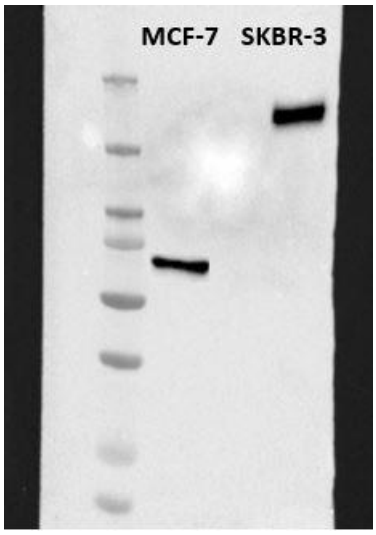
Electronic Supplementary Material (ESI) for Analyst.

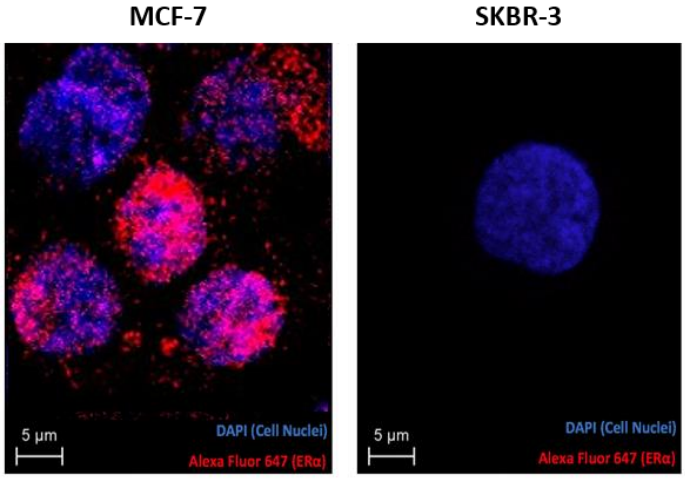
Characterisation of Estrogen Receptor Alpha (ERα) Expression in Breast Cancer Cells and Effect of Drug Treatment Using Targeted Nanoparticles and SERS

Anastasia Kapara [a,b], Valerie Brunton [b], Duncan Graham [a], Karen Faulds *[a]

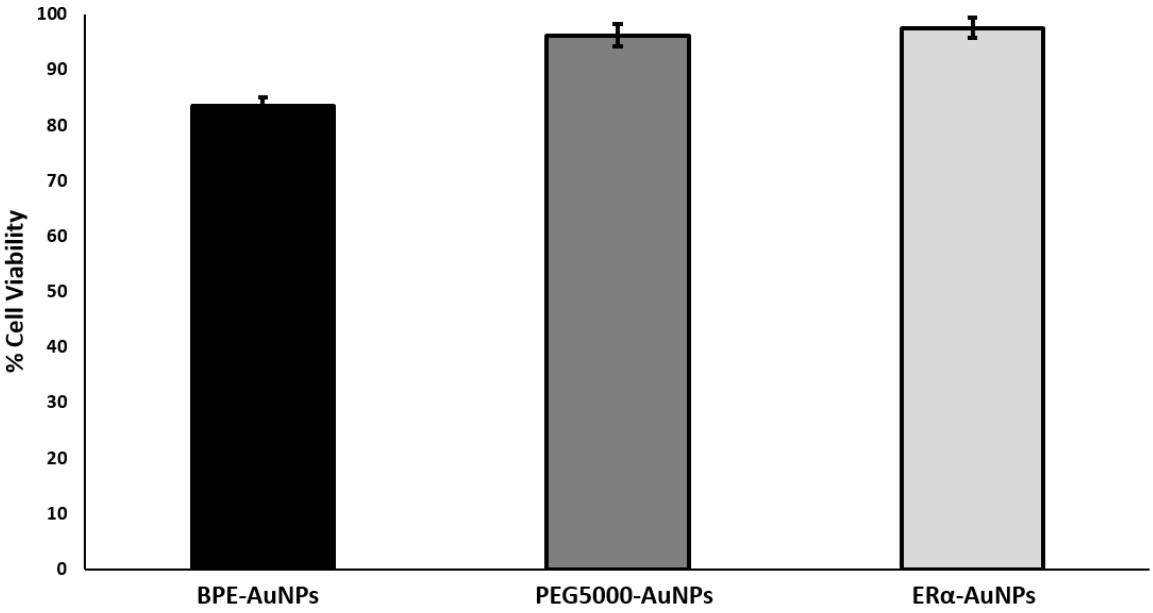
Supplementary information



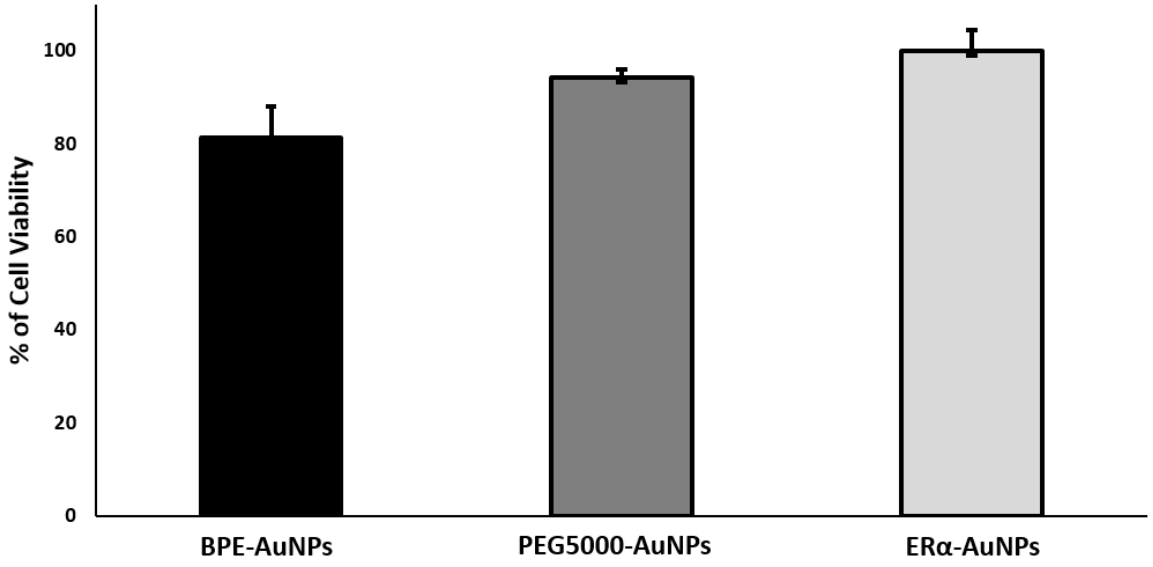
SI Fig. S1 MCF-7 cells express high levels of ERα while SKBR-3 cells are negative for ERα and positive for HER2. Cell lysates were prepared from breast cancer lines and western blot analysis carried out using a primary antibody against ERα and another one against HER2 (ErbB2).



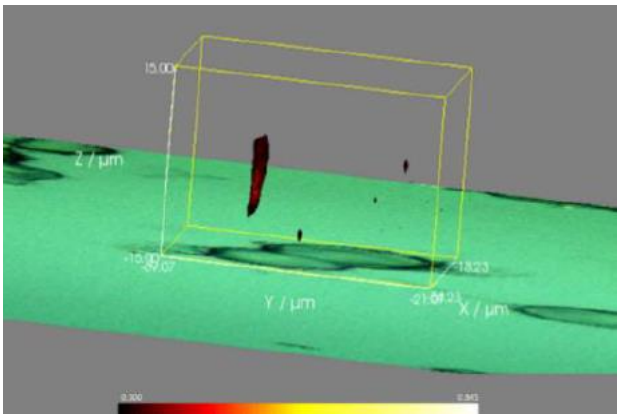
SI Fig. S2 Immunofluorescence analysis for ERα distribution in MCF-7 and SKBR-3 cells. ERα expression was detected in MCF-7 cells in contrast to SKBR-3 cells. ERα was stained with Alexa Fluor® 647 (red) and nuclei stained with DAPI (blue). Scale bar= 5 µm.



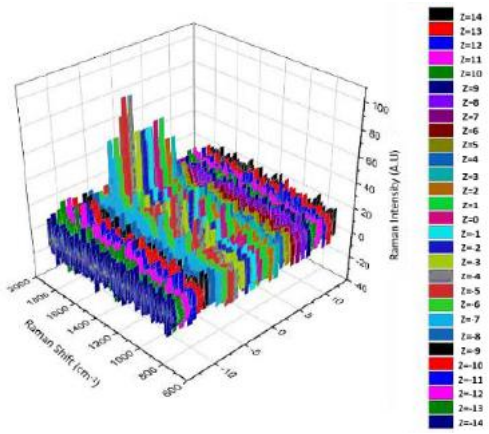
SI Fig. S3 Cell viability carried out using trypan blue cell viability assay for MCF-7 cells following treatment with 60 pM BPE-AuNPs, 60 pM PEG5000-AuNPs or 60 pM ERα-AuNPs for 48 h Data are expressed as the mean ± standard deviation of experiments performed in three biological repeats.



SI Fig. S4 Cell viability carried out using trypan blue cell viability assay for SKBR-3 cells following treatment with 60 pM BPE-AuNPs, 60 pM PEG5000-AuNPs or 60 pM ERα-AuNPs for 48 h Data are expressed as the mean ± standard deviation of experiments performed in three biological repeats.



SI Fig. S5 SERS signal in MCF-7 came from within the cells rather than the surface. 3D SERS map from MCF-7 treated with ERα-AuNPs (60 pM, 2h). The images were generating using a Renishaw InVia Raman microscope with 50× magnification NIR APO Nikon water immersion objective with a 1.0 NA and 1.2 mW laser power (10% power) from a HeNe 633 nm excitation source with step size y,x=1.0 µm and z= 3.0 µm, 0.1 s acquisition time and a 1200 l/mm grating in high confocality mode. The minimum and maximum look up table (LUT) thresholds were set to exclude any poorly correlating or noisy spectra, (min= 0.4).



SI Fig. S6 SERS signal in MCF-7 came from within the cells rather than the surface. 3D Raman mapping waterfall plot of average SERS spectra at different z-axis points treated with ERα-AuNPs (60 pM, 2 h). 3D SERS images were generating using a Renishaw InVia Raman microscope with 50× magnification NIR APO Nikon water immersion objective with a 1.0 NA and 1.2 mW laser power (10% power) from a HeNe 633 nm excitation source with step size y,x=1.0 µm and z= 3.0 µm, 0.1 s acquisition time and a 1200 l/mm grating in high confocality mode. SERS spectra were extracted from WiRE 4.4 and then transferred to OriginLab 2019b for the creation of the 3D waterfall graph.