



Supporting Information

Bio-inspired peptide decorated dendrimer for a robust antibacterial coating on hydroxyapatite

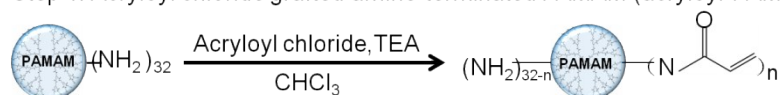
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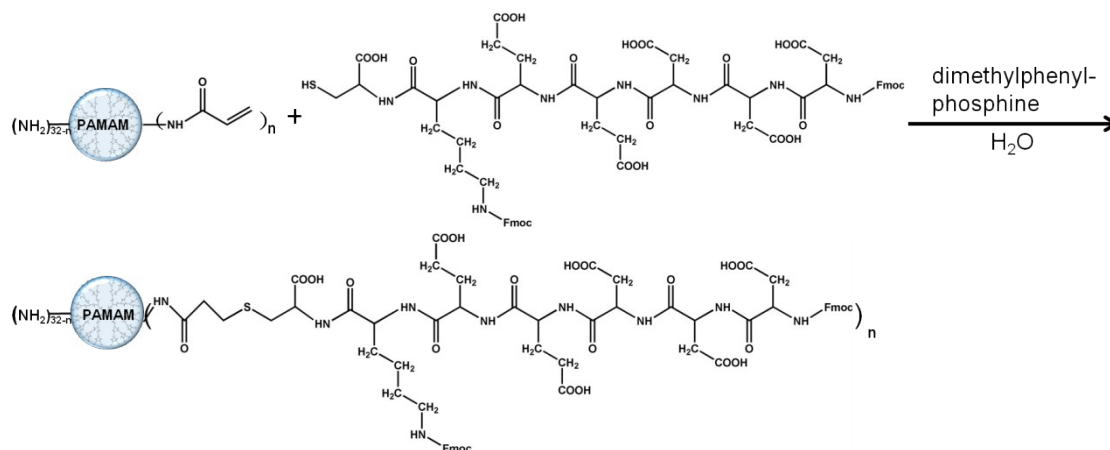
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Step 1: Acryloyl chloride grafted amine-terminated PAMAM (acryloyl-PAMAM-NH₂)



Step 2: Fmoc protected DDDEKC conjugate with the acryloyl-PAMAM-NH₂



Step 3: Deprotection reaction

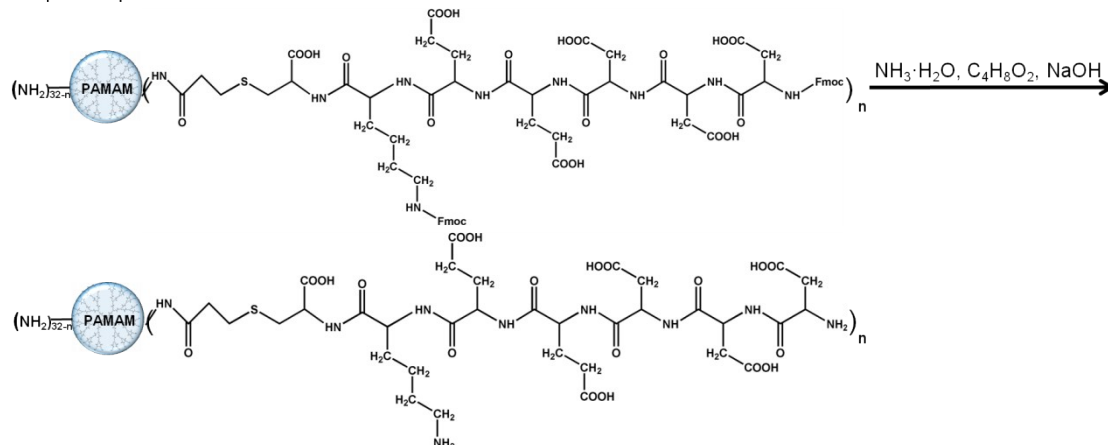


Figure S1. Schematic illustration of the synthesis of bioinspired SSP-PAMAM-NH₂ dendrimer.

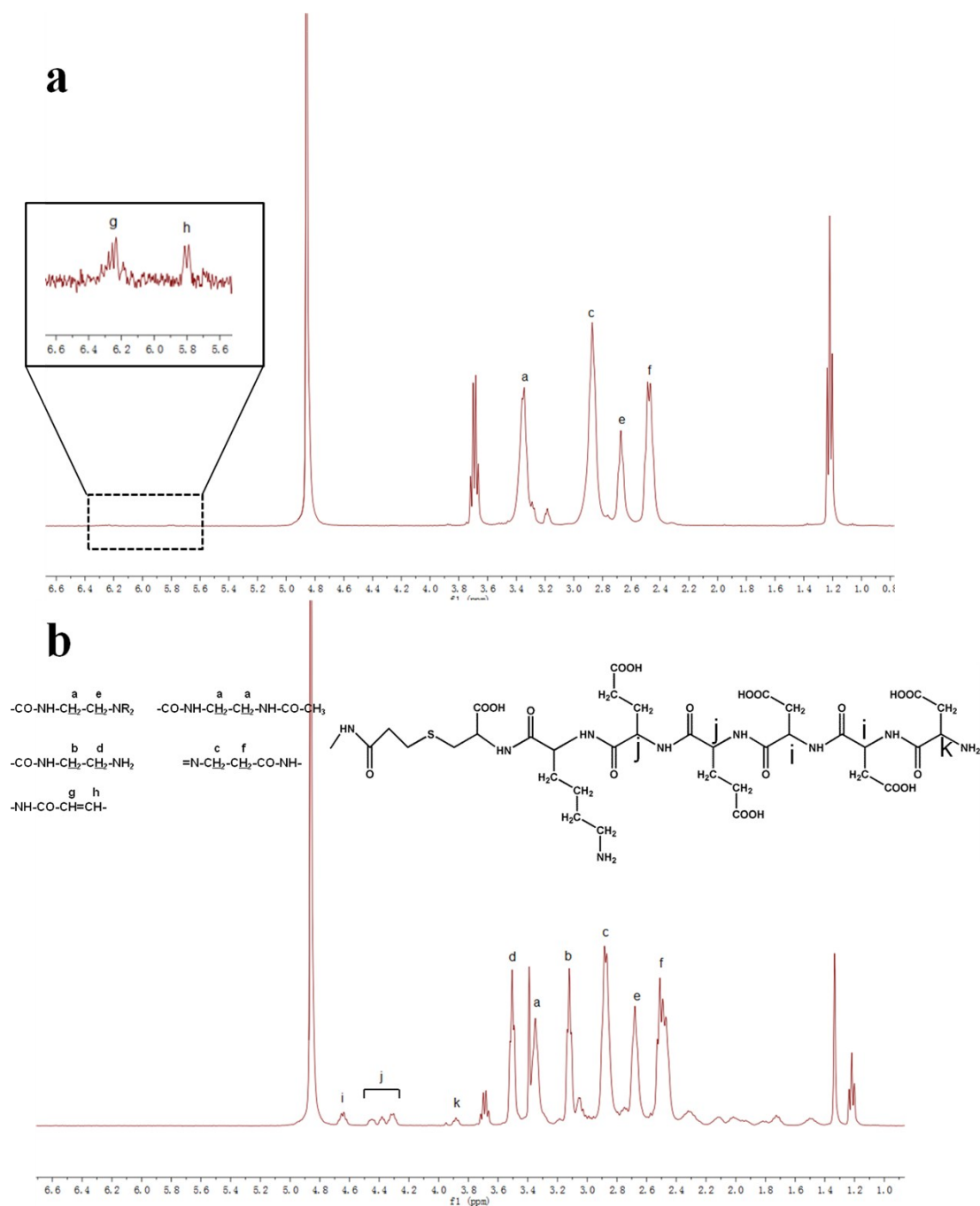


Figure S2. ^1H NMR of acryloyl-PAMAM-NH₂ (a) and SSP-PAMAM-NH₂ (b).

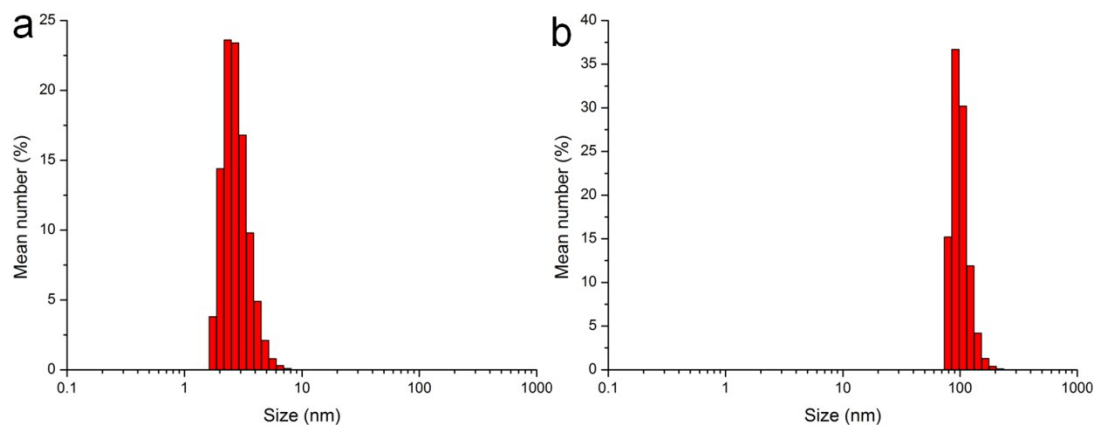


Figure S3. DLS data of (a) PAMAM-NH₂ and (b) SSP-PAMAM-NH₂ in solution.

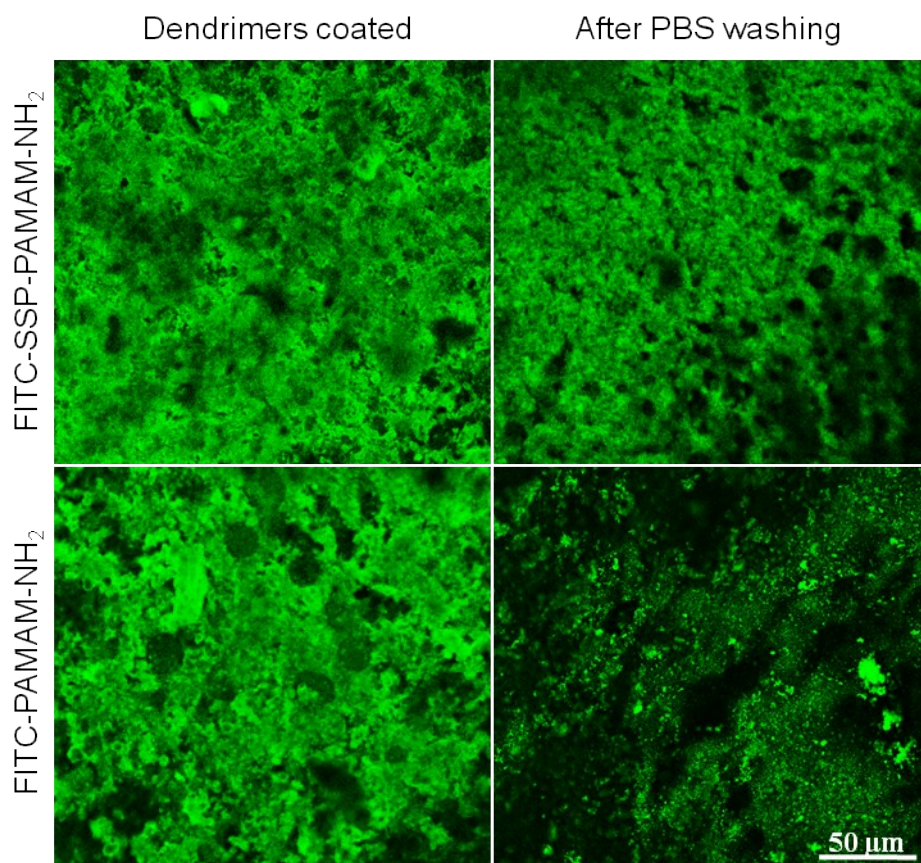


Figure S4. CLSM of HA disks coated with dendrimers, and the sample after PBS washing.

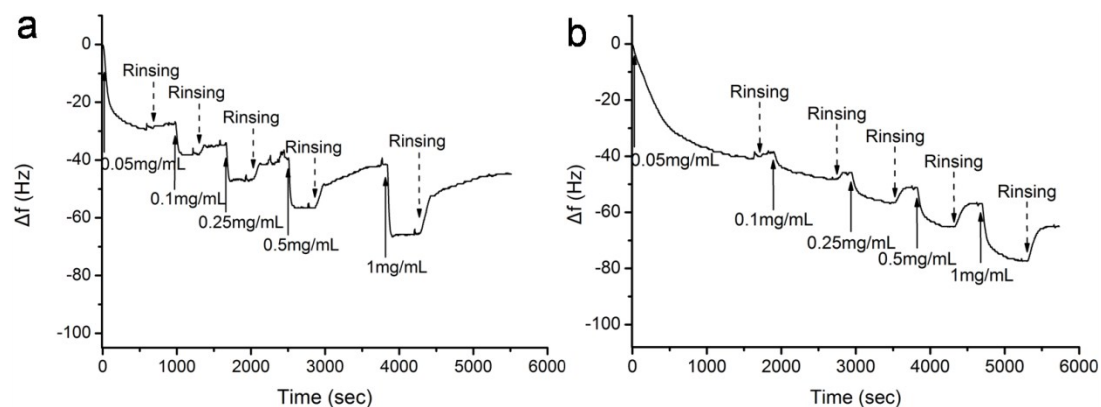


Figure S5. QCM-D results of the dendrimer adsorption behaviours on the surface of HA-coated quartz chips. Representative Δf curves of (a) PAMAM-NH₂ and (b) SSP-PAMAM-NH₂ at different concentrations.

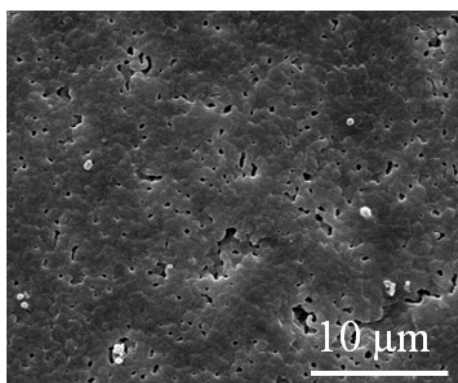


Figure S6. SEM image of the bare HA disk.

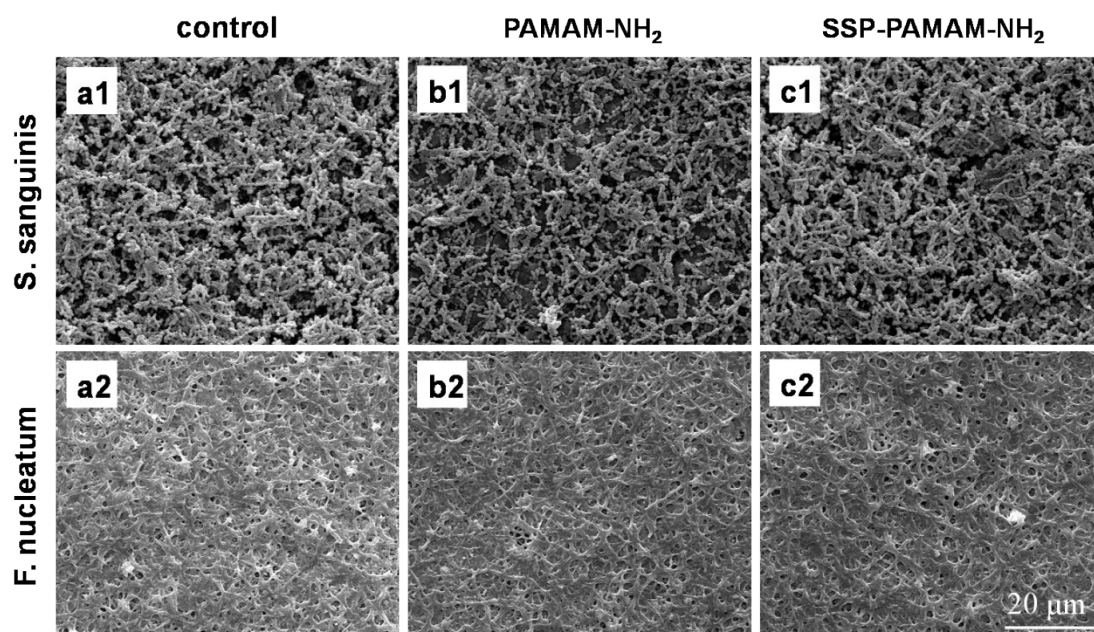


Figure S7. SEM images of typical biofilms of *S. sanguinis* (a1, b1 and c1) and *F. nucleatum* (a2, b2 and c2) on the surface of HA without treatment (a group, control), coated with PAMAM-NH₂ (b group) and SSP-PAMAM-NH₂ (c group).

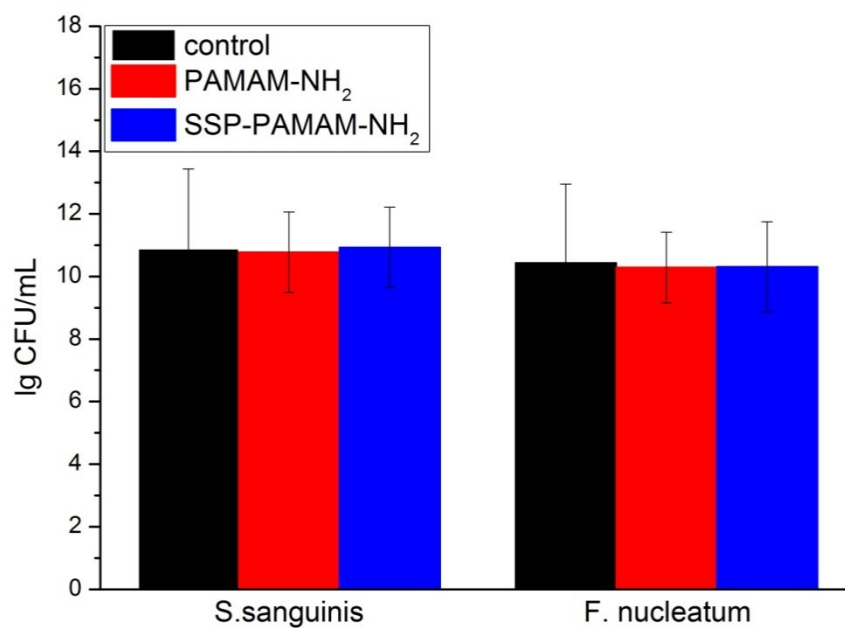


Figure S8. Colony-forming unit counts of biofilms formed on bare HA disk (control), PAMAM-NH₂ coated HA, and SSP-PAMAM-NH₂ coated HA. Data are presented as mean \pm standard deviation.

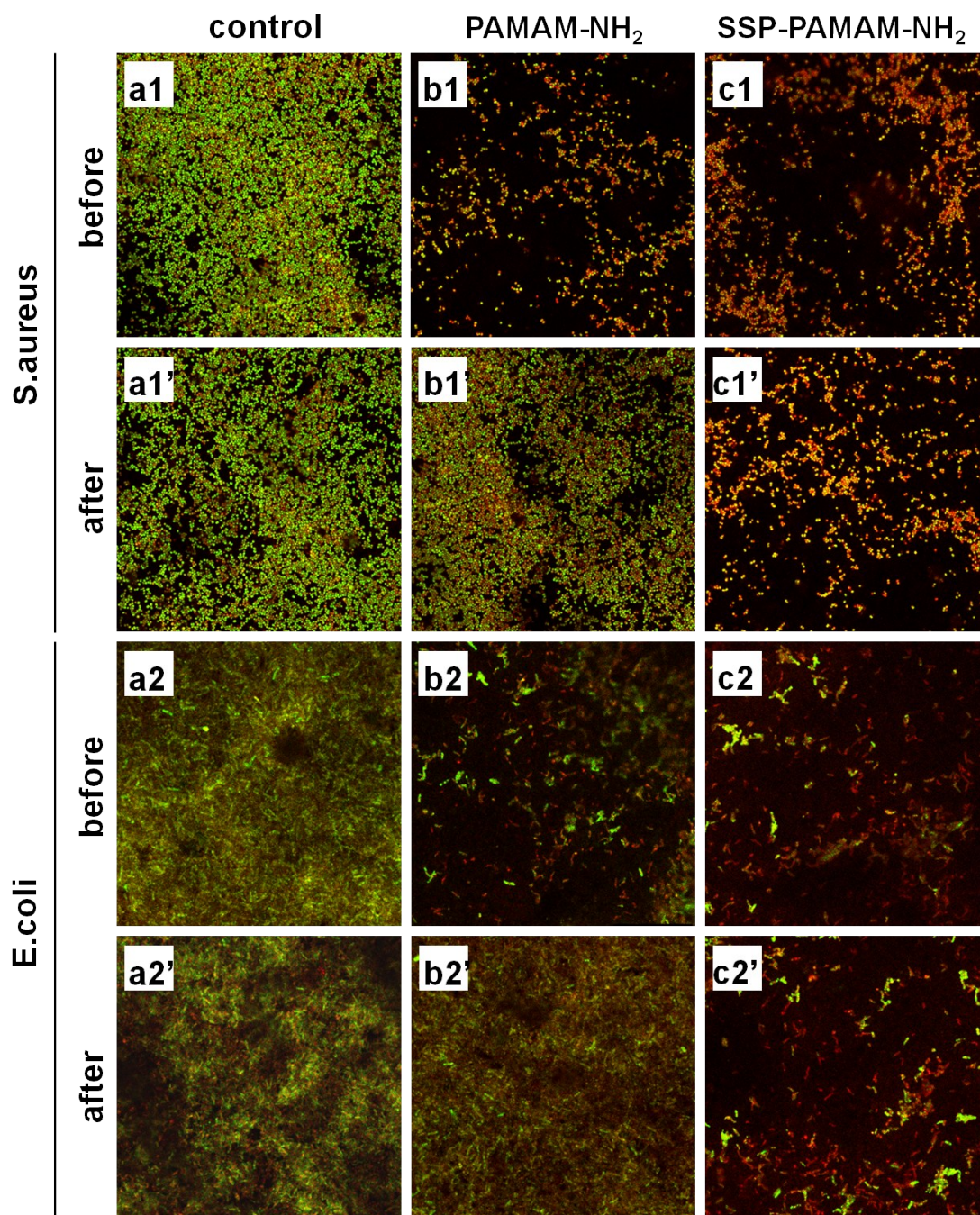


Figure S9. Live/dead bacteria staining of typical biofilms of *S. aureus* and *E. coli* on the surface of HA without treatment/control (a group), coated with PAMAM-NH₂ (b group) and SSP-PAMAM-NH₂ (c group), before (*S. aureus*: a1, b1 and c1; *E. coli*: a2, b2 and c2) and after (*S. aureus*: a1', b1' and c1'; *E. coli*: a2', b2' and c2') being incubated in PBS for 4 weeks. Live bacteria dye green, dead bacteria dye red, adjacent live and dead bacteria are presented as yellow when they are merged.