

Supporting Information

Small Synthetic Peptides Bioconjugated to Hybrid Gold Nanoparticles Destroy Potentially Deadly Bacteria in Submicromolar Concentration

Gianna Palmieri^{†°}, Rosarita Tatè[‡], Marta Gogliettino[†], Marco Balestrieri[†], Ilaria Rea[§], Monica Terracciano^{§°}, Yolande Therese Proroga[¶], Federico Capuano[¶], Aniello Anastasio[^] and Luca De Stefano^{§°}*

[†]Institute of Biosciences and BioResources, UOS Na, National Research Council, Via Pietro Castellino 111, 80131 Naples Italy

[‡]Institute of Genetics and Biophysics, National Research Council, Via Pietro Castellino 111, 80131 Naples Italy

[¶]Department of Food Microbiology, Istituto Zooprofilattico Sperimentale del Mezzogiorno, via della Salute, 2, 80055 Portici (NA) Italy;

[§]Institute for Microelectronics and Microsystems, National Research Council, Via Pietro Castellino 111, 80131 Naples Italy;

[°]Materias S.r.l., Corso N. Protopisani n. 50, 80146 Naples, Italy

[^]Department of Veterinary Medicine and Animal Production, University of Naples Federico II, Via Federico Delpino 1, 80137 Naples Italy.

Correspondent author: Dr. L. De Stefano, Email: luca.destefano@cnr.it

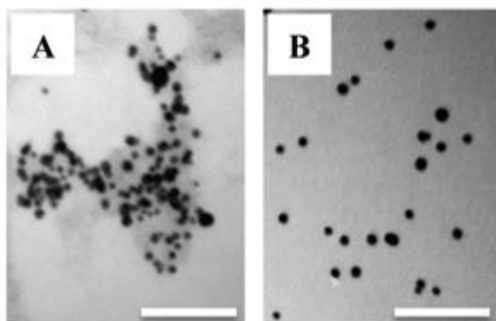


Fig. S1. TEM imaging of 1018K6-AuNPs stained with (A) or without (B) a protein-fixing agent.

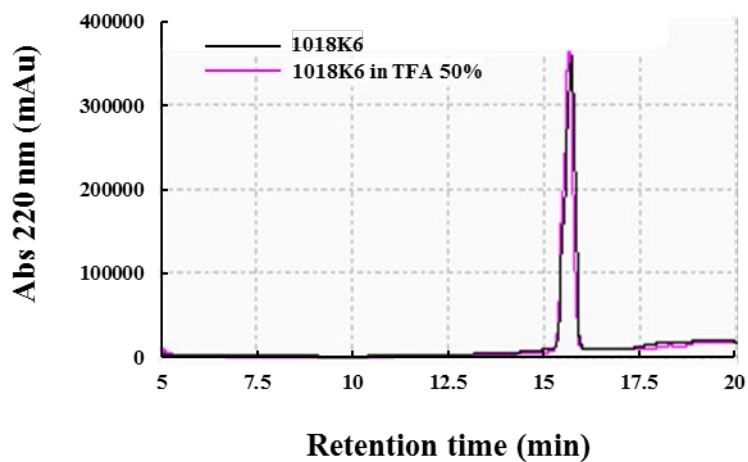


Fig. S2. Reverse-phase HPLC chromatography on C18 column of 1018K6 incubated in TFA 50% for 24 h at room temperature. 1018K6 incubated without TFA in the same experimental conditions, was used as control.

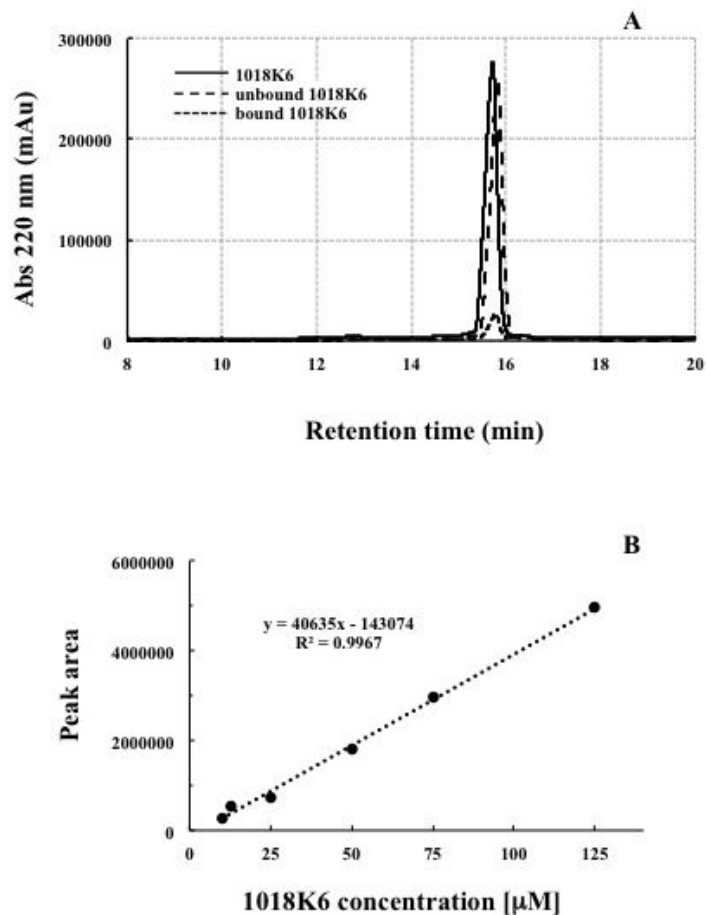


Fig. S3. Reverse-phase HPLC chromatography on a C18 column of 1018K6 free or bound to AuNPs (A). Calibration curve of C18 column obtained using different 1018K6 concentrations (B).

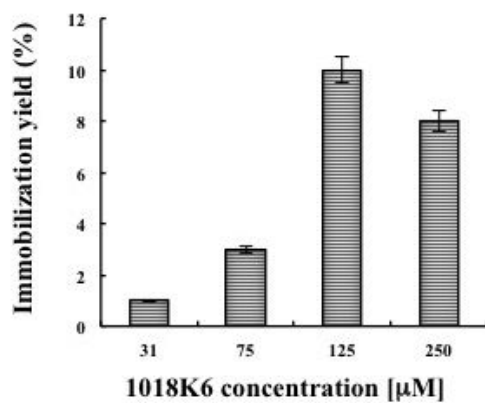


Fig.S4. Immobilization yield (%) of 1018K6 on AuNPs surface as function of peptide concentration.

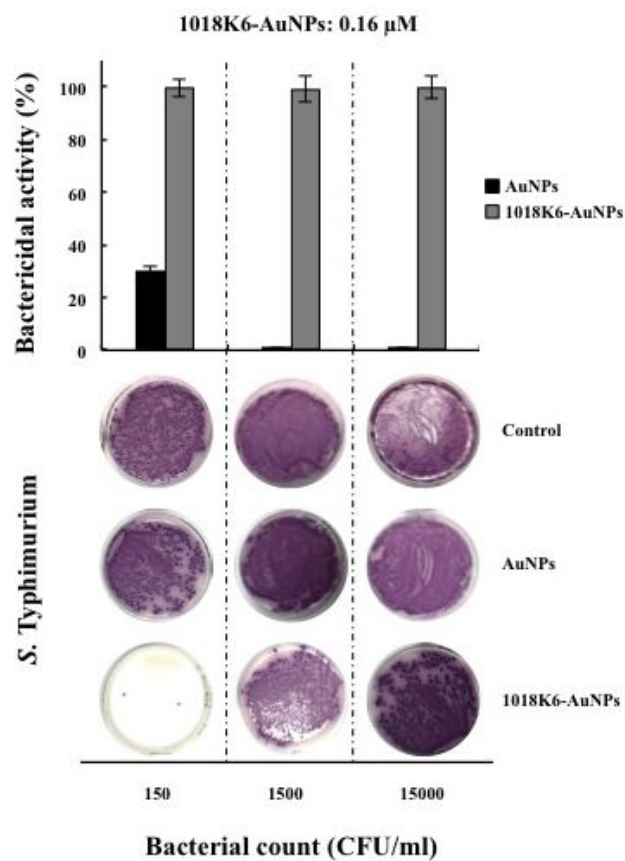


Fig. S5. Bactericidal activity of 1018K6-AuNPs against *S. Typhimurium* using a fixed concentration of the 1018K6-AuNPs (0.16 μ M) and increasing bacterial concentrations (CFU/ml).

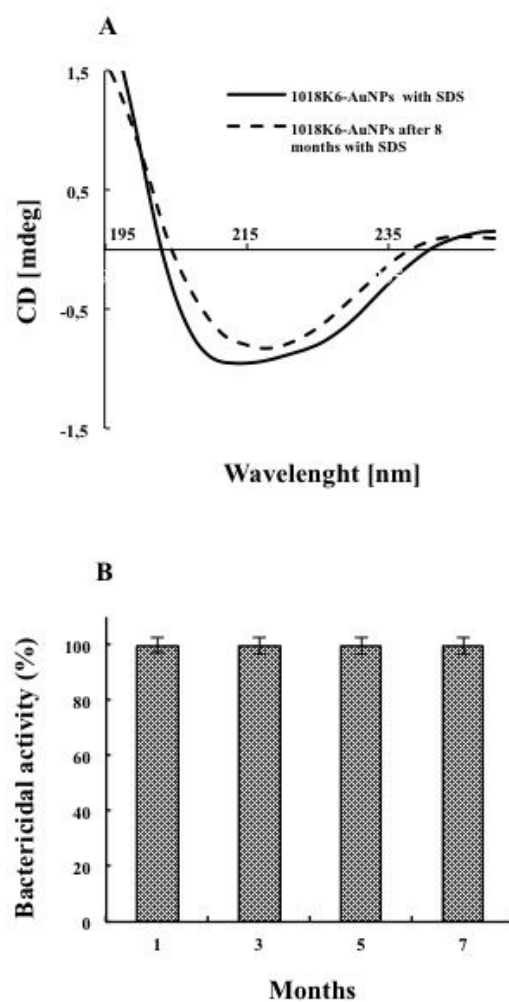


Fig. S6. Long-term conformational stability (A) and bactericidal activity (B) of 1018K6-AuNPs.

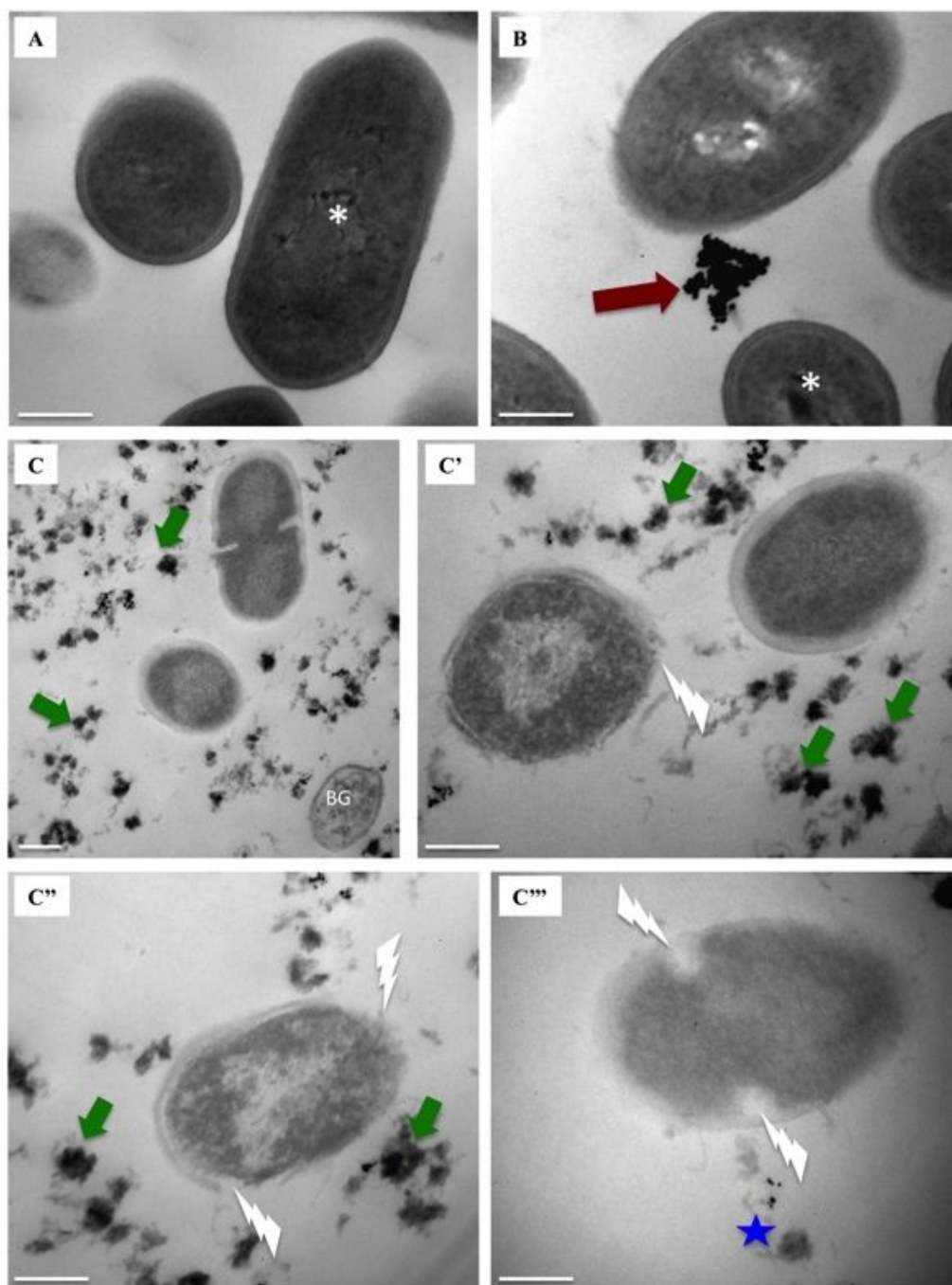


Fig. S7. TEM micrographs of *L. monocytogenes*. Cells untreated (A), treated for 6 h with AuNPs (B) or with 1018K6-AuNPs (C-C'-C''-C''') at 160 nM concentration. Red arrows showed AuNPs located outside of the *Listeria* cells. Green arrows indicate 1018K6-AuNPs mixed with cellular debris. White lightning in C'-C''-C''' clearly demonstrated the destabilization and destructuration of the cell membrane. The bacterial nucleoids were visible only in the untreated

and treated cells with AuNPs *Listeria* cells (Asterisk in A and B). The blue star points out that DNA exit from the cell occurs. The bar was equal to 200 nm.