

Supporting Information

Ag/AgBr loaded Mesoporous Silica for Rapid Sterilization and Promotion of Wound Healing

*Chen Jin^a, Xiangmei Liu^a, Lei Tan^a, Zhenduo Cui^b, Xianjin Yang^b, Yufeng Zheng^c,
Kelvin Wai Kwok Yeung^d, Paul K. Chu^e, Shuilin Wu^{a,b*}*

^a Hubei Collaborative Innovation Center for Advanced Organic Chemical Materials,
Ministry-of-Education Key Laboratory for the Green Preparation and Application of
Functional Materials, Hubei Key Laboratory of Polymer Materials, School of Materials
Science & Engineering, Hubei University, Wuhan 430062, China

^b School of Materials Science & Engineering, Tianjin University, Tianjin 300072, China

^c State Key Laboratory for Turbulence and Complex System and Department of
Materials Science and Engineering, College of Engineering, Peking University, Beijing
100871, China

^d Department of Orthopaedics & Traumatology, Li KaShing Faculty of Medicine, The
University of Hong Kong, Pokfulam, Hong Kong 999077, China

^e Department of Physics and Department of Materials Science and Engineering, City
University of Hong Kong, Tat Chee Avenue, Kowloon, Hong Kong 999077, China

Table S1. The element content of MSNs, Ag/AgBr/MSNs-0.34 and Ag/AgBr/MSNs-

0.85 by XPS.

Element	Br 3d	Si 2p	C 1s	Ag 3d	N 1s	O 1s
Atomic (%) of MSNs	0	20.2	31.81	0	0.09	47.9
Atomic (%) of Ag/AgBr/MSNs-0.34	0.09	11.02	51.5	0.23	3.73	33.43
Atomic (%) of Ag/AgBr/MSNs-0.85	0.13	10.86	51.07	0.85	3.70	33.39

Table S2. The content of Br in Ag/AgBr/MSNs-0.85 after 0, 5, 10 and 15 min irradiation.

Irradiation time (min)	0	5	10	15
Content of Br in Ag/AgBr/MSNs-0.85 (atom %)	0.35	0.34	0.43	0.38

Table S3. The concentration of $\text{Na}_3(\text{Ag}(\text{S}_2\text{O}_3))$ after dissolve the AgBr in Ag/AgBr/MSNs-0.85 after 0, 5, 10 and 15 min irradiation.

Irradiation time (min)	0	5	10	15
Concentration of $\text{Na}_3(\text{Ag}(\text{S}_2\text{O}_3))$ (mg/L)	60.20	55.69	53.13	51.63

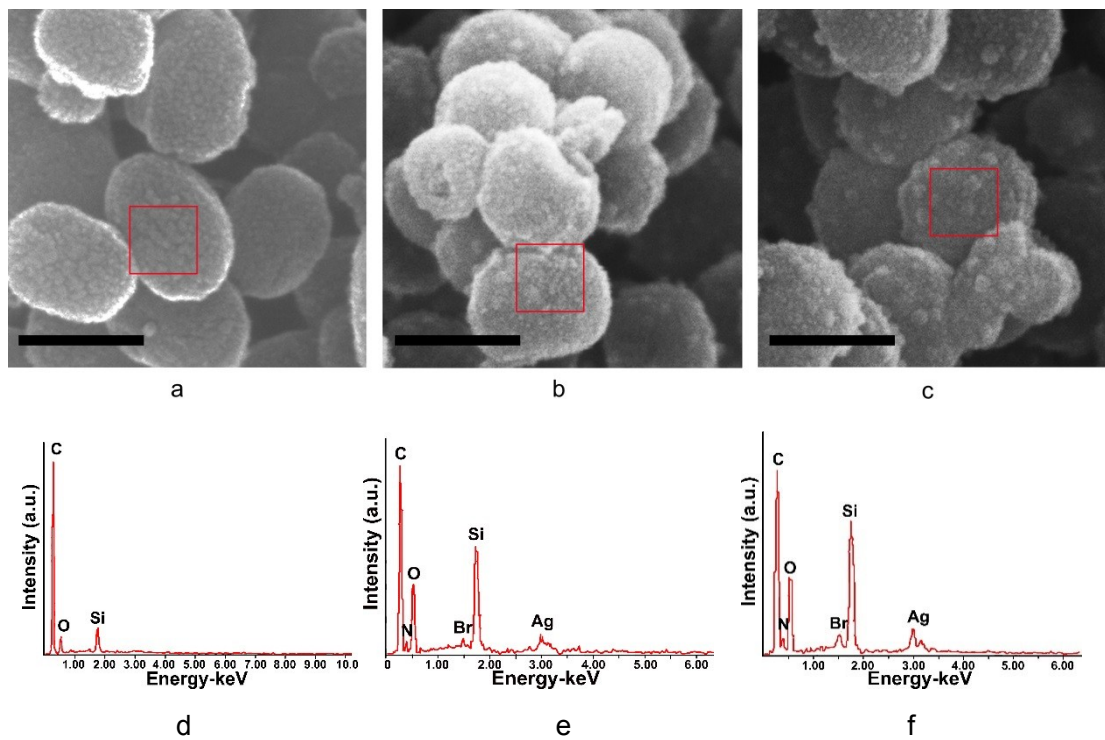
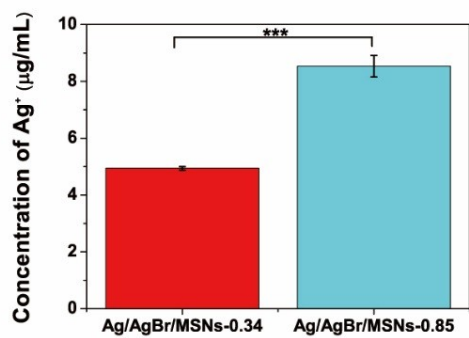
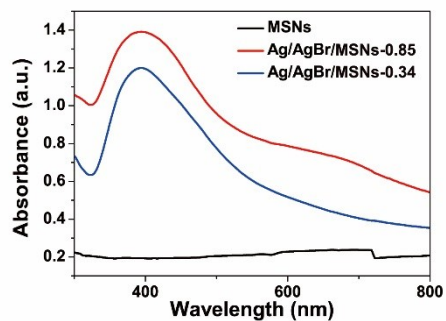


Figure S1. a) The SEM of MSNs. b) The SEM of Ag/AgBr/MSNs-0.34. c) The SEM of Ag/AgBr/MSNs-0.85. d) The EDS of MSNs (red frame). e) The EDS of Ag/AgBr/MSNs-0.34 (red frame). f) The EDS of Ag/AgBr/MSNs-0.85. Scale bars, 100 nm.



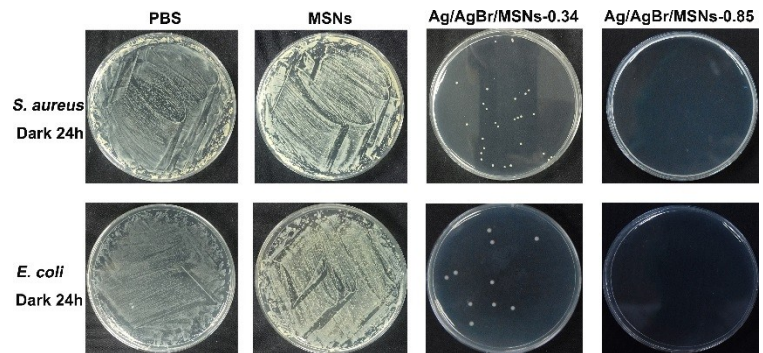
a



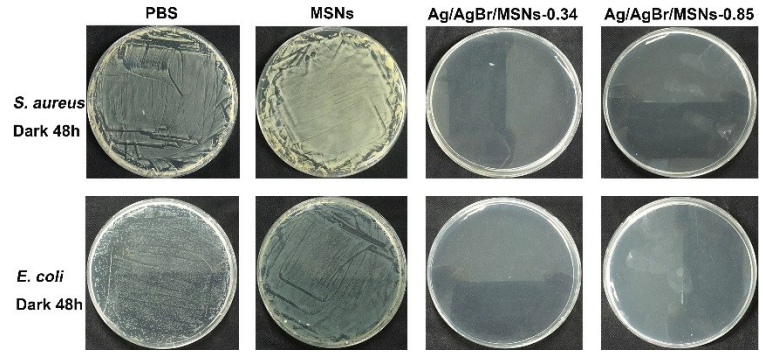
b

Figure S2. a) Content of Ag element of Ag/AgBr/MSNs-0.34 and Ag/AgBr/MSNs-0.85.

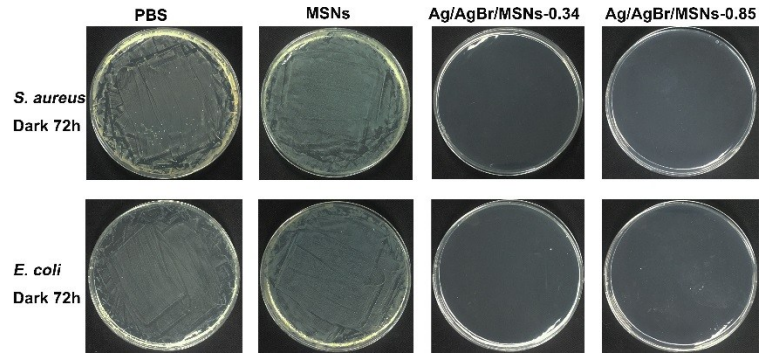
b) The UV-vis absorption spectra of Ag/AgBr/MSNs-0.34 and Ag/AgBr/MSNs-0.85.



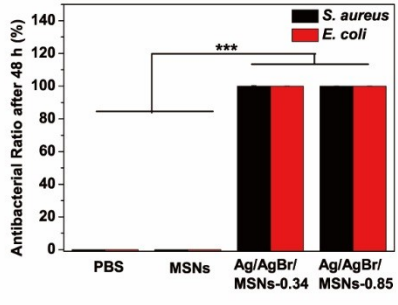
a



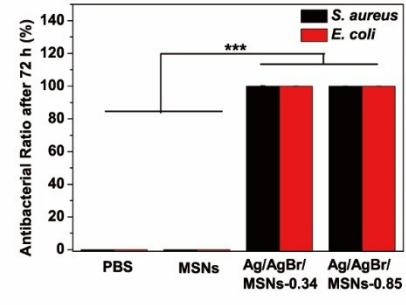
b



c



d



e

Figure S3. The spread plate method of *S. aureus* and *E. coli* culture with PBS, 500 $\mu\text{g/mL}$ MSNs, Ag/AgBr/MSNs-0.34 and Ag/AgBr/MSNs-0.85 for a) 24 h, b) 48 h and c)

72 h. The antibacterial Ratio after d) 48 h and e) 72 h (n = 3, mean \pm SD.).

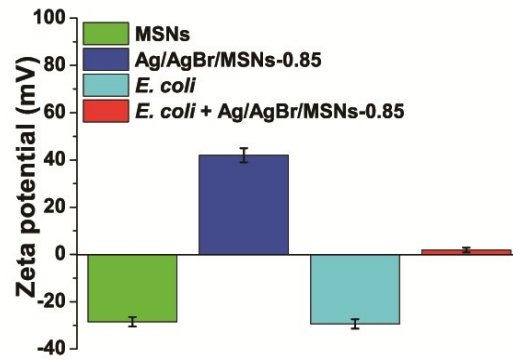
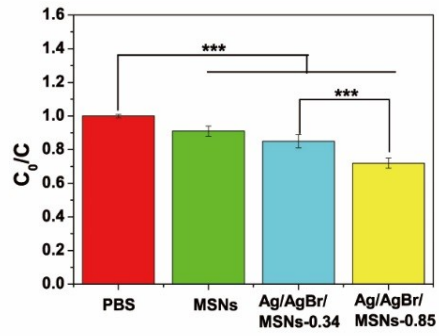
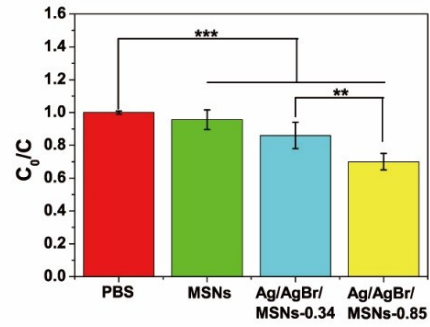


Figure S4. The zeta potential of MSNs, Ag/AgBr/MSNs-0.85, *E. coli* and *E. coli* with Ag/AgBr/MSNs-0.85



a



b

Figure S5. The Protein Leakage Analysis for a) *S. aureus* and b) *E. coli* after cultured with the samples for 15 min under irradiation (n = 3, mean \pm SD.).

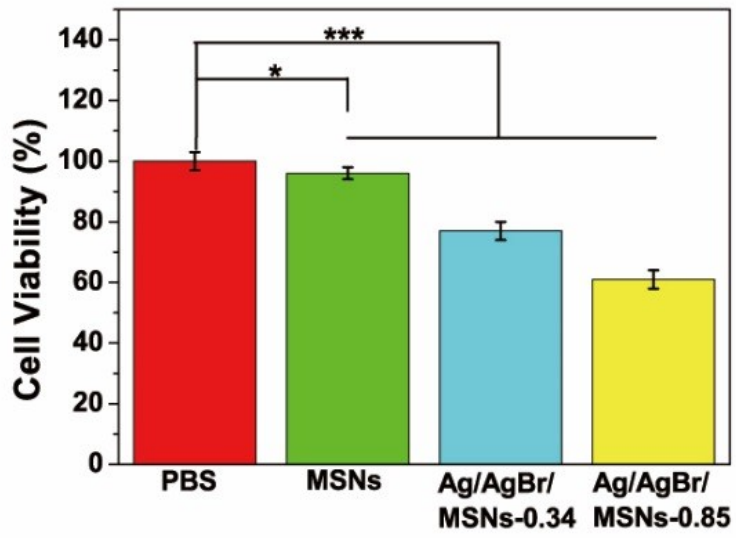


Figure S6. *In vitro* evaluation of cell viability (n = 3, mean \pm SD.).

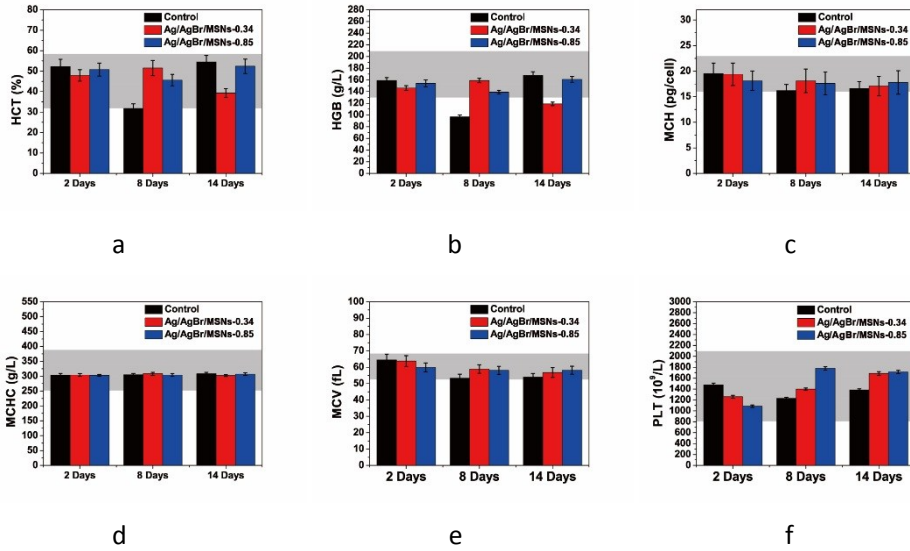


Figure S7. The hematology data of mice treated with samples. These data are collected at different days. a) hematocrit (HCT), b) hemoglobin (HGB), c) mean corpuscular hemoglobin (MCH), d) mean corpuscular hemoglobin concentration (MCHC), e) mean corpuscular volume (MCV) and f) platelet (PLT) levels. (n = 3, mean \pm SD.)