang,b Bo Chen,b Ruiyan Li,b* Yanguo Qin,b* Orest Ivasishin,a,c

a Key Laboratory of Automobile Materials of MOE, Department of Materials Science and Engineering, International Center of Future Science, Jilin University, Changchun 130012, China.
b Department of Orthopedics, The Second Hospital of Jilin University, Jilin University, Changchun 130041, PR China
c G. V. Kurdyumov Institute for Metal Physics, Kyiv, Ukraine

*Corresponding author
Ruiyan Li, liyandii@msn.cn
Yanguo Qin, qinyg@jlu.edu.cn
Fig. S1 Particle size and Zeta potential of MoSe₂ nanocrystals in aqueous solution.

Fig. S2 XPS characteristic spectra for (a) Mo and (b) Se electrons of MoSe₂ nanoparticles, and (c) Mo and (d) Se electrons of 12MS-BRT scaffolds, which demonstrated valence state of +4 and −2 for Mo and Se in the newly formed MoSe₂ layer on the scaffolds.
Fig. S3 Temperature rise curves of water (a) and BRT scaffolds (b) at different laser power densities.

Fig. S4 CLSM images of F-actin and nuclei of BMSCs on the BRT and 12MS-BRT samples.
Fig. S5 Weight loss of BRT and 12MS-BRT scaffolds after soaking in Tris–HCl solution at 37 C for 28 days.
Fig. S6 The released Ca$^{2+}$ (a), Mg$^{2+}$ (b), Si$^{4+}$ (c), Se$^{2-}$ (d) and Mo$^{4+}$ (e) ions in the Tris-HCl solutions at each time point were quantified by inductively coupled plasma-atomic emission spectrometry.

Fig. S7 The relative mineralization quantification of different groups at 14 days.