Visualising gold inside tumour cells following treatment with an antitumour gold(I) complex

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Supporting Information

Figure S1. NanoSIMS mass spectrum at 197 amu for samples of **1**, MDA cells treated with **1**, and gold foil.

Figure S2. Electron micrographs of healthy MDA cells processed in the absence of **1**.

Figure S3. Example EFTEM pre- and post-edge energy window images used for calculation of gold maps.

Figure S4. Energy dispersive X-ray spectra obtained from cells treated with **1**.

Figure S5. NanoSIMS ion maps for a sample of **1** in the absence of cells.

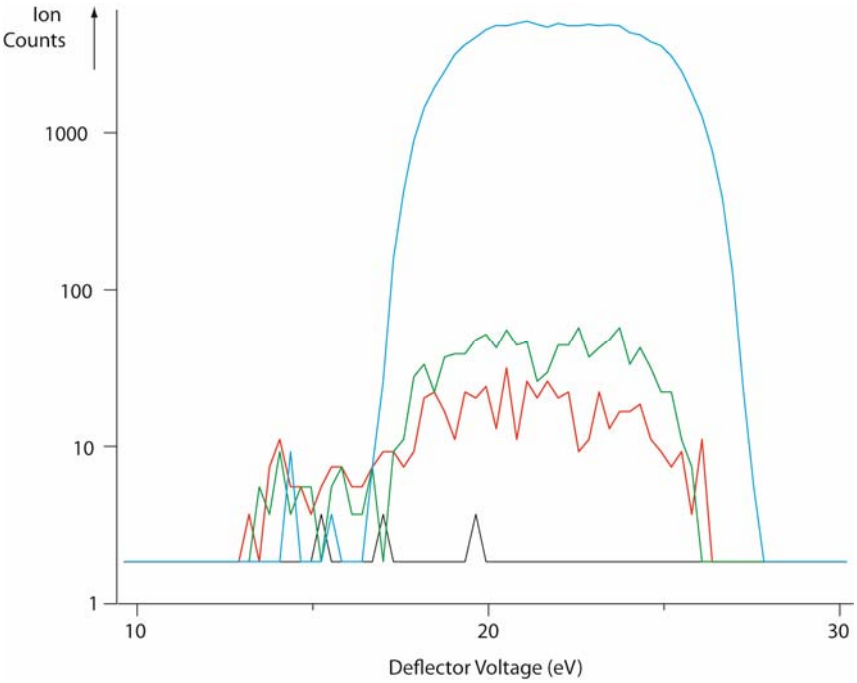

Figure S1. The mass spectrum at 197 amu for the control MDA cells, treated MDA cells, and a sample of 1 dried onto Si wafer. The NanoSIMS mass spectrometer was tuned to a mass resolution of about 10,000 (CAMECA definition), using a 40 µm entrance slit (ES_3), 200 µm aperture slit (AS_2), and a 10 % signal decrease at the Energy Slit (EnS). The $^{197}Au^-$ mass line was calibrated using metallic Au foil before each analysis, and the deflector voltage was slightly offset to the right of the centre of the $^{197}Au^-$ peak to avoid unknown interferences on the low mass side. The magnetic field was not changed, for the duration of each analysis session. Sample of 1 shown in blue (–); sample of cells treated with 1 for 2 h shown in green (–); sample of cells treated with 1 for 1 h shown in red (–); and control shown in black (–).

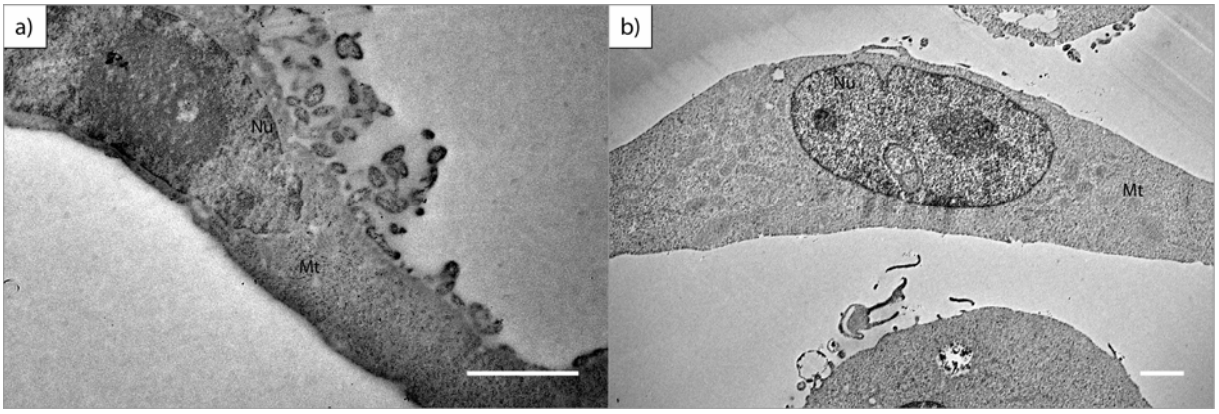

Figure S2. a) and b) MDA cells processed in the absence of 1. The section in b) has been double stained with uranyl acetate and lead citrate for increased contrast.[1] In both cases the cells show typical morphology of normal MDA cells; elongated consistent with adherent morphology, and the nuclei (Nu) and mitochondria (Mt) are clearly visible. Scale bars = 2 µm.

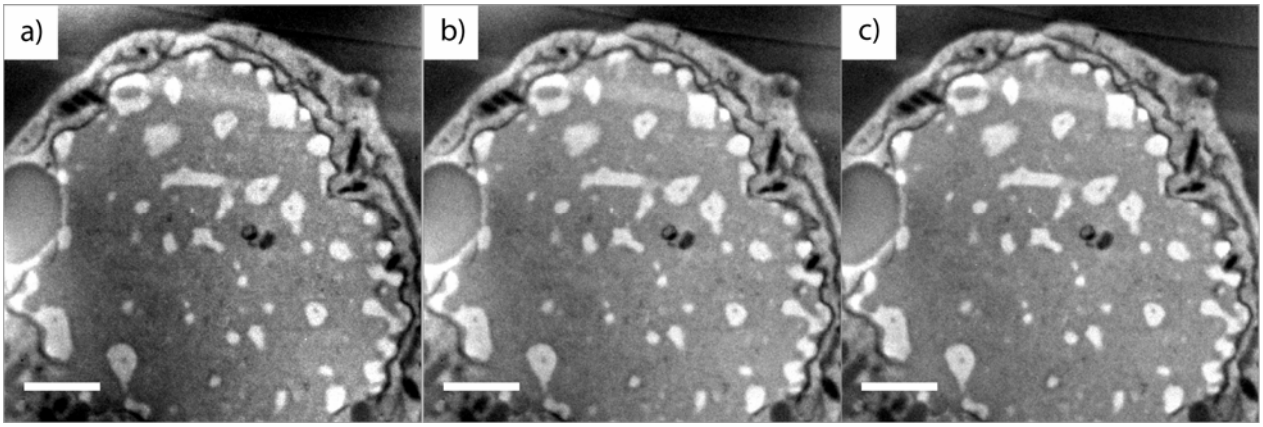

Figure S3. a) and b) EFTEM pre-edge energy filtered images 1 and 2, and c) post-edge energy window image for a thin section of an MDA cell after 4 h treatment with 1.

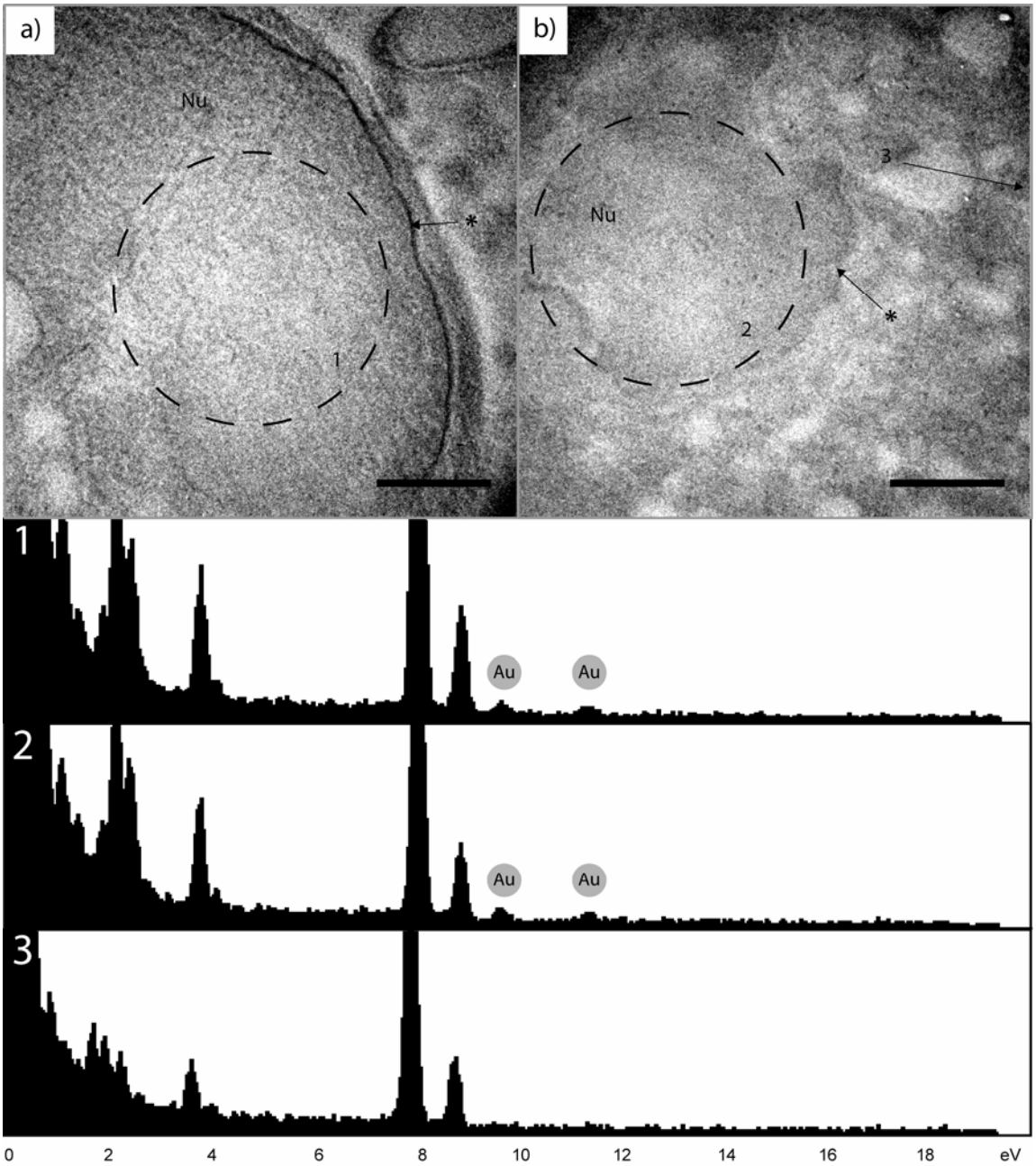

Figure S4. a) and b) Two nuclear regions of thin sections of MDA cells after 4 h treatment with 100 µM 1. The dotted circles in a) and b) (numbered 1 and 2) mark the placement of the electron beam for acquisition of EDS spectra 1 and 2 respectively. (*) marks the boundary of the nucleus. The electron beam was placed on empty resin for acquisition of EDS spectrum 3, out of the field of view of figure b), showing that the Au signal is confined to the cells, and no Au counts were detected in the resin. Scale bars = 2 µm.

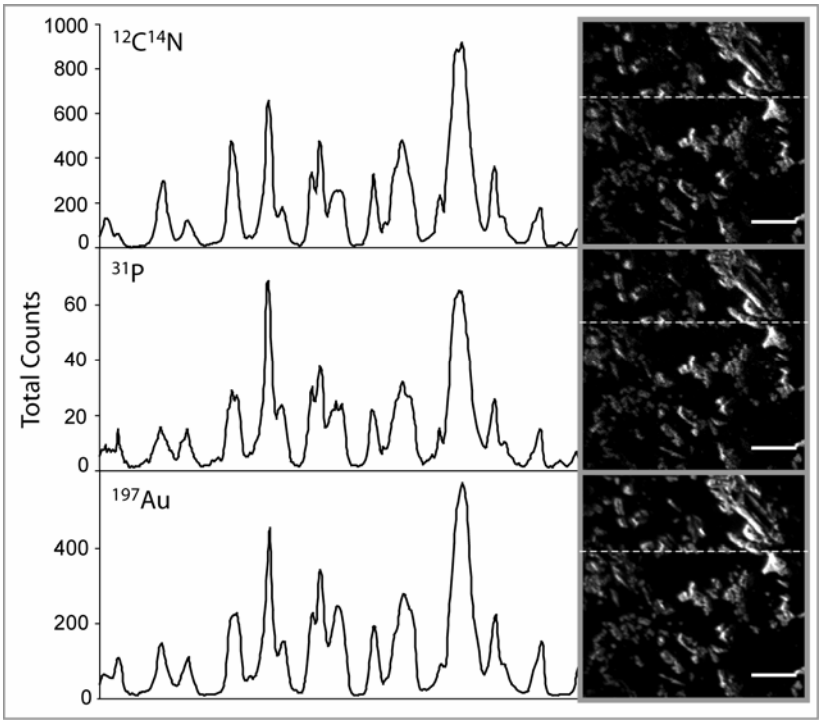

Figure S5. Line scans corresponding to the dotted line drawn across the NanoSIMS ion maps obtained from a sample of 1 in the absence of cells, processed as for all of the cell samples. Comparable line scans show the colocalisation of $^{31}P^-$ and $^{197}Au^-$, indicating the drug is intact. Lower counts of $^{31}P^-$ are observed compared to $^{197}Au^-$ due to lower ion yield, and as such ratios of total ion counts are meaningless in this case.

References

1. T. Hanaichi, T. Sato, T. Iwamoto, J. Malavasi-Yamashiro, M. Hoshino, N. Mizuno, A stable lead by modification of Sato's method. *Journal of electron microscopy* 1986, *35*. 304.