Supplementary Material

Materials and Methods

Peri-implantitis is a biofilm-induced inflammatory process that Gram-negative anaerobic rods dominate those biofilms[1]. A single evaluation time point was used to primarily detect the antibacterial concentration of Ag^+. A peri-implantitis subject was diagnosed and selected by a professional prosthodontist from department of dental implant, West China Hospital of Stomatology. Biofluid was obtained from the peri-implant pocket using a blunt metal probe (diameter 0.7 mm) and then equivalently inoculated onto modified salmonella shigella agar with 5% goat blood and 1-10‰$AgNO_3$（wt‰）. Culture dishes were incubated at 37° C under anaerobic conditions (10% H_2 and 5% CO_2 in N_2) for 3 days[2]. Each sample was then divided and subjected to macroscopic colony analysis. Meanwhile, 200 uL of P. gingivalis ATCC 33277 was separately grown in 10ml brain heart infusion supplemented with 0.5 ug/mL Vitamin K1,5 ug/mL Hemin and 1-10‰$AgNO_3$.After 3 days of cultivation, centrifuged and re-suspended in 10 ml of PBS for OD test. The bacterial culture and OD test were performed as previously described[3].At least 3 parallel tests were set for all measurements.

Results

After 3 days' cultivation, lots of black bacterial colonies were detected in negative control. Compared with negative control, 4‰ Ag^+ concentration exhibited some bacteriostatic activity while almost no black colonies were found in 10‰ $AgNO_3$ group (Fig 1SA). In short, the mount of bacterial colonies was negatively correlated with the concentration of Ag^+. Meanwhile, the OD results of the P. gingivalis mount revealed the same trend. Compared with negative and 1‰ group, 4‰-10‰ Ag^+ concentration obviously inhibited the P. gingivalis growth. Especially in 7‰ and 10‰ group, there were almost no significant differences compared with the black group(Fig 1SB).

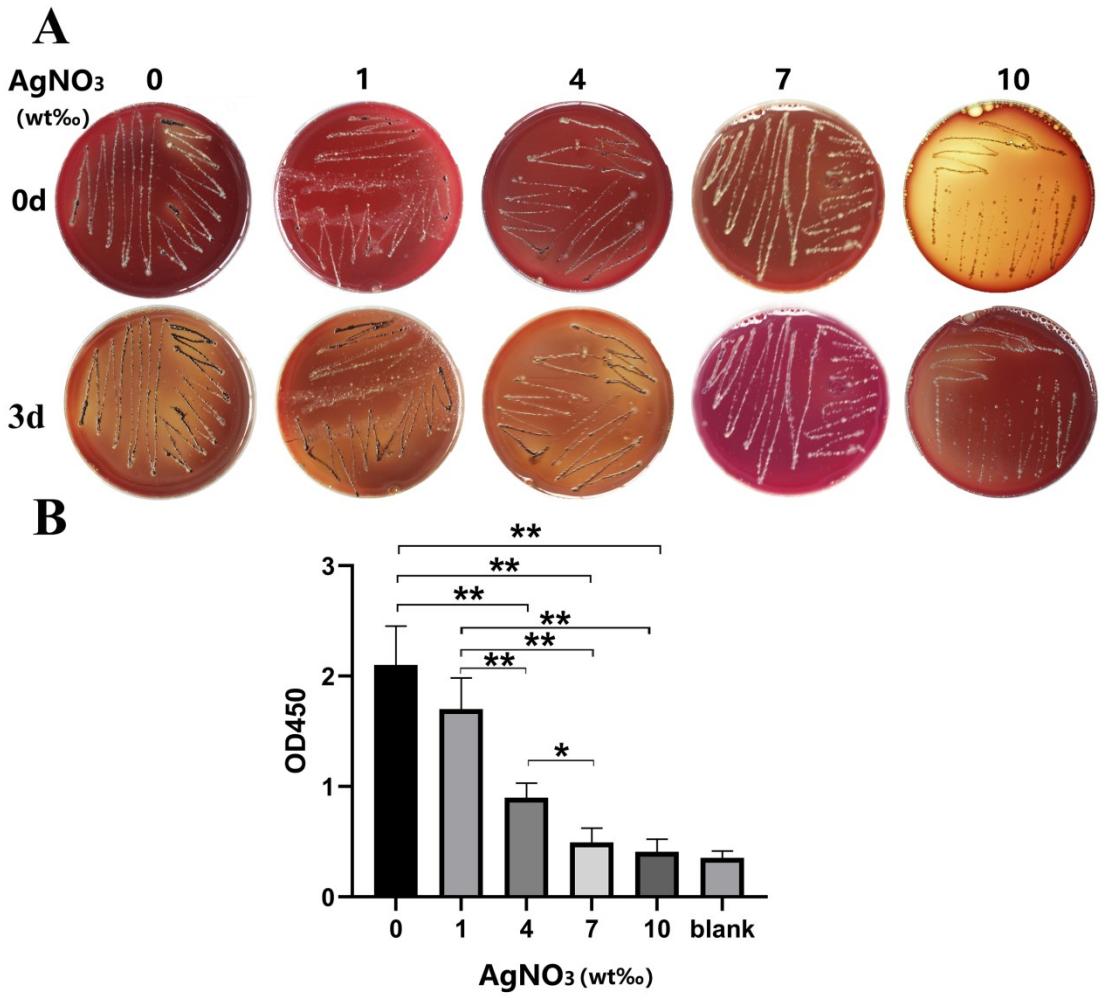
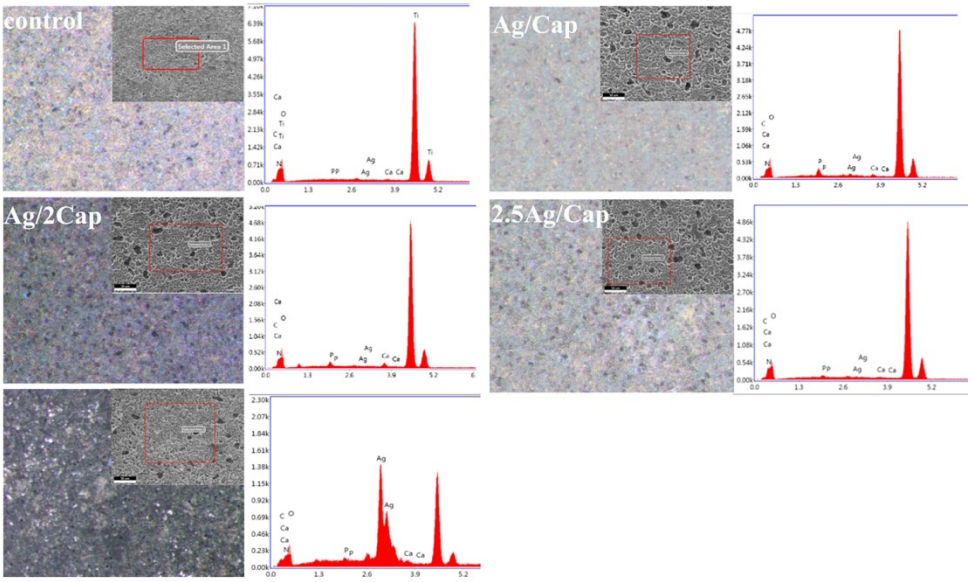


Fig. S1: Different Ag^+ concentration on the bacterial proliferation of peri-implantitis in vitro. (A) the impact of various Ag^+ concentrations on the bacterial proliferation from peri-implantitis pocket in vitro. (B) the OD test of various Ag^+ concentrations on the P. gingivalis proliferation. *:$P < 0.05$, **:$P < 0.01$.

A



B

Wt%(n=4)	Ag	Ca	P
control	0.01±0.01	0.43±0.12	0.04±0.02
0.5Ag/Cap	2.18±0.14	5.66±0.05	3.19±0.11
0.5Ag/2Cap	3.22±0.06	7.4±0.11	3.73±0.13
Ag/Cap	3.45±0.04	8.09±0.08	4.37±0.07
Ag/2Cap	5.58±0.18	10.42±0.12	6.73±0.13
1.5Ag/Cap	6.62±0.1	17.22±0.21	8.48±0.15
1.5Ag/2Cap	7.76±0.11	19.44±0.12	9.36±0.06
2Ag/Cap	11.48±0.12	20.61±0.14	10.3±0.24

Fig. S2: the EDS results of various coatings with different Ag/CaP concentration and corresponding mass fraction

Reference

[1] F. Schwarz, J. Derks, A. Monje, H.L. Wang, Peri-implantitis, J Periodontol 89 Suppl 1 (2018) S267-S290.

[2] J. Neilands, C. Wickstrom, B. Kinnby, J.R. Davies, J. Hall, B. Friberg, G. Svensater, Bacterial profiles and proteolytic activity in peri-implantitis versus healthy sites, Anaerobe 35(Pt A) (2015) 28-34.

[3] Y. Huang, J. Zeng, G. Chen, X. Xie, W. Guo, W. Tian, Periodontitis contributes to adipose tissue inflammation through the NF-<kappa>B, JNK and ERK pathways to promote insulin resistance in a rat model, Microbes Infect 18(12) (2016) 804-812.