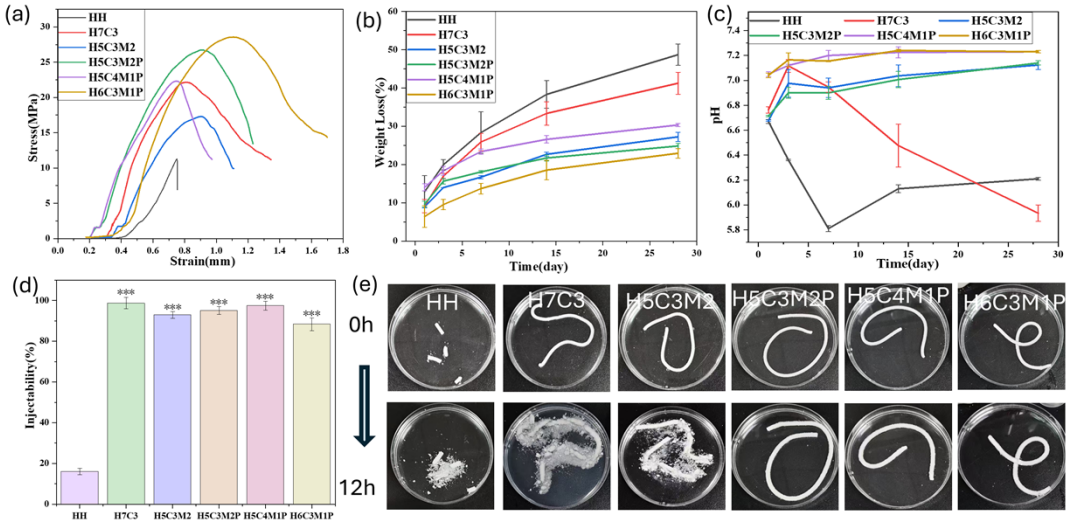

Figure S1. Physical properties and characterization of bone cement. (a) Stress-strain curve; (b) Weight loss rate and (c)the variation of pH value in PBS; (d) Quantitative results of injectability; (e) The injectability and anti-collapse properties of bone cements.

Table S1. The ion release kinetics model of Ca^{2+} and Mg^{2+}

Cement Label	Fitting curve (Ca^{2+})	R^2	Fitting curve (Mg^{2+})	R^2
HH	$y=86.87t^{0.40}$	0.9960	-	-
H7C3	$y= 42.52t^{0.43}$	0.9934	-	-
H5C3M2	$y=5.78t^{0.93}$	0.9989	$y=165.40t^{0.15}$	0.9328
H5C3M2P	$y=11.81t^{0.63}$	0.9838	$y=113.99t^{0.20}$	0.9101
H5C4M1P	$y=19.16t^{0.66}$	0.9923	$y=51.12t^{0.32}$	0.9350
H6C3M1P	$y=18.18t^{0.63}$	0.9903	$y=42.28t^{0.36}$	0.9470

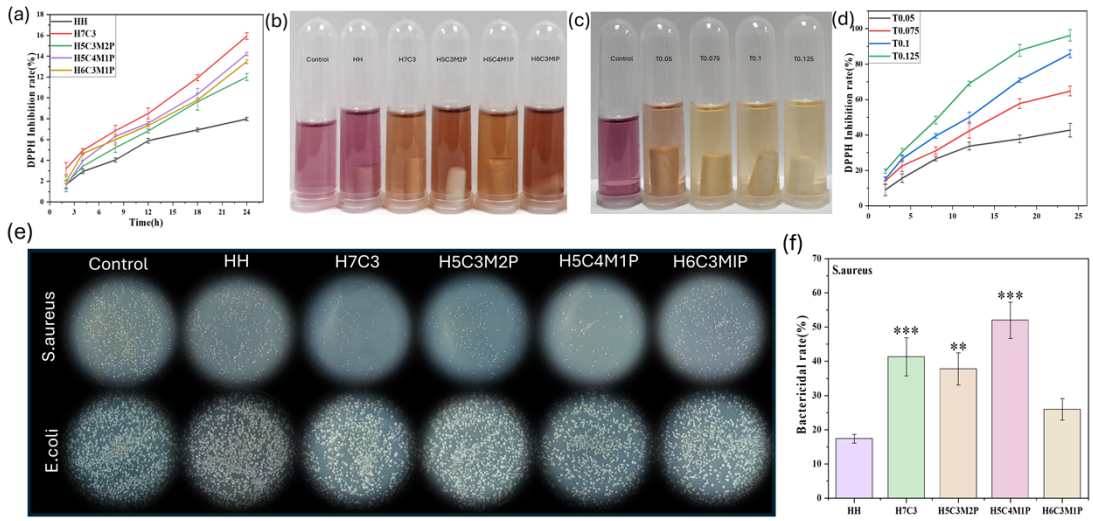

Figure S2. Antioxidant activity and antibacterial properties of bone cement. (a) Inhibition rate of DPPH by bone cement; (b) The color of ethanol solution containing DPPH after soaking in bone cement for 24 hours; (c, d) Inhibition rate of DPPH by bone cement with different HT concentrations and changes in DPPH solution color after co-culture for 24 hours; (e) The growth results of bacteria on solid culture media; (f) The bactericidal rate of S. aureus after co-cultivation for 12 hours.

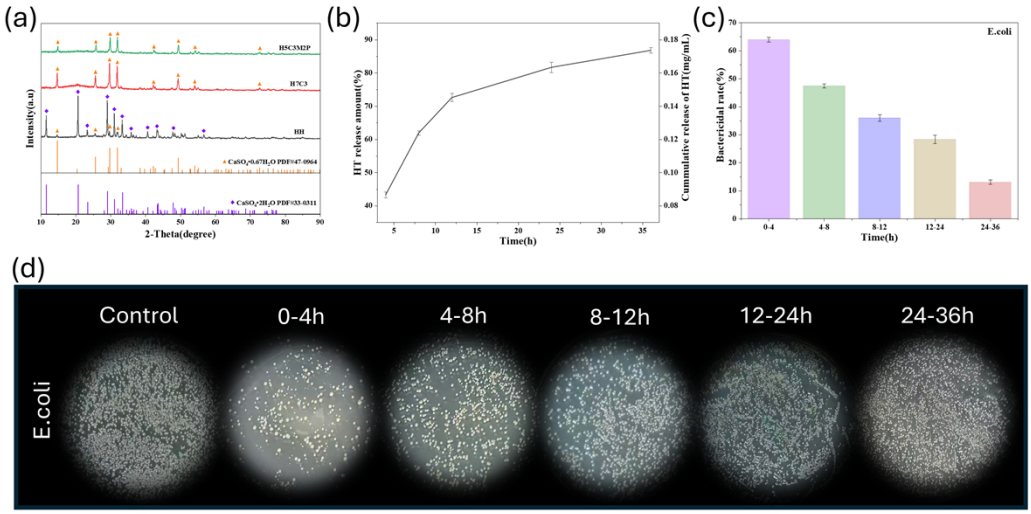

Figure S3. (a) XRD pattern of composite bone cement; (b)The release kinetic curve of HT; (c) The bactericidal rate of Escherichia coli exposed to extraction media collected at consecutive time intervals; (d) Antibacterial effect of extraction solution at different time periods.