

Supporting Information

“Mechano-bactericidal anisotropic microparticles for oral biofilm treatment”

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Supplementary figures

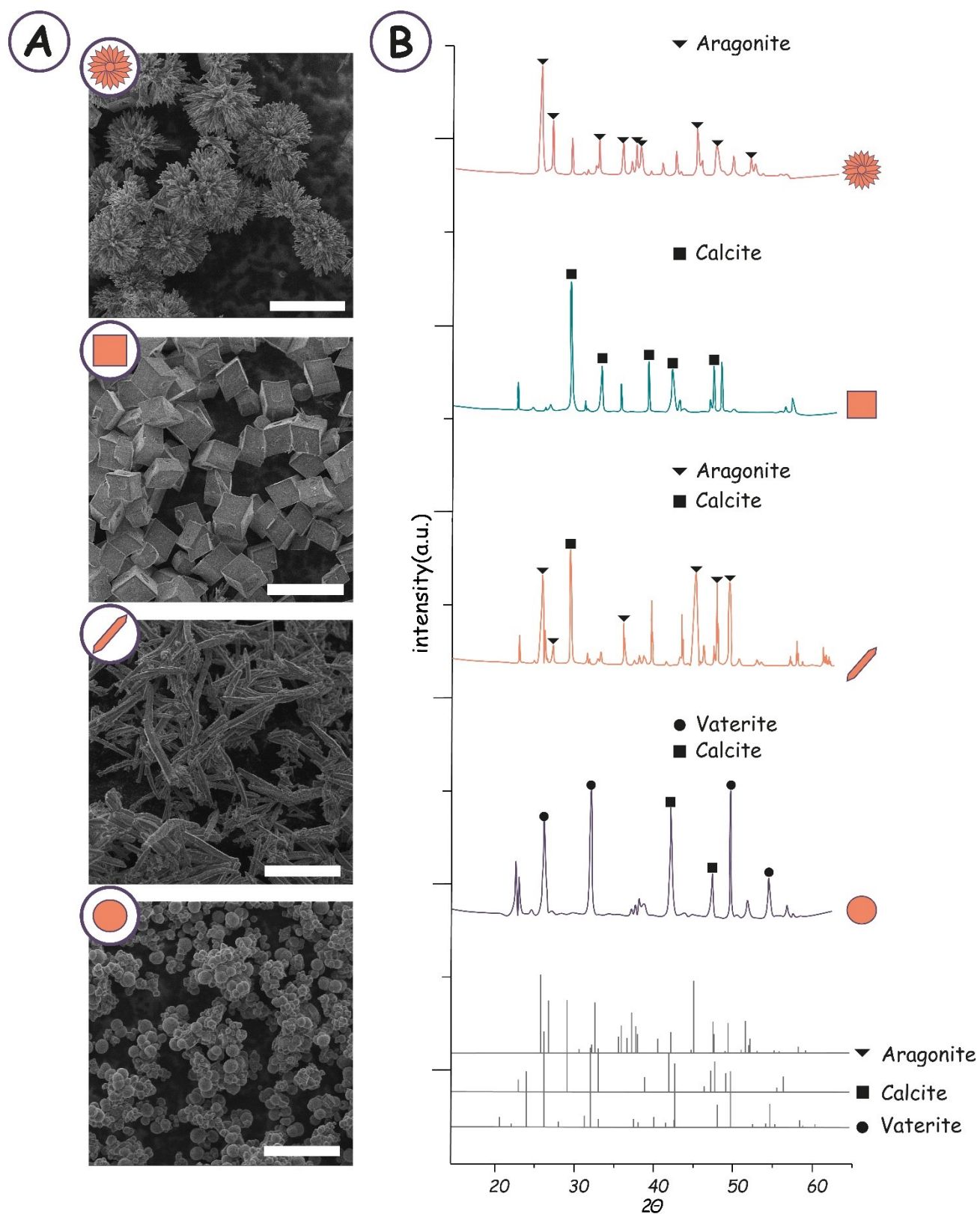


Figure S1. Particles characterization: (A) SEM images and (B) X-ray diffraction patterns.

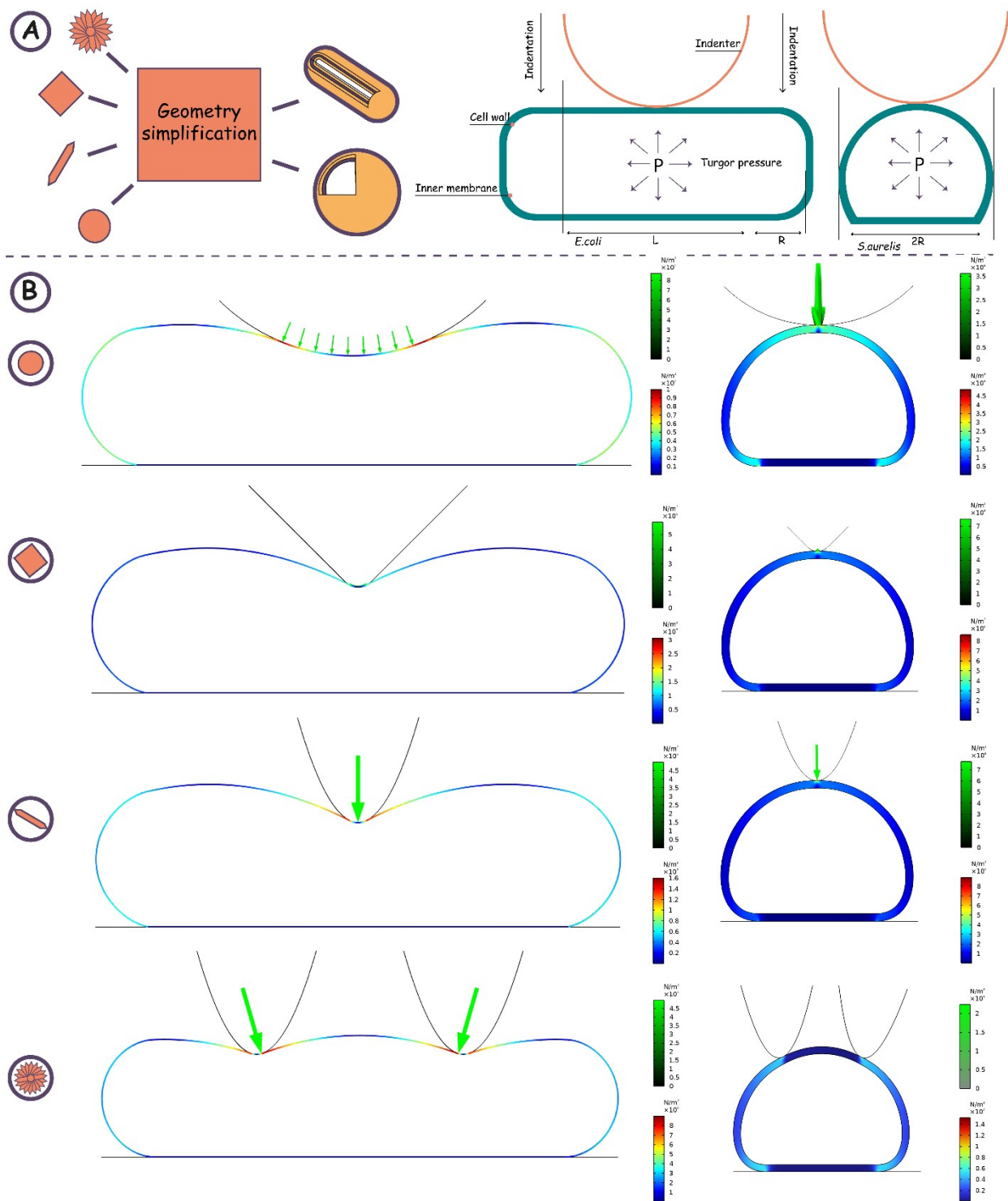


Figure S2. The numerical modeling of bacteria mechanical rupture for shape prediction: (A) Simplification of particle and bacteria geometry, (B) multiphysical modeling of bacteria cell wall after particle indentation, the color bar corresponds for contact pressure (green gradient) and von Mises tensile stress (Pa).

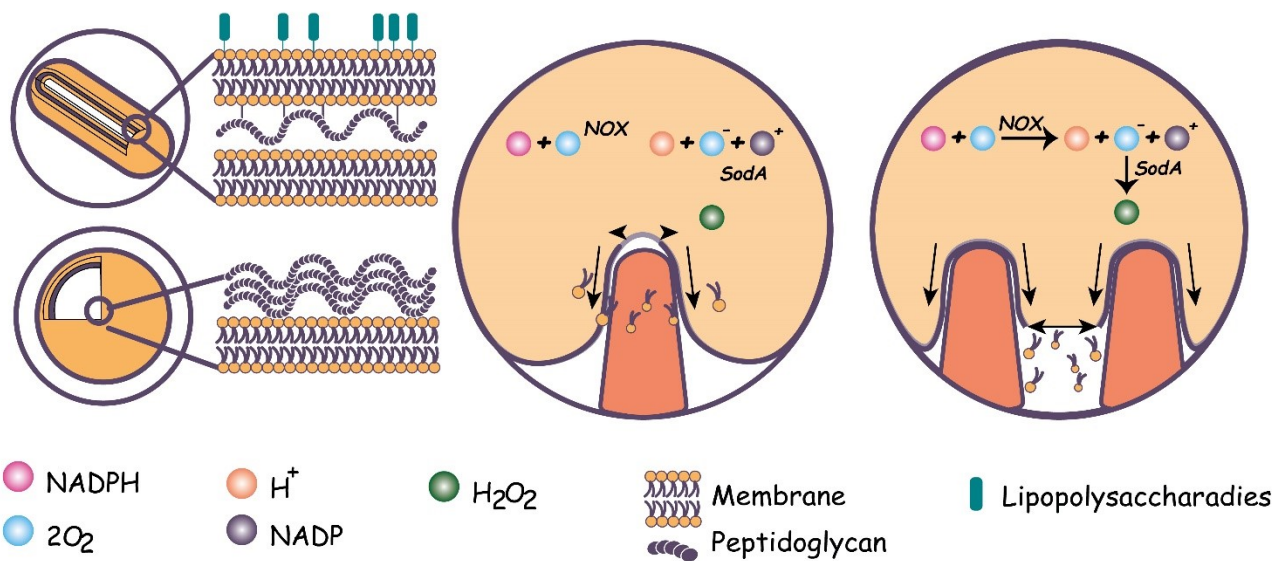


Figure S3. Scheme of a possible mechano-bactericidal mechanism of particles action.

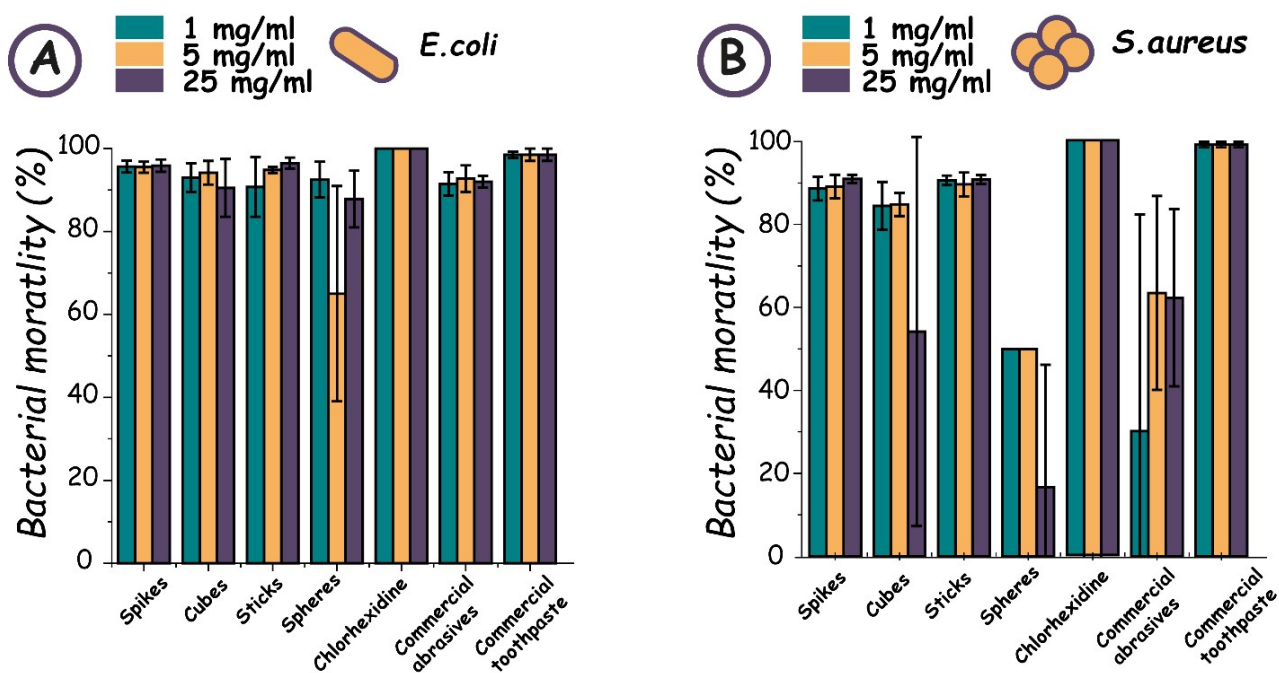


Figure S4. The comparison of the bactericidal activity of designed anisotropic particle with chlorhexidine, commercial abrasives, and commercial toothpaste actions: (A) CFU counts for *E. coli* and (B) *S. aureus*.

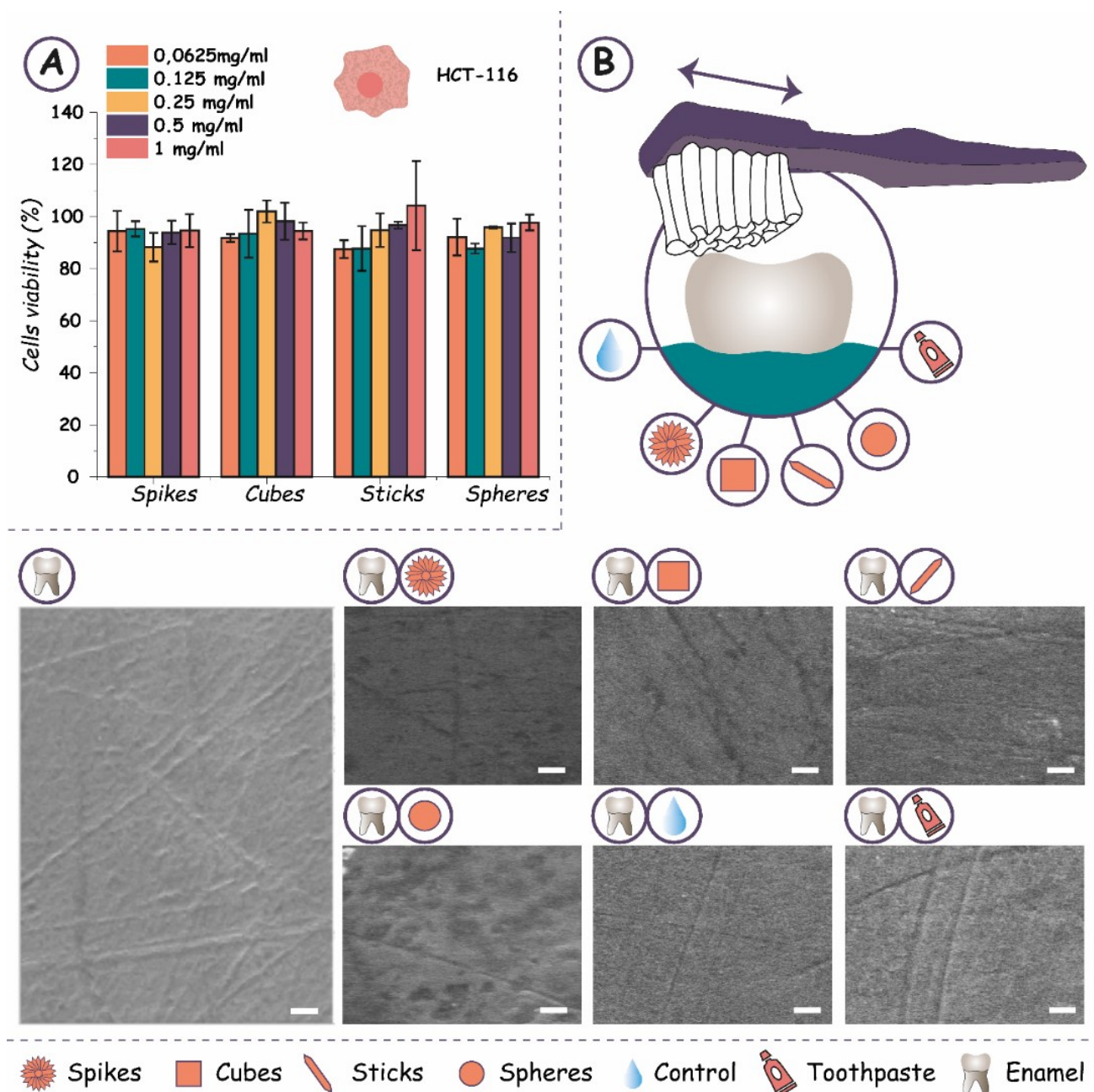


Figure S5. Safety assessment of the developed mechano-bactericidal strategy: (A) Cytotoxicity test on HCT-116 cells, (B) experimental scheme of enamel damage evaluation and SEM images of enamel specimens after cleaning with microparticles, water control, and sediments from a commercial toothpaste. Scale bar is 2.5 μ m.

Supplementary tables

Table 1. Microparticle size data.

Microparticle type	Height	Width	Additional information
Sphere	1.38 μm	1.38 μm	Isotropic form
Cubic	5.25 μm	5.25 μm	Corner orientation
Stick	10.5 μm	0.9 μm	Sharp ending was smoothed
Urchin	4.1 μm	0.2 μm	Spacing between the needles is 0.8 μm