

Figure 1. Transmission Electron Microscopy (TEM) images of gold nanorod- labelled MSC cells. Images of cells treated with uncoated GNRs (1st row) and with silica-coated-GNRs (15 nm, 23 nm, and 35 nm, 2nd to 4th rows). GNRs were in all cases entrapped in endosomal vesicles, but distances between the gold cores became greater as the silica shell thickness increased. Maintenance of

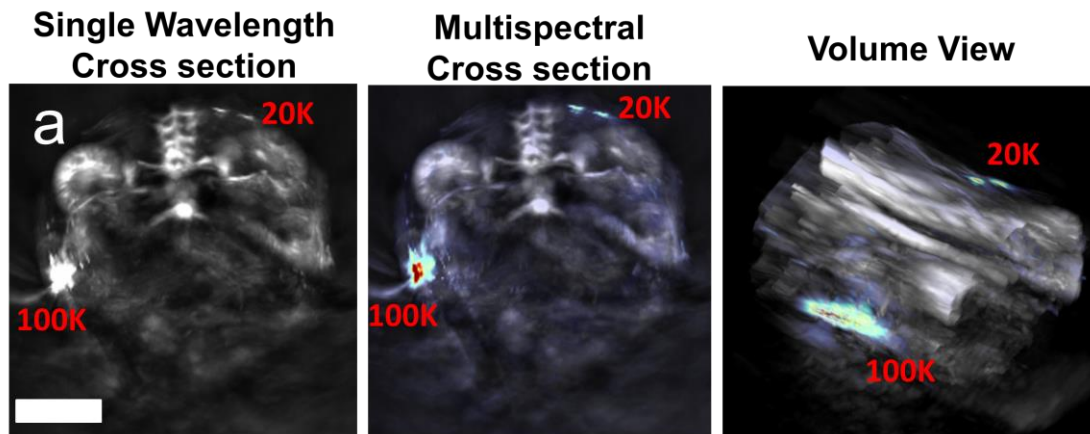


Figure 2. Imaging of cell clusters 3 days after injection of 2×10^4 and 1×10^5 Gold nanorods-labelled cells. The left column shows a single wavelength maximum intensity projection in the xy plane of the regions of interest. The great anatomical resolution of MSOT is observed here, allowing visualisation of small vessels (e.g. renal artery and renal vein). The middle column shows the same regions after multispectral processing, enabling high sensitivity detection of GNR-Si35 labelled cells. Volume views of the regions of interest are shown in the right column. Scale bars are 5 mm.

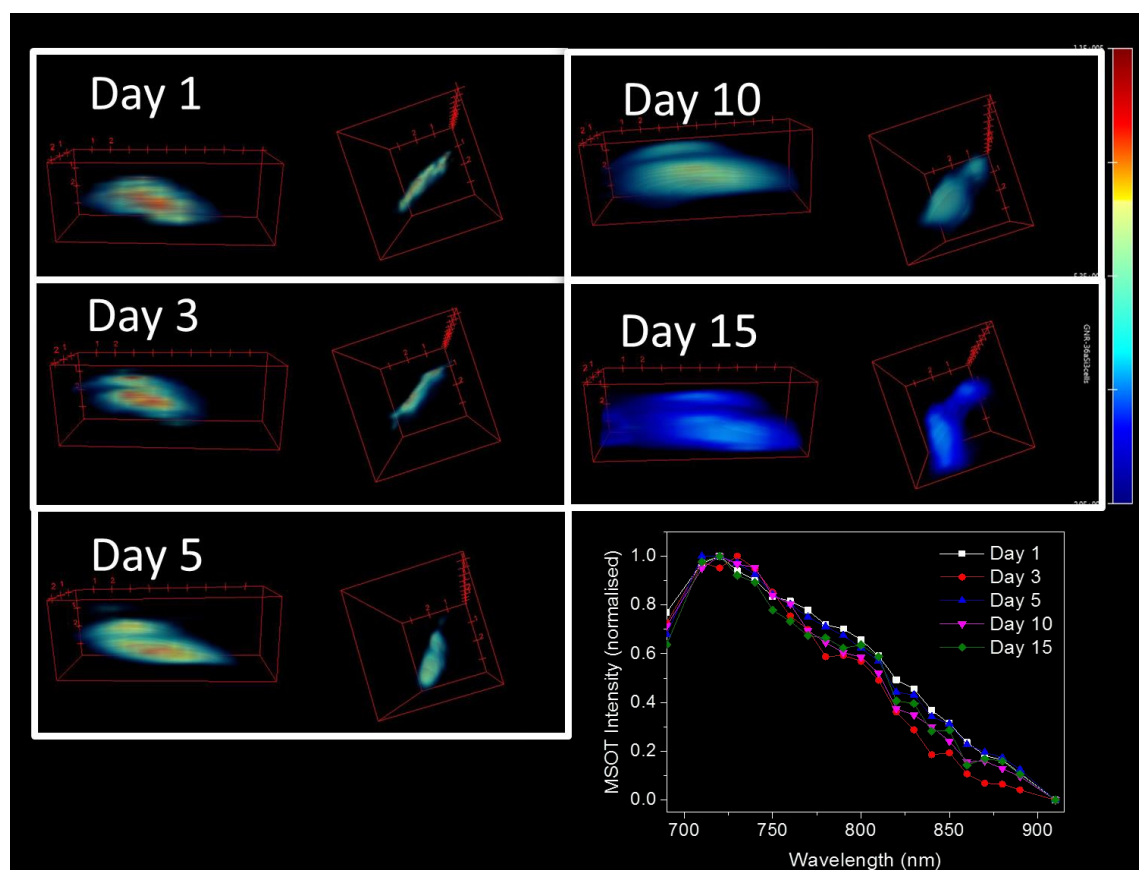


Figure 3. 3D in vivo monitoring of a Gold nanorods-labelled stem cells cluster. Cell cluster could be monitored as long as 15 days with a great 3D spatial resolution (box scale is in mm). Inset at bottom right demonstrate the maintenance of the photoacoustic properties of the cell cluster along time.

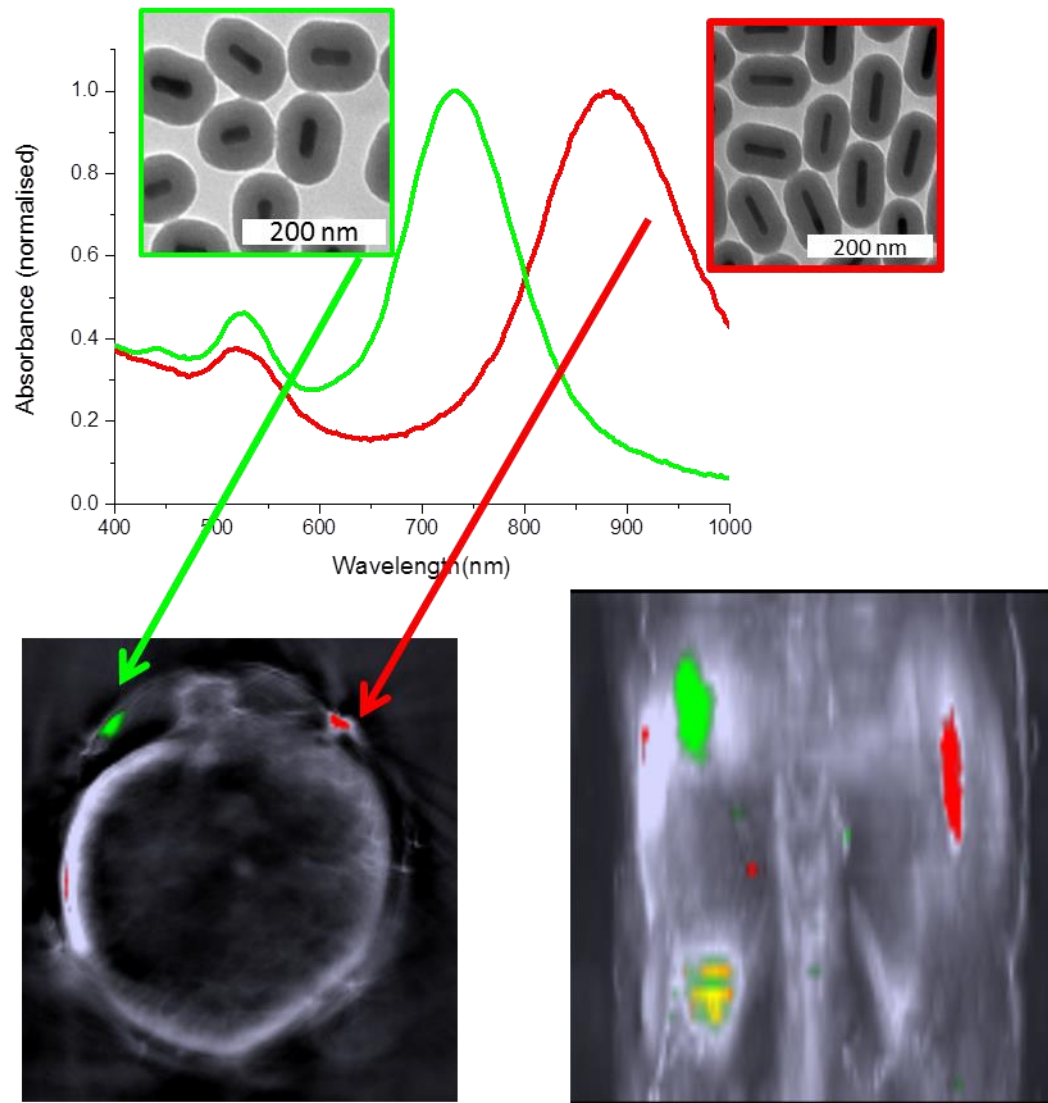


Figure 4. Multilabelling of different cell populations. Cells labelled with two different gold nanorods produced different photoacoustic signatures. This allowed us to clearly distinguish two populations of cells and enabled even colocalisation experiments (as indicated by the yellow resulting from overlaying the signal from the different populations)