Supporting Information

The interplay between oxidation process and cytotoxicity effects of antimonene nanomaterials

Pau Congost-Escoin,[a] Matteo Andrea Lucherelli,[a] Víctor Oestreicher,[a] Guillermo García-Lainez,[b] Marta Alcaraz,[a] Martín Mizrahi,[c,d] Maria Varela,[e] Inmaculada Andreu*[f,g] and Gonzalo Abellán*[a]

[a] Instituto de Ciencia Molecular (ICMol), Universitat de València. Catedrático José Beltrán Martínez nº 2, 46980 Paterna, Spain.

[b] Instituto de Investigación Sanitaria (IIS) La Fe, Hospital Universitari i Politècnic La Fe, Avenida de Fernando Abril Martorell 106, 46026, Valencia, Spain.

[c] Instituto de Investigaciones Fisicoquímicas Técnicas y Aplicadas (INIFTA), Departamento de Química, Facultad de Ciencias Exactas. Universidad Nacional de La Plata, CCT La Plata-CONICET. Diagonal 113 y 64, 1900, La Plata, Argentina.

[d] Facultad de Ingeniería, Universidad Nacional de La Plata. Calle 1 esq. 47, 1900, La Plata, Argentina.d. [e] Instituto Pluridisciplinar & Departamento de Física de Materiales, Universidad Complutense de Madrid (UCM), 28040 Madrid, Spain.

[f] Departamento de Química. Universitat Politècnica de València, Camino de Vera s/n, 46022, Valencia, Spain.

[g] Unidad Mixta de Investigación Universitat Politècnica de València-Instituto de Investigación Sanitaria La Fe, Hospital Universitari i Politècnic La Fe, Avenida de Fernando Abril Martorell 106, 46026, Valencia, Spain.

e-mails: gonzalo.abellan@uv.es , iandreur@qim.upv.es

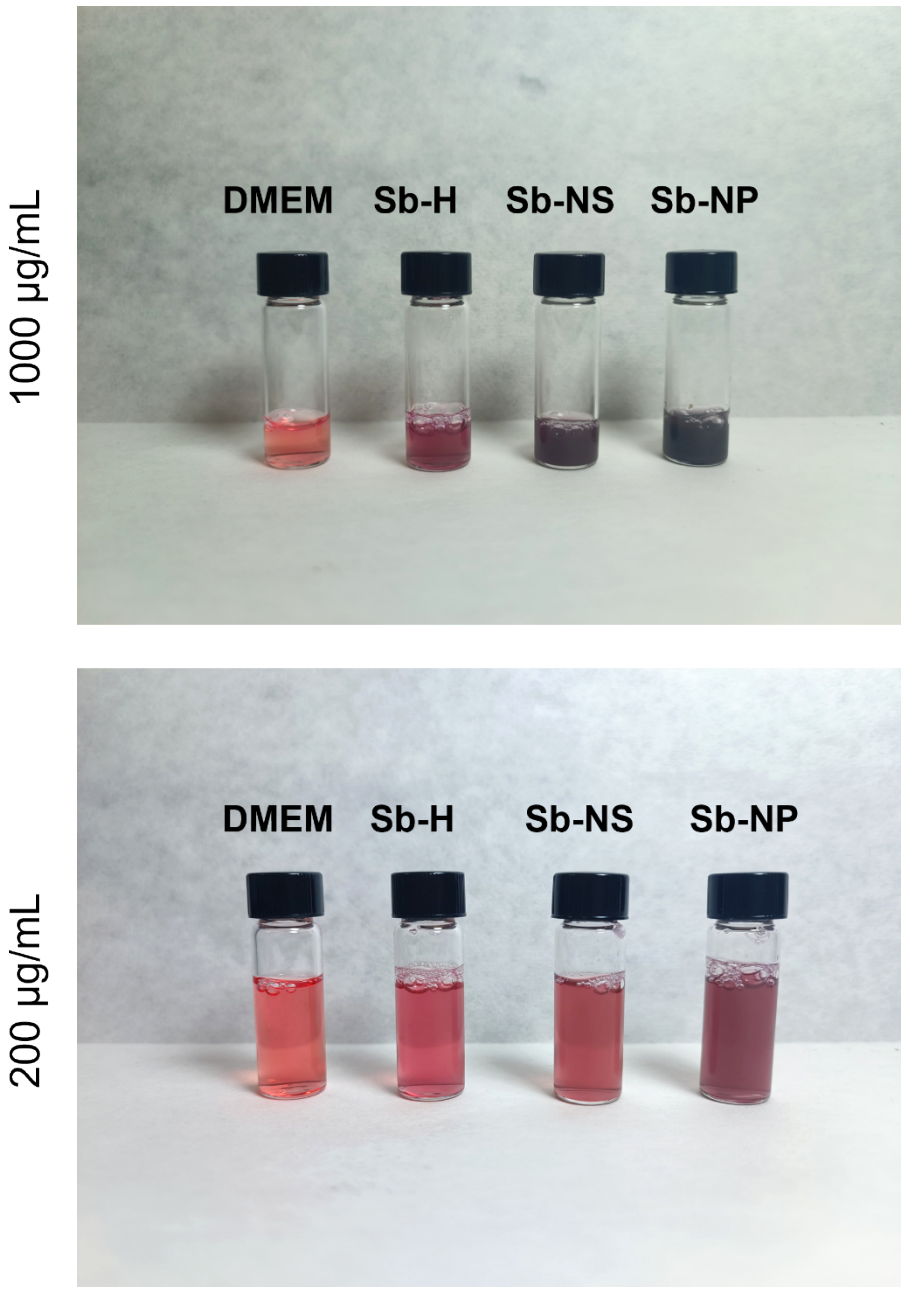

Figure S1: *Photographs of the of the DLS dispersions at 1 mg/ml (resuspended concentration) and at 200 g/ml.*

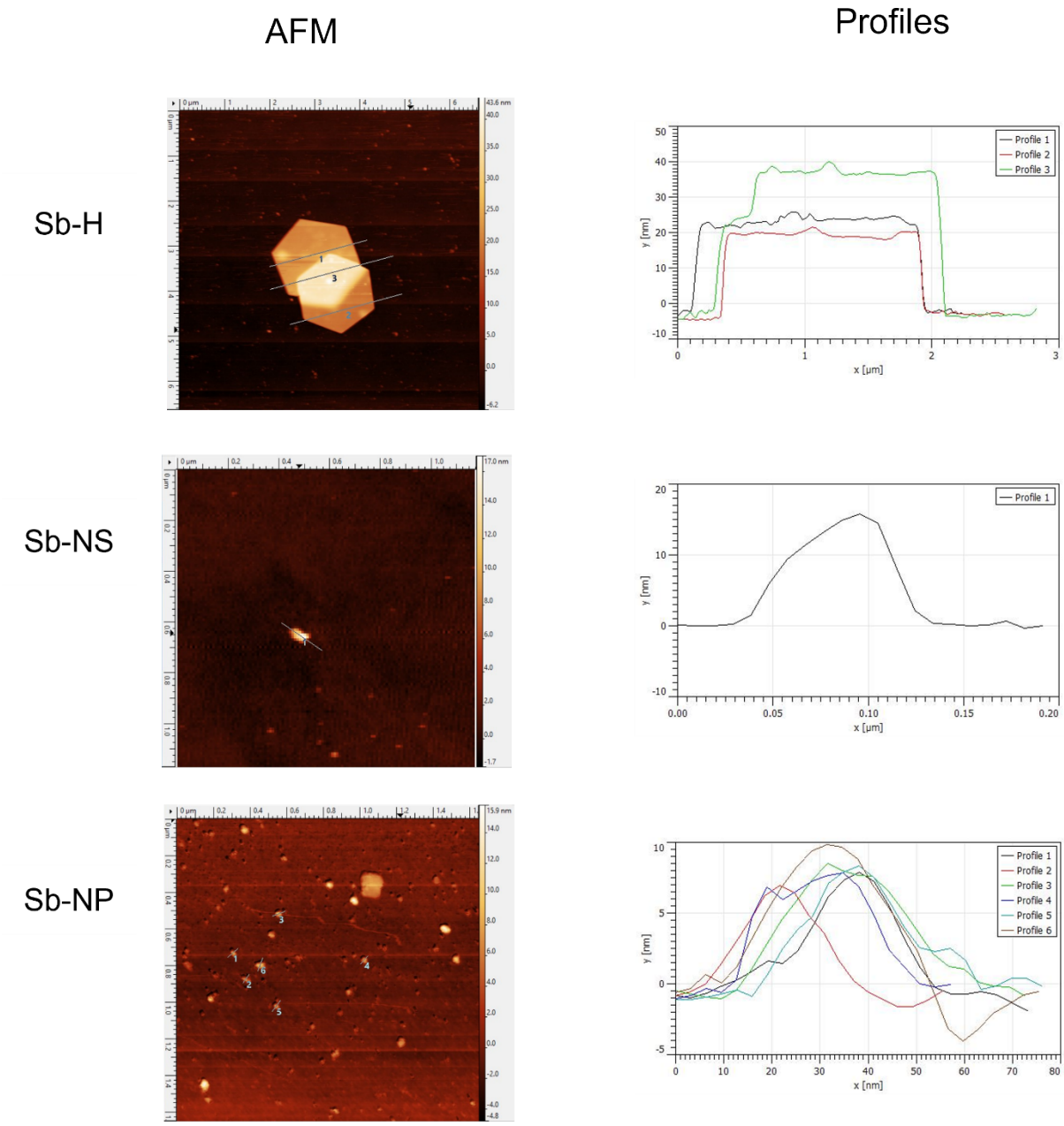

Figure S2: *AFM images of the obtained Sb-Nanomaterials. AFM profiles showed on left correspond to the lines indicated in the images.*

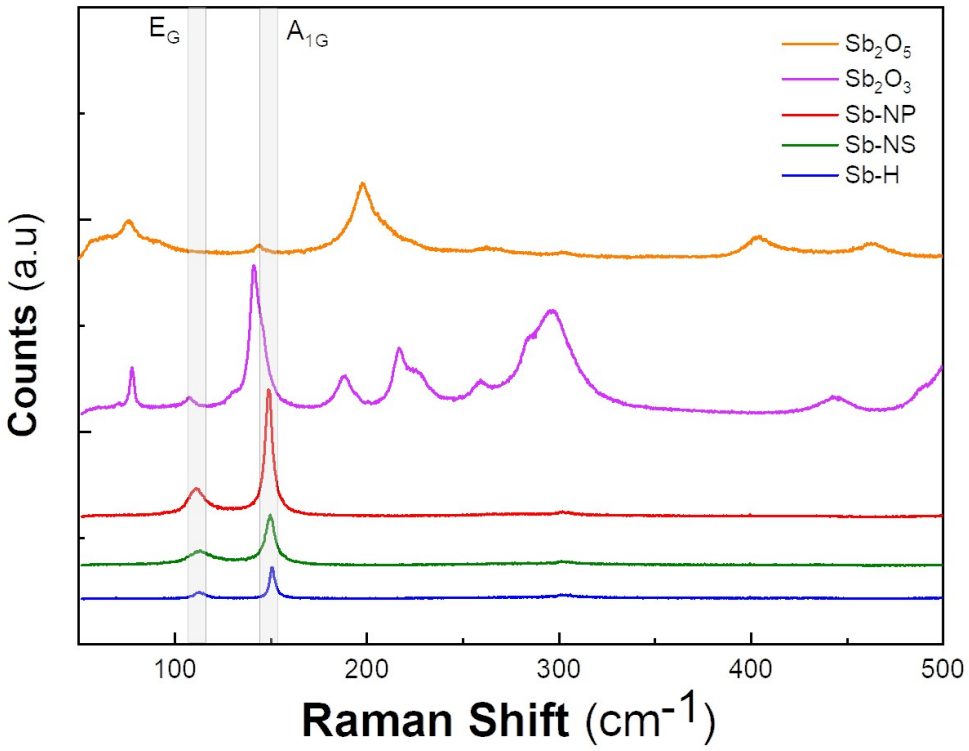

***Figure S3**: Comparison of the Raman spectra of the Sb-nanomaterials and Sb oxides.*

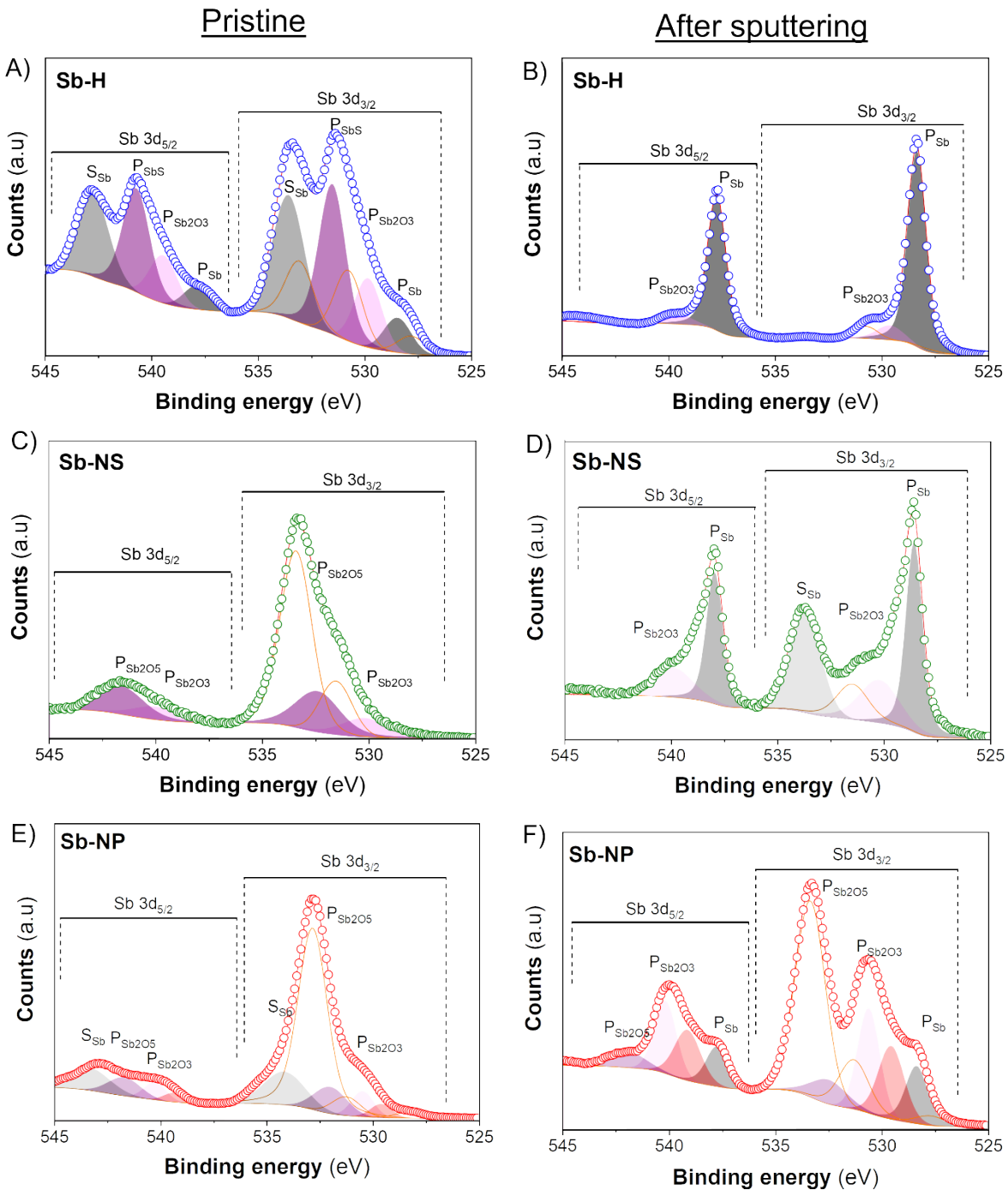

Figure S4: *Deconvoluted XPS spectra of the nanomaterials before A, C, E) and after B, D, F) the sputtering process of the three Sb-Nanomaterials. P indicates the peak of the indicated atom and S the satellite.*

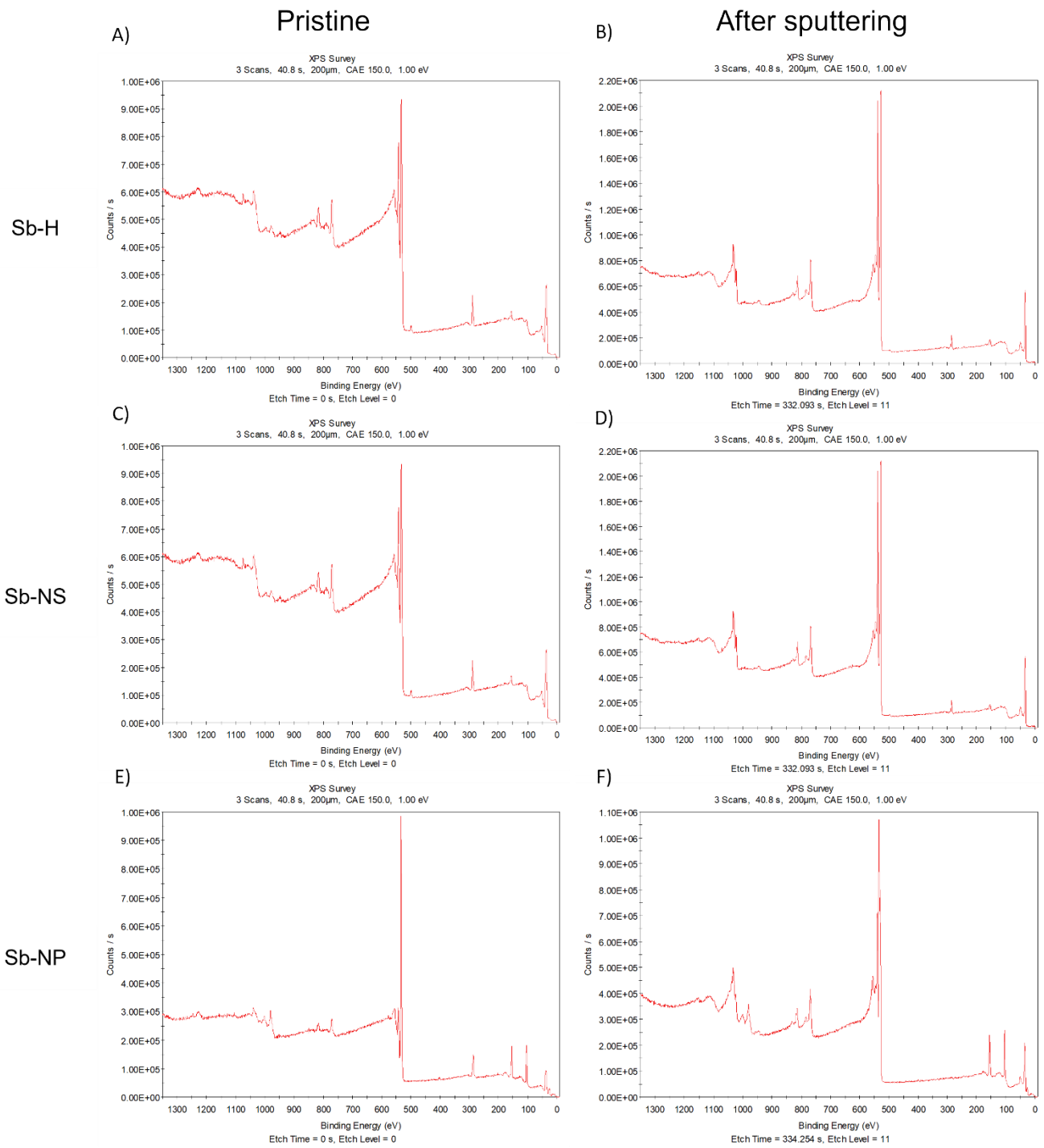

Figure S5: *XPS surveys of the nanomaterials before A, C, E) and after B, D, F) the sputtering process of the three Sb-Nanomaterials.*

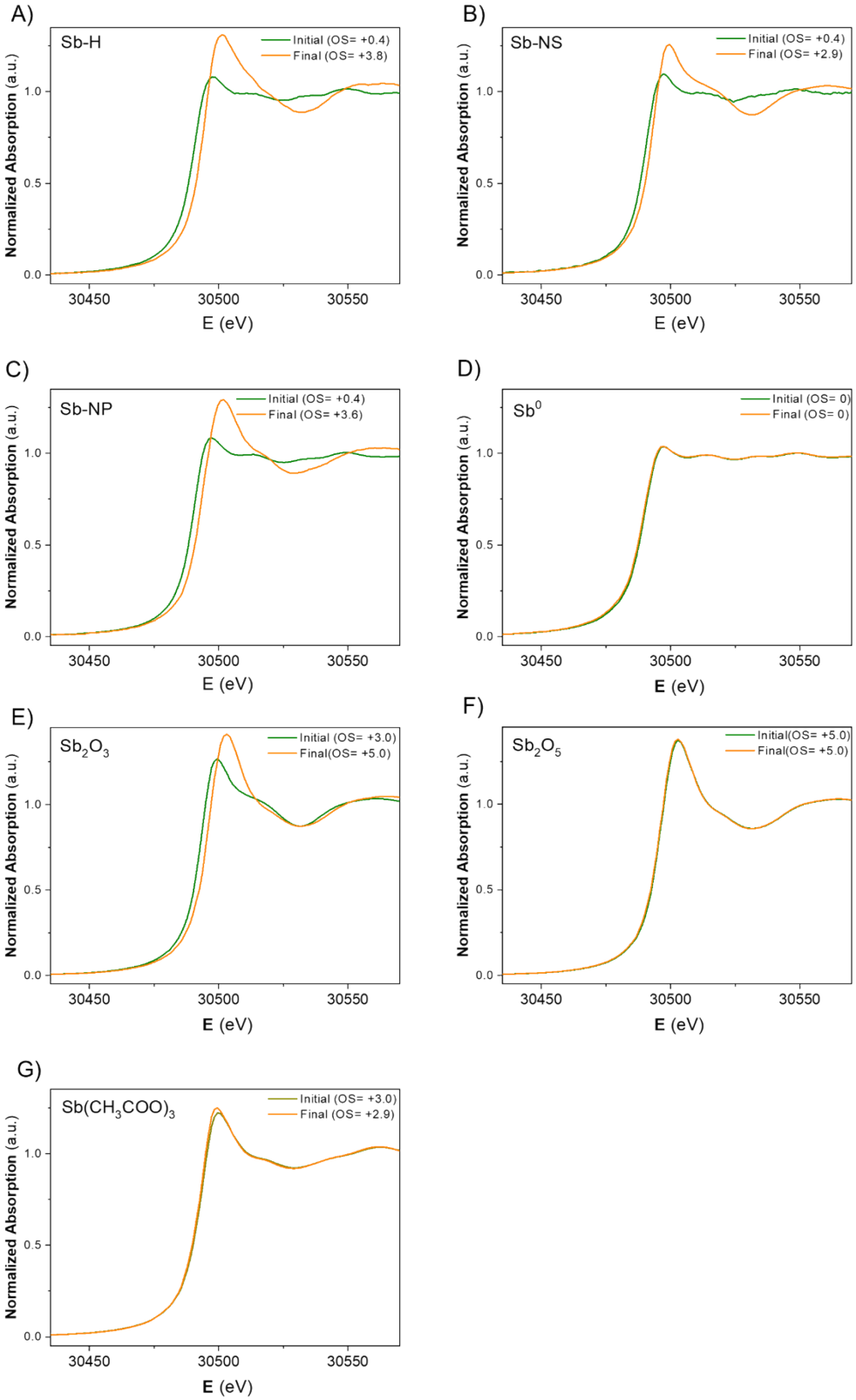

***Figure S6**: XANES spectra of the ex-situ measurements on the Sb reference species before (initial) and after (final) incubating 1 week in DMEM cell culture media.*

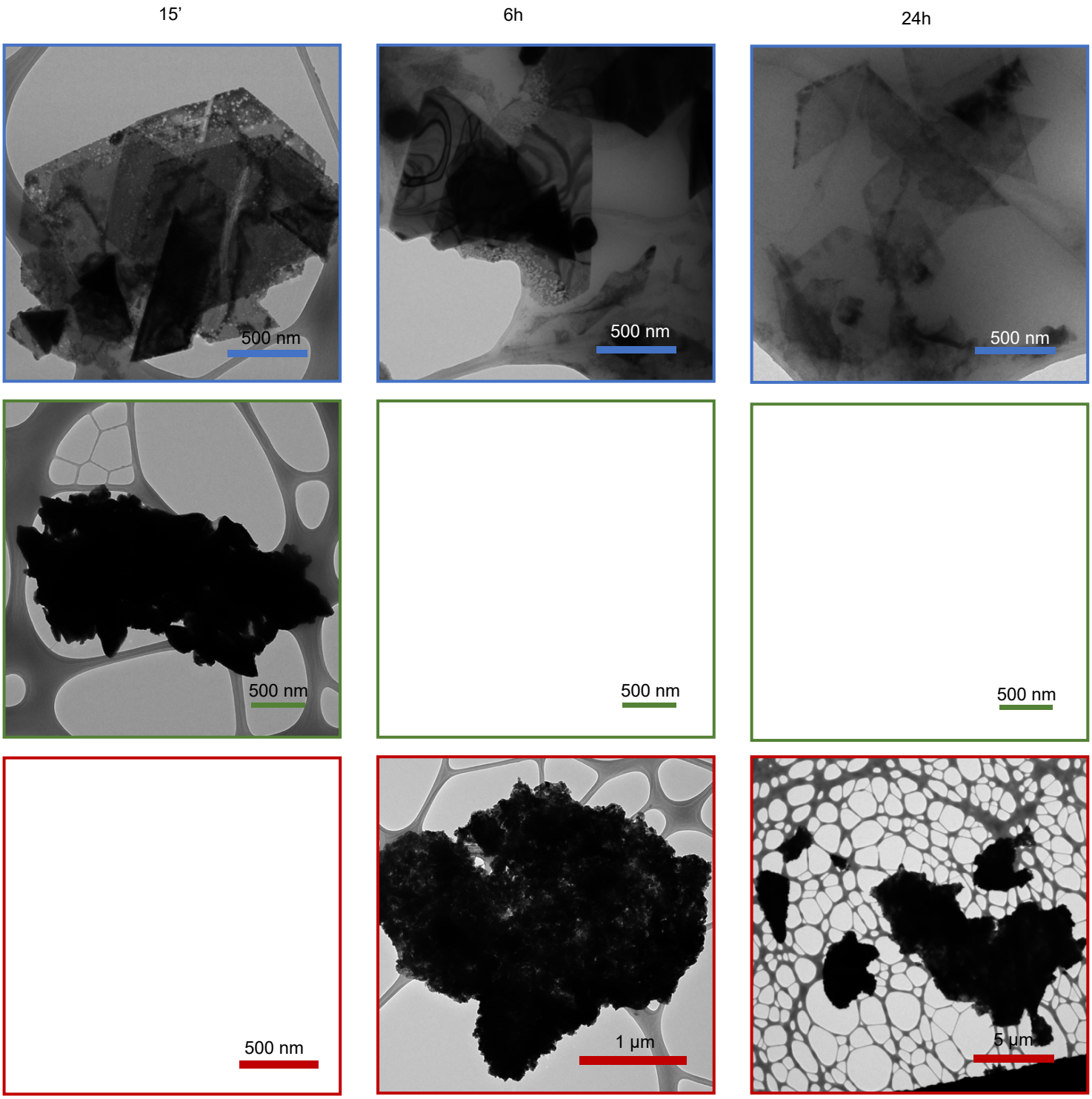

Figure S7: *TEM images of the Sb-nanomaterials incubated at 37 ºC in DMEM during the indicated times for the Sb-H, Sb-NS and Sb-NP samples highlighted in blue, green and red colors, respectively.*

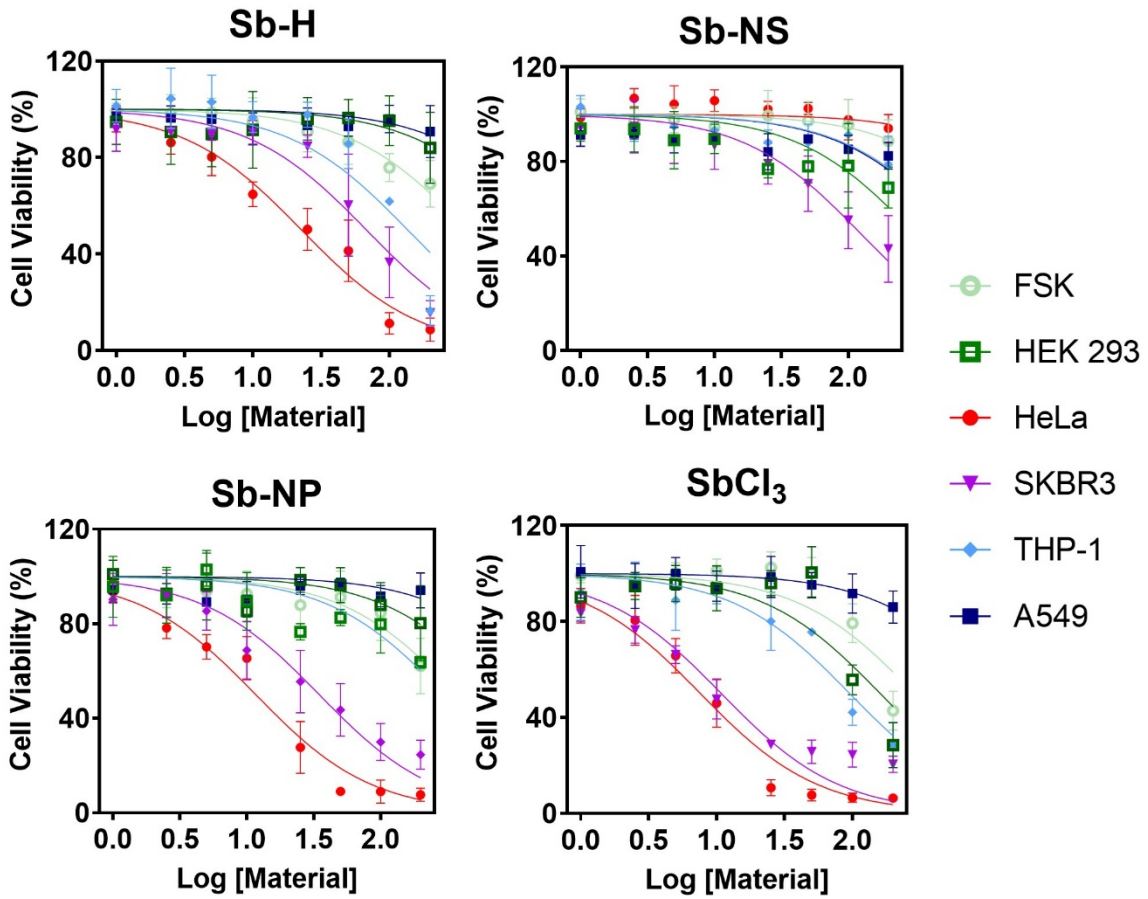

Figure S8: *Dose-response curves of the tested compounds, obtained from the MTT viability assays. Obtained using the GraphPad Prism 8 software.*

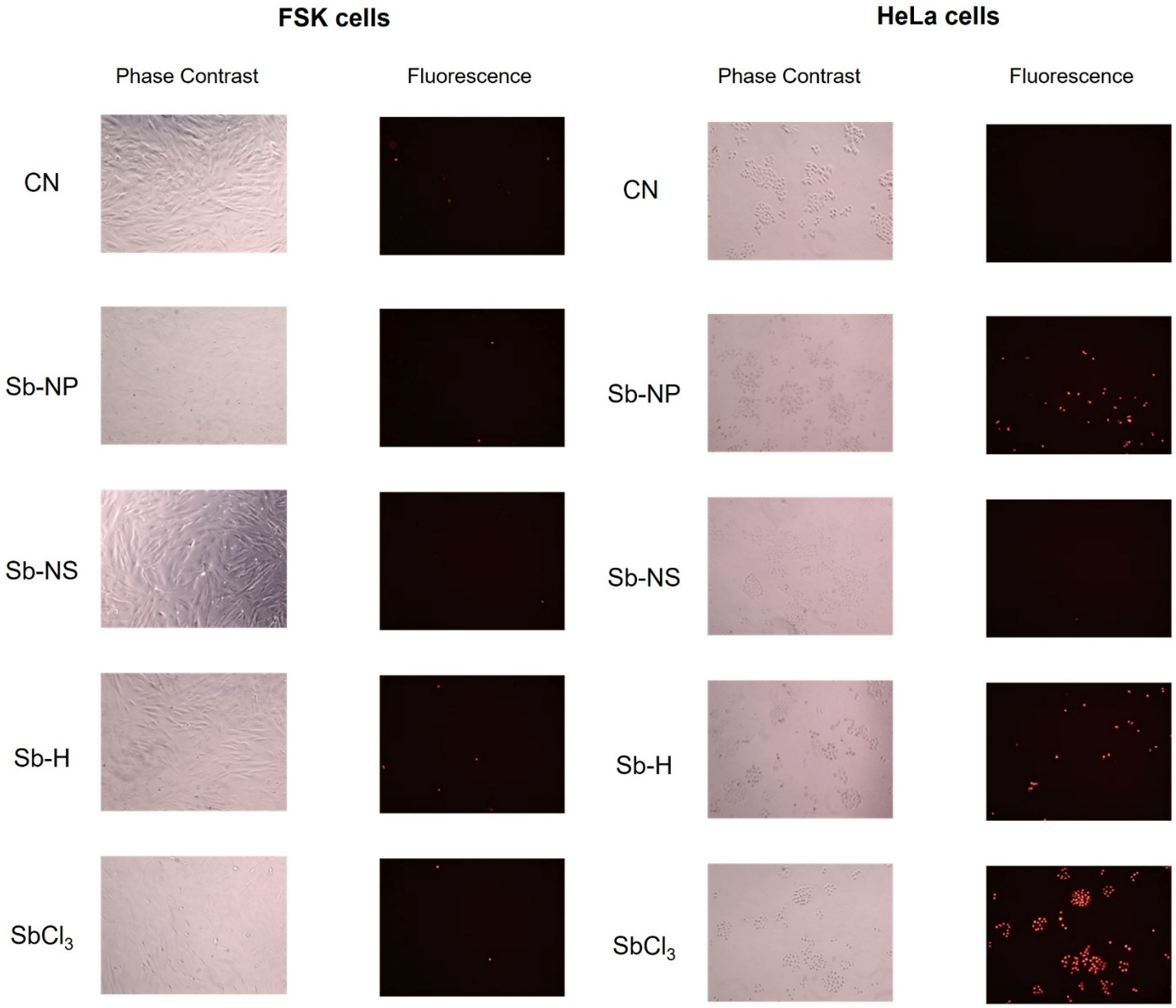

***Figure S9**: Optical microscope images and fluorescent images (λ_{exc}= 545nm) of the Propidium iodine test after treatment with the different nanomaterials at 25 µg/mL.*

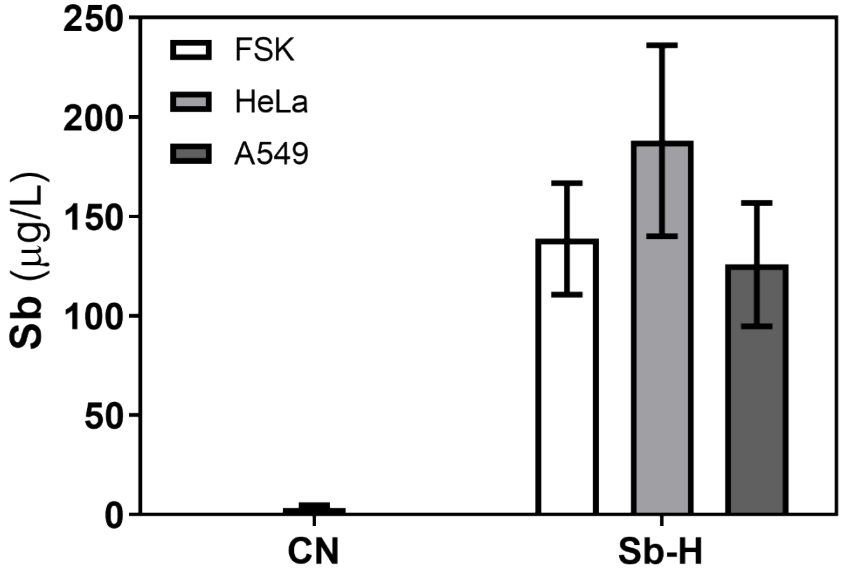

Figure S10: *ICP-MS analysis of the intracellular content of the cells treated with the Sb-H at 25 µg/mL.*

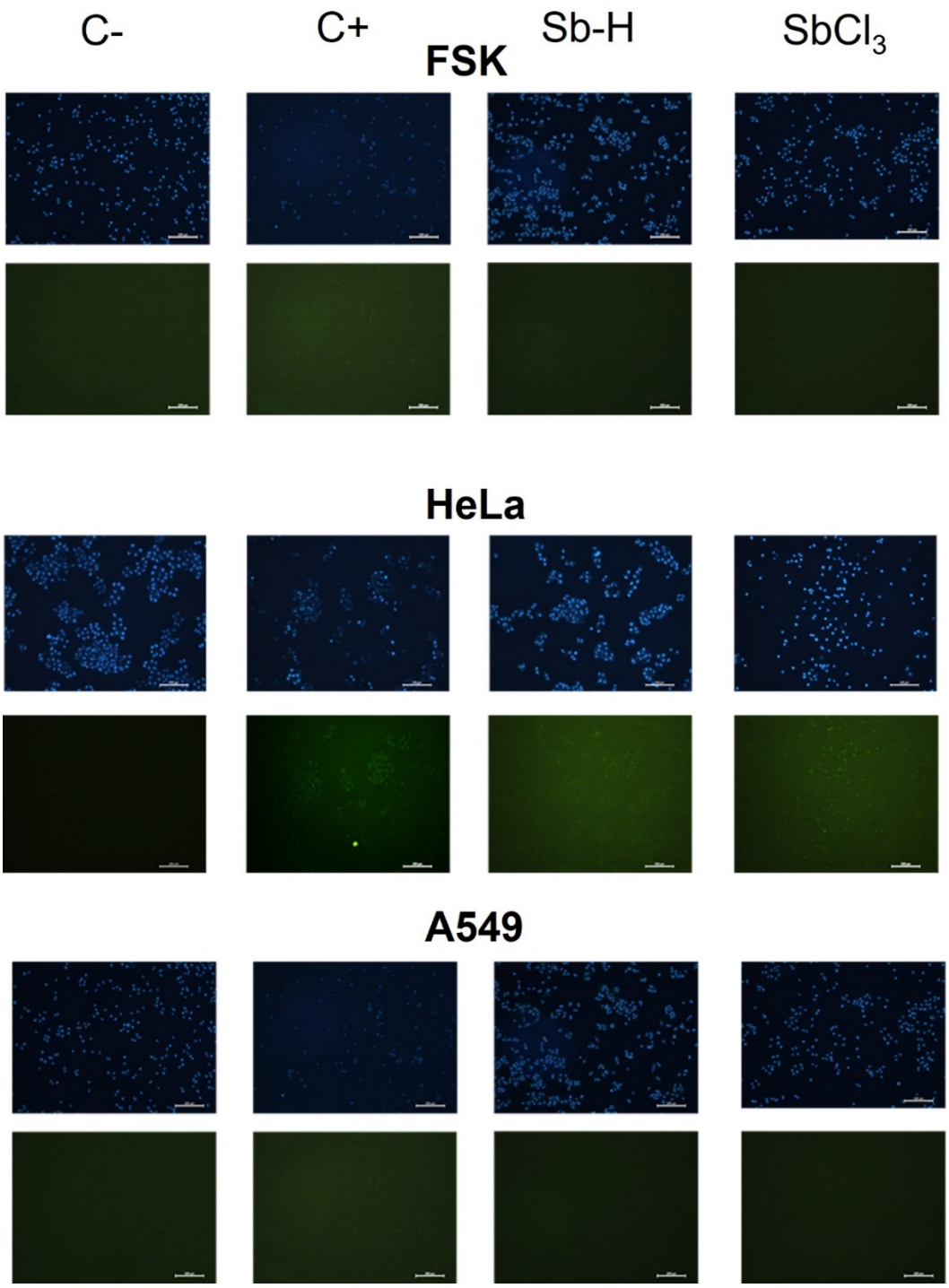

Figure S11: *Representative fluorescence microscopy images of ROS experiments. Cell lines (HeLa, FSK and A549) were seeded on 24-well plates and incubate in the presence of Sb-nanomaterials at 25 µg/mL for 24h. Next day, cells were treated with 25µM of 6-carboxy-2',7'-dichlodihydrorofluorescein diacetate (carboxy-H_2DCF-DA) to detect ROS formation (Fluorescein FITC filter) and Hoechst 33342 to visualize nuclei (DAPI filter). C-: non treated cells, C+: cells treated with tert-butyl hydroperoxide (100 µM). SB-H: cells treated with Sb nanomaterial. SbCl3: cells treated with antimony trichloride. Scalebar 200 µm.*