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DOI: 10.21767/2472-1123-C5-015**CANCER CELL IMAGING USING IN SITU GENERATED GOLD NANOCCLUSERS****Md Asif Amin¹ and Kankan Bhattacharyya²**¹Balurghat Mahila Mahavidyalaya, India²Indian Institute of Science Education and Research, India

In situ generated fluorescent gold nanoclusters (Au-NCs) are used for bio-imaging of three human cancer cells, namely, lung (A549), breast (MCF7), and colon (HCT116), by confocal microscopy. The amount of Au-NCs in non-cancer cells (WI38 and MCF10A) is 20–40 times less than those in the corresponding cancer cells. The presence of a larger amount of glutathione (GSH) capped Au-NCs in the cancer cell are ascribed to a higher glutathione level in cancer cells. The Au-NCs exhibit fluorescence maxima at 490–530 nm inside the cancer cells. The fluorescence maxima and matrix-assisted laser desorption ionization (MALDI) mass spectrometry suggest that the fluorescent Au-NCs consist

of GSH capped clusters with a core structure (Au₈₋₁₃). Time-resolved confocal microscopy indicates a nanosecond (1–3 ns) lifetime of the Au-NCs inside the cells. This rule out the formation of aggregated Au–thiolate complexes, which typically exhibit microsecond (.1000 ns) lifetimes. Fluorescence correlation spectroscopy (FCS) in live cells indicates that the size of the Au-NCs is .1–2 nm. For in situ generation, we used a conjugate consisting of a room-temperature ionic liquid (RTIL, [pmim][Br]) and HAuCl₄. Cytotoxicity studies indicate that the conjugate, [pmim][AuCl₄], is non-toxic for both cancer and non-cancer cells.

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