

Supporting Information

Plasma Deposited Nanocapsules Containing Coatings for Drug Delivery Applications

Fabio Palumbo^{a*}, Annalisa Treglia^b, Chiara Lo Porto^b, Francesco Fracassi^{a,b}, Federico Baruzzi^c, Gilles Frache^d, Dana El Assad^d, Bianca Rita Pistillo^d, Pietro Favia^{a,e*}

- a. Institute of Nanotechnology, National Research Council of Italy, c/o Department of Chemistry, University of Bari “Aldo Moro”, Via Orabona 4, 70126 Bari, Italy
- b. Department of Chemistry, University of Bari “Aldo Moro”, Via Orabona 4, 70126 Bari, Italy,
- c. Institute of Sciences of Food Production, National Research Council of Italy, Via Amendola, 122/O, 70126 Bari, Italy
- d. Material Research & Technology Department, Luxembourg Institute of Science and Technology, 41, rue du Brill, L-4422 Belvaux, Luxembourg
- e. Department of Biosciences, Biotechnologies and Biopharmaceutics, University of Bari “Aldo Moro”, Via Orabona 4, 70126 Bari, Italy

Fabio Palumbo and Annalisa Treglia equally contributed to this work

Contact Authors:

Pietro Favia, Department of Biosciences, Biotechnologies and Biopharmaceutics, University of Bari “Aldo Moro”, Via Orabona 4, 70126 Bari, Italy, Email: pietro.favia@uniba.it

Fabio Palumbo, Institute of Nanotechnology, National Research Council of Italy, c/o Department of Chemistry, University of Bari “Aldo Moro,” Via Orabona 4, Bari 70126, Italy. Email: fabio.palumbo@cnr.it

Gentamicin Structure

The structural formula of the four congeners of Gentamicin and their fragmentation pattern used in this work are represented in Fig. S1. The congeners C₂ and C_{2a} are enantiomers and have the same fragmentation pattern. The common sub-structures are identified as *a*, *b* and *ab*, and the specific sub-structure are identified as *c* and *bc* for each congener³⁶.

Fig S4 reports the mass spectra (*m/z* 420-500) of the water extracted from coatings deposited in pulsed mode and continuous mode.

In Fig. S5 and S6 the AP-MALDI-HRMS spectra are reported for the CM and PM deposited coatings. In particular, Fig. S6 is obtained after subtraction of the gentamicin spectrum, to highlight fragments potentially formed as a consequence of the interaction of plasma drug molecule.

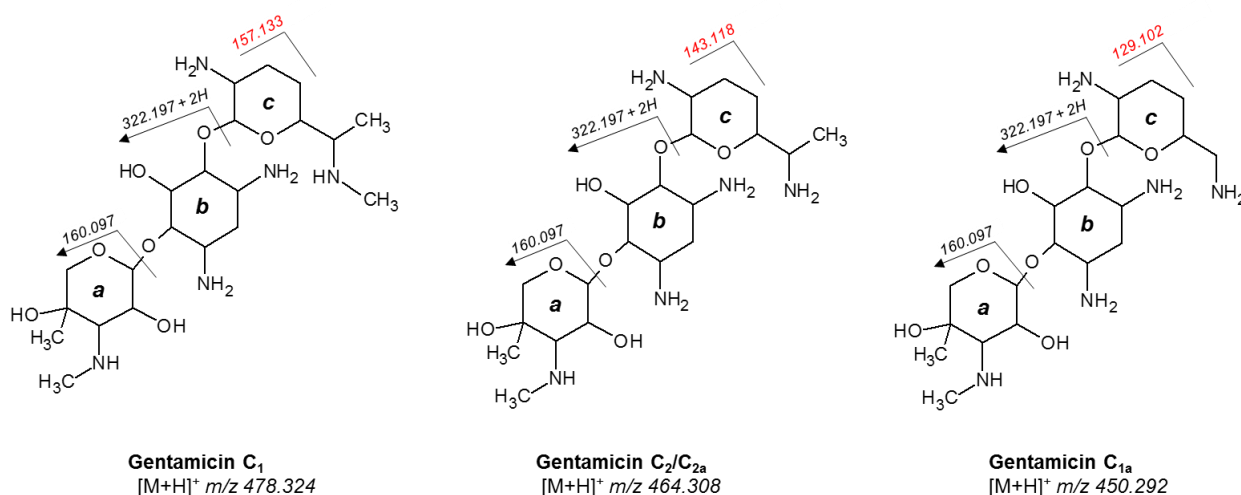


Figure S1. Structural formula of the congeners of gentamicin, with the indication of the *m/z* value of the protonated form, and identification of the sub-unit domains (*a*, *b*, *c*).

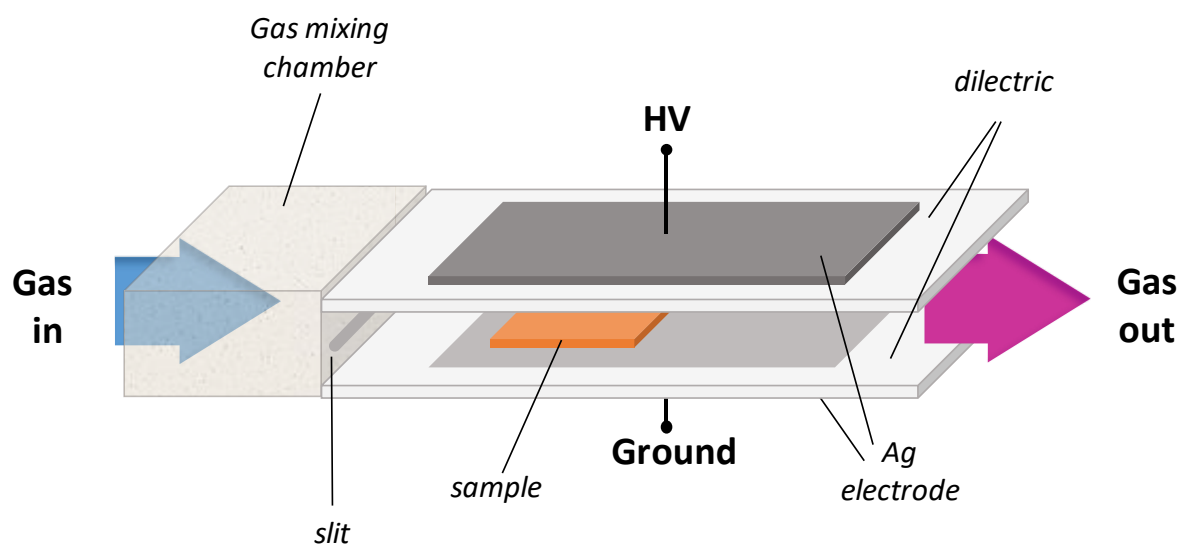


Figure S2. Scheme of the DBD electrode assembly

Atomic Force Microscopy.

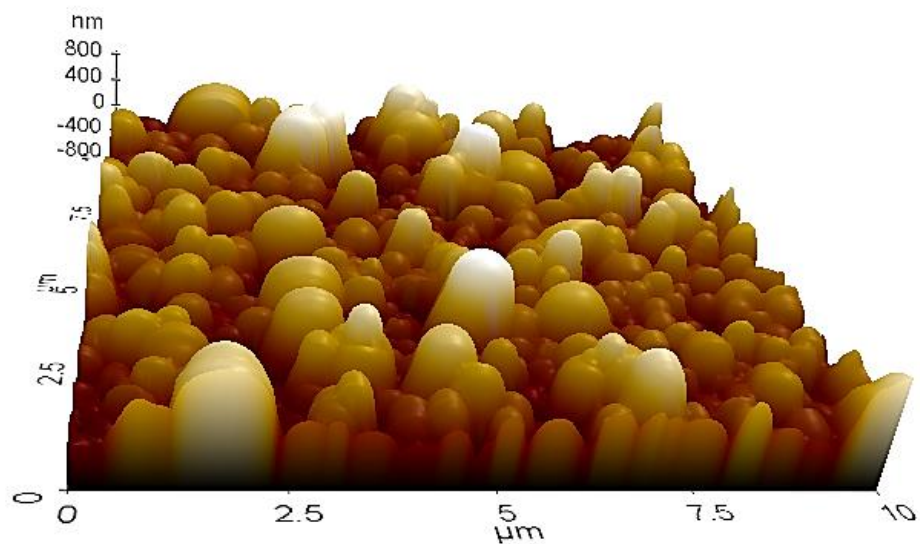


Figure S3a. AFM 3D image of 20 min APP deposited coating in HP CM mode. Discharges were fed with 5 slm He, 20 sccm ethylene, and 10 mg/ml gentamicin solution.

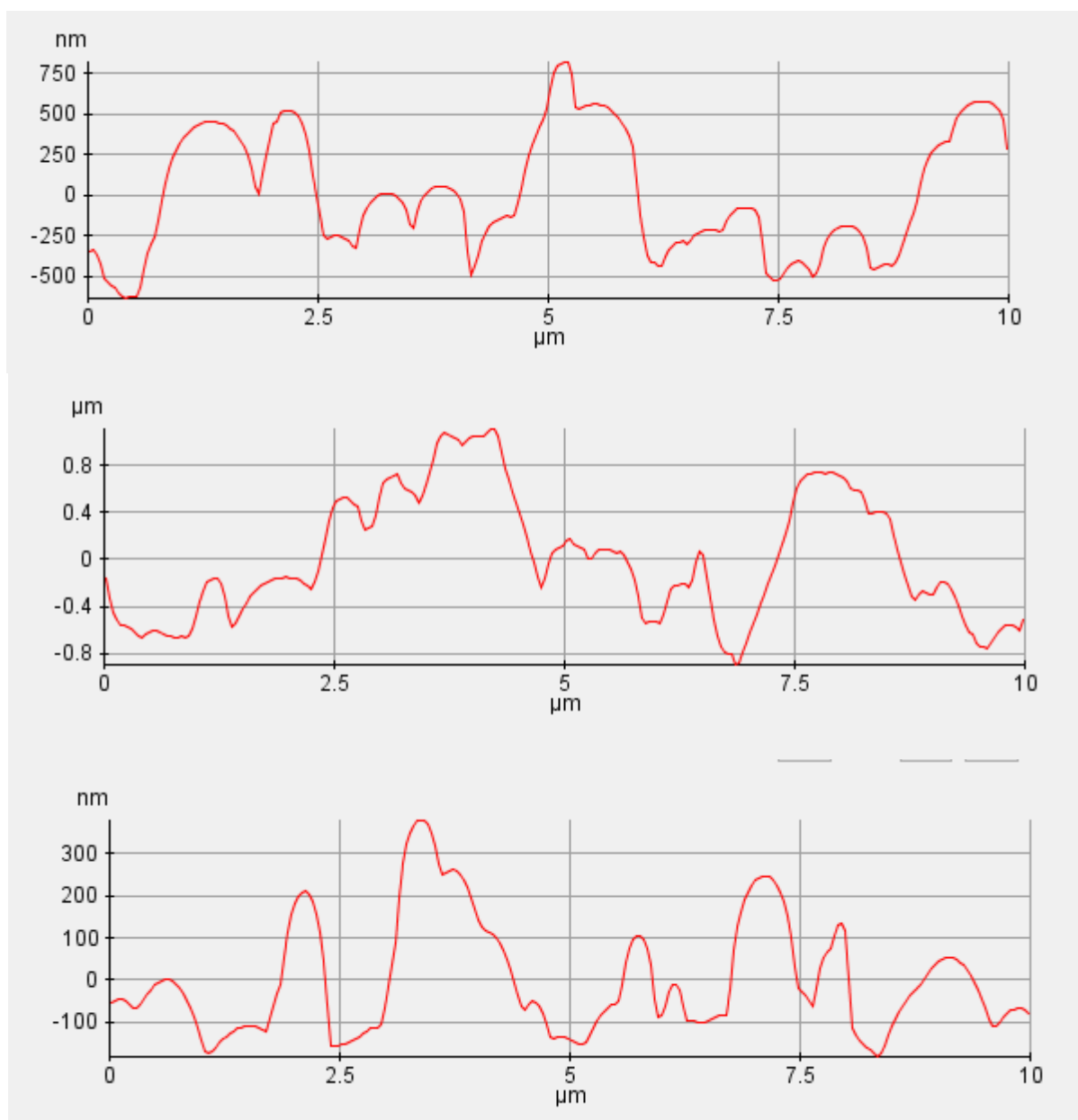


Figure S3b AFM profile of 20 min APP deposited coatings in (top) HP CM mode, (middle) HP PM mode and in (bottom) LP CM mode. Discharges were fed with 5 slm He, 20 sccm ethylene, and 10 mg/ml gentamicin solution

AP-MALDI-HRMS

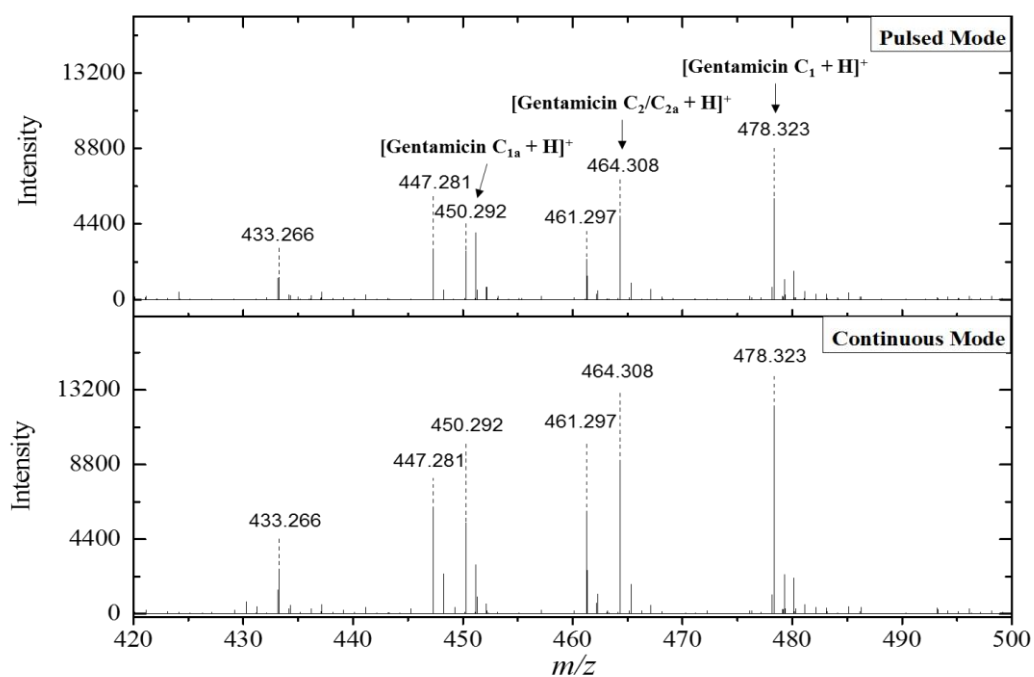


Figure S4. Mass spectra of the water extracted coatings in pulsed mode and continuous mode within the mass range m/z 420-500.

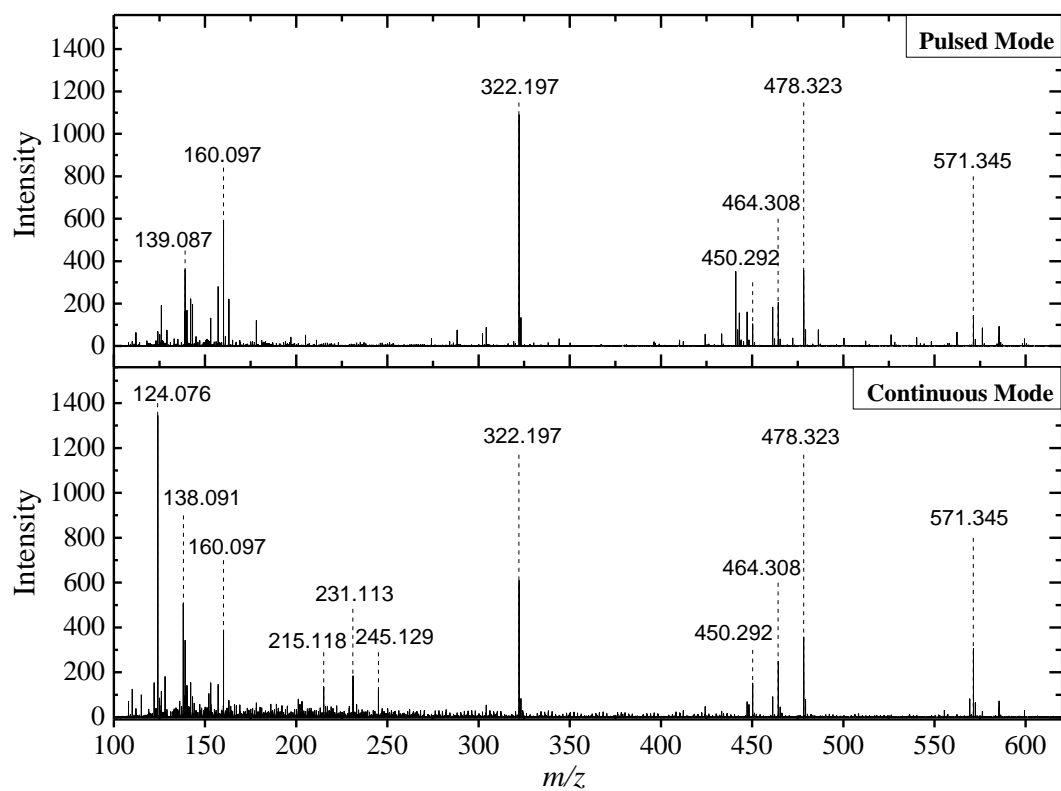


Figure S5. Mass spectra of gentamicin containing coatings deposited in pulsed and continuous mode (20scm of C₂H₄, 5 slm of He in the aerosol solution, at high power). The spectrum of MALDI matrix has been subtracted.

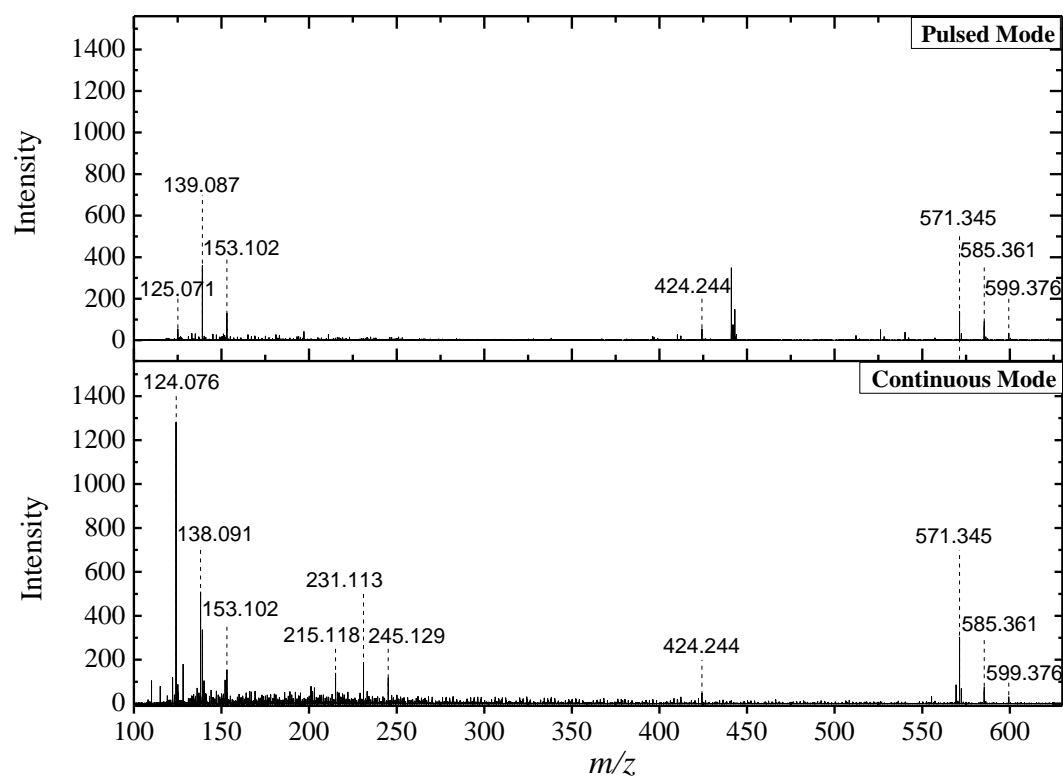


Figure S6. Mass spectra of gentamicin containing coatings deposited in pulsed and continuous mode (20sccm of C_2H_4 , 5 slm of He in the aerosol solution, at high power) after subtraction of gentamicin spectrum and of MALDI matrix.