Supplementary material

Synergies of submicron/microporous structures and gallium phytate coating on polyetherketoneketone composite for facilitating synostosis and resisting infection

Ping Sun[a, c], Ye Ying[a], Shangyu Xie[a], Guanghui Wang[a], Jie Wei [a*], Yunfei Niu [b, d*]

[a] Shanghai Key Laboratory of Advanced Polymeric Materials, School of Materials Science and Engineering, East China University of Science and Technology, 200237, China

[b]Department of Trauma Orthopaedics, the first affiliated hospital of Naval Medical University, Shanghai 200433, China

[c] Department of Orthopedics, Shanghai Eighth People's Hospital, Shanghai, 200235, China

[d]Department of Orthopaedics, Shidong Hospital affiliated to University of Shanghai for Science and Technology, Shanghai 200438, China

* Corresponding authors.

E-mail address: jiewei7860@sina.com (Jie Wei), nyunfei1219@163.com (Yunfei Niu)

sunping1127@126.com (P. Sun).

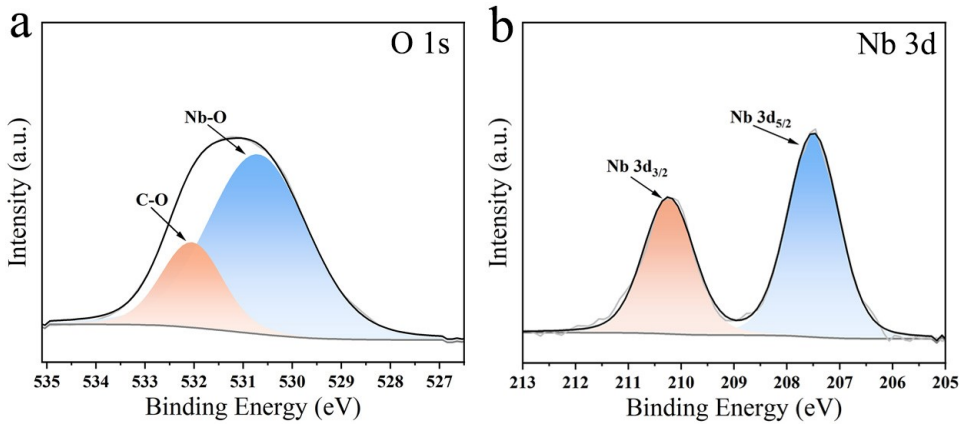

Fig. S1 High-resolution XPS of O 1s (a) and Nb 3d (b) of NP.

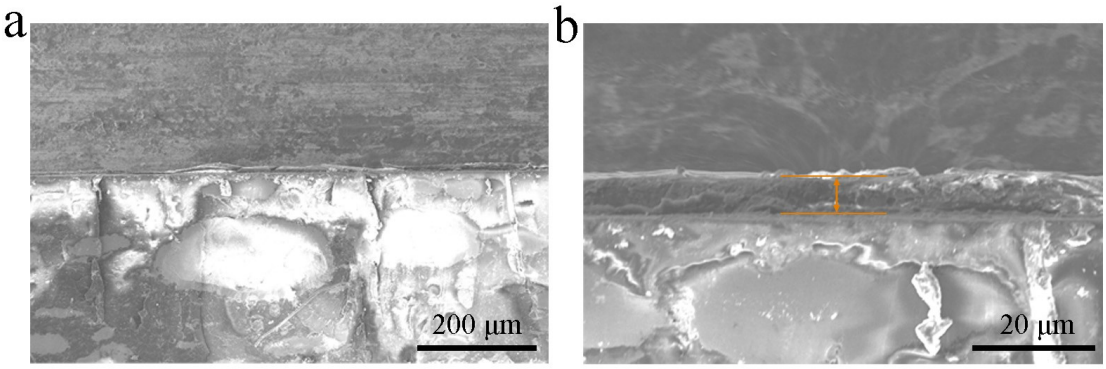

Fig. S2 Cross-sectional SEM images (a, b) of NPsmG under different magnification, arrow represents the coating.

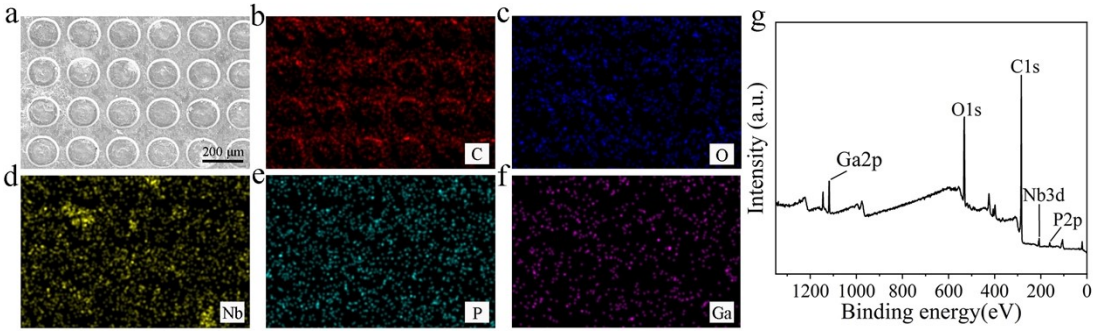

Fig. S3 SEM images (a) and EDS mapping images of elements of C (b), O (c), Nb (d), P (e) and Ga (f) distributed on the NPsmG surface, and XPS (g) of NPsmG.

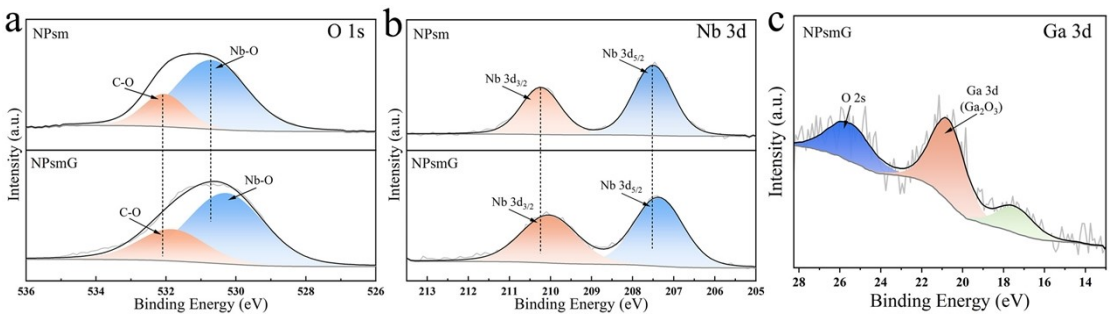

Fig. S4 High-resolution XPS of O 1s (a) and Nb 3d (b) of NPsm and NPsmG, and Ga 3d (c) of NPsmG.

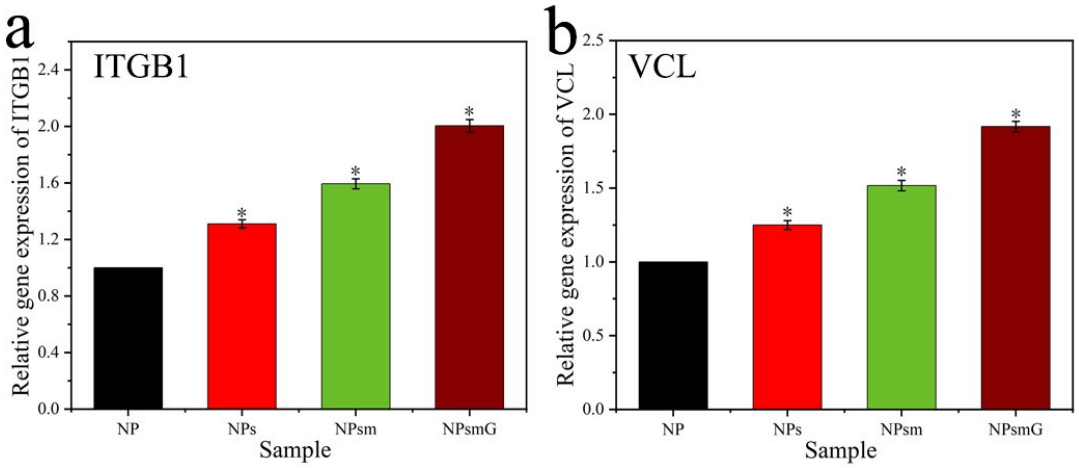

Fig. S5 Expressions of adhesion-related genes of TGB1 (a) and VCL (b) of BMSC cells cultured on different samples for 3 days.

Table S1 Primer sequences of adhesion genes

Gene	Primer sequences(5'-3')
GAPDH	forword: GGAATCCACTGGCGTCTTCA reverse: GGTTCACGCCCATCACAAAC
ITGB1	forword: ACATTGATGACTGCTGGTTCTA reverse: AATAAGAACAATTCCGGCAACC
VCL	forword: AGCAGGACCCAGGAGTTTATG reverse: TGTGGCACTGAGAGGAGTTAG

Table S2 Primer sequences of osteogenic genes

Gene	Primer sequences(5'-3')
GAPDH	forword: GGAATCCACTGGCGTCTTCA reverse: GGTTCACGCCCATCACAAAC
Runx2	forword: TCTTCCCAAAGCCAGAGCG reverse: TGCCATTCGAGGTGGTC
ALP	forword: GACGTCTCCATGGTGGATTATGC reverse: CCCAGGCACAGTGGTCAAG
OCN	forword: GCCCTGACTGCATTCTGCCTCT reverse: TCACCACCTTACTGCCCTCCTG
OPN	forword: CCAAGCGTGGAAACACACAGCC reverse: GGCTTTGGAACTCGCCTGACTG

Table S3 Primer sequences of inflammatory genes

Gene	Primer sequences(5'-3')
GAPDH	forword: AGGTCGGTGTGTGAACGGATTTG reverse: TGTAGACCATGTAGTTGAGGTCA
CD206	forword: TTCCATCGAGACTGCTGCTG reverse: CCAGAGGGATCGCCTGTTTT
CCR7	forword: ATGACGTCACCTACAGCCTG reverse: CAGCCCAAGTCCTTGAAGAG
IL-1β	forword: TGGAGAGTGTGGATCCCAAG reverse: GGTGCTGATGTACCAGTTGG
IL-4	forword: GTCATCCTGCTCTTCTTTCTC reverse: GAGTGCATGGCGTCCCTTCTC
IL-10	forword: GAGAAGCATGGCCCAGAAATC reverse: GAGAAATCGATGACAGCGCC
IL-6	forword: ATAGTCCTTCCTACCCCAATTTCC reverse: GATGAATTGGATGGTCTTGGTCC
TNF-α	forword: CTGAACTTCGGGGTGATCGG

	reverse: GGCTTGTCACTCGAATTTTGAGA
iNOS	forword: CACCAAGCTGAACTTGAGCG
	reverse: CGTGGCTTTGGGCTCCTC

Table S4 MIC and MBC of Ga^{3+} of NPsmG against *E. coli* and *S. aureus*

Bacteria	MIC (mg/L)	MBC (mg/L)
E. coli	4	8
S. aureus	6	8