

Supporting Information

Zn-rich (GaN)_{1-x}(ZnO)_x: a biomedical friend?

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Plant extract preparation

Briefly, the plant, *Salvia hispanica*, was washed with deionized water, and dried at room temperature. The dried plant (about 300 mg) was poured into a mortar and turned into the fine powder and dispersed in DI and heated up to 65 °C for half an hour. Determining the exact concentration of the leaf extract is difficult and because the chemical organic compounds in the leaf extract serve as reducing agents as well as stabilizing agents, the authors feel there is no need to determine the exact concentration of the leaf extract; however, in this study, the amount of the dried leaves extracts was calculated at about 200 mg.

Green synthesis of ZnO NPs

To obtain nanoparticles from the *Salvia hispanica* leaf broth, 40 mL of the plant extract (same as the above-mentioned protocol) was poured into 160 mL of a zinc acetate solution (0.02 M), and the suspension was stirred for 2 hours at room temperature. After that, the pH was adjusted to 12 using NaOH (0.02 M) and stirred for about 1.5 hours until a solid yellow powder was obtained. The color of the final product was white, which was obtained after washing with deionized water and drying overnight at 65 °C.

Drug loading calculations

The loaded drug was calculated using UV-Visible spectroscopy at 480 nm; and the payload of the drug was calculated followed by the below equation:

$$\text{Loading of the drug: } [W_{(\text{total DOX})} - W_{(\text{DOX in supernatant})}] / [W_{(\text{nanocomposite})}] \times 100$$

Cellular uptake

The DOX cellular uptake was investigated by confocal laser scanning microscopy (CLSM, Leica, Germany). In this regard, HeLa cells were seeded in a 96 well plate with the density of 2×10^5 cells per well, and incubated for over 24 hours. The final medium was replaced with the free drug (DOX), nanocomposite-DOX, nanocomposite-DOX-Chitosan and the nanocomposite-DOX-Alginate, in this manner, the concentration of DOX was maintained at $7.6 \mu\text{g mL}^{-1}$. The resulted suspensions were incubated for 4 hours, and before treatment with DAPI for 15 minutes, the cells were washed for several times and fixed with paraformaldehyde (4%).

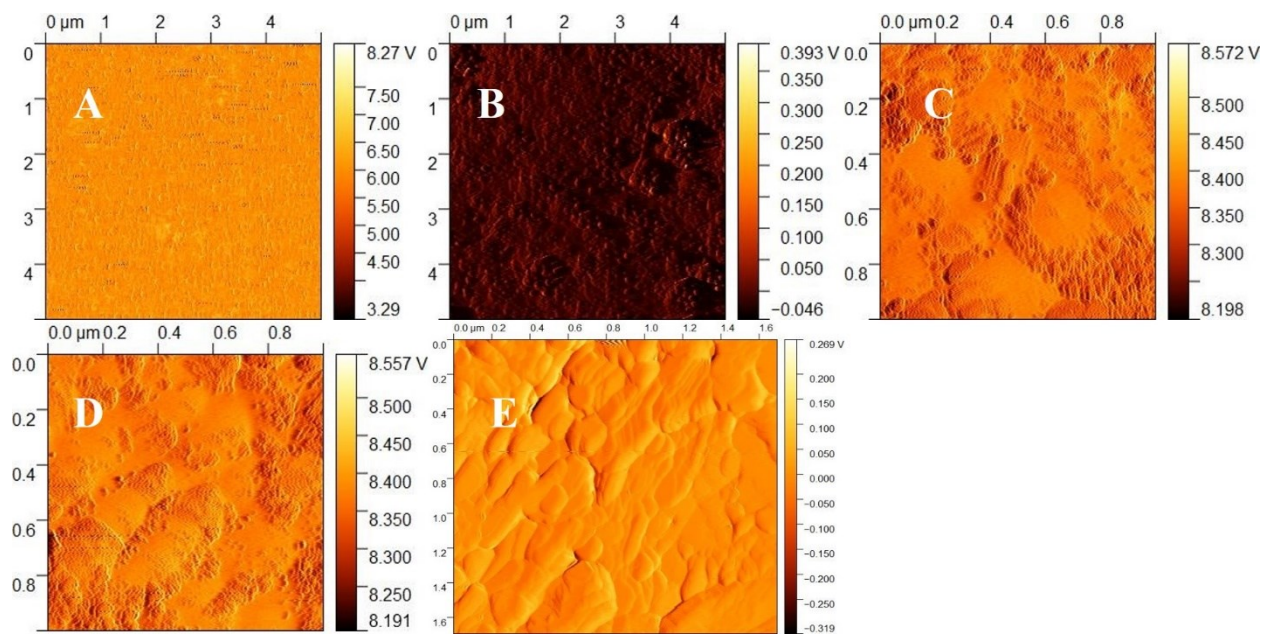


Figure S1. AFM images of the (a) green synthesized ZnO nanoparticles, (b) $(\text{GaN})_{1-x}(\text{ZnO})_x$, (c) $(\text{GaN})_{1-x}(\text{ZnO})_x$ -DOX and (d) $(\text{GaN})_{1-x}(\text{ZnO})_x$ -DOX-alginate and (e) $(\text{GaN})_{1-x}(\text{ZnO})_x$ -DOX-chitosan.