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## P18 - Variation in the uptake of Nanoparticles by Monolayer Cultured Cells using High Resolution Ion Beam Imaging

Friday, 11 July 2014 13:00 (1 hour)

Nanoparticles (NPs) are being increasingly used in a wide range of biological applications, for example, as imaging probes or therapeutic agents<sup>1</sup>. Understanding the mechanism of cellular uptake of NPs is therefore important. It is known that the efficiency of internalization of NPs by individual cells depends on many factors, including the shape, size, and surface modification of the particles<sup>2,3</sup> as well as the timing of the cell within its cell cycle<sup>4</sup>. Previous work using PIXE has indicated that there can be as much as ten times variation in NP uptake in individual cells in the same cell population<sup>5</sup>.

We have demonstrated that Scanning Transmission Ion Microscopy (STIM) can image NPs in individual cells with a spatial resolution of around 20nm<sup>6</sup>, and this technique therefore offers a way of characterizing and quantifying the number of nanoparticles each cell has internalized. Here we present preliminary results on the variability of uptake of NPs in individual human-derived cells that have been grown under the same controlled conditions.

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**Session Classification:** Poster Session with Cheese and Wine