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Strong two-photon-fluorescence from semiconducting polymer nanoparticles for high contrast imaging of cancerous cells SOUMITRA SATAPATHI, Department of Physics and Applied Physics, University of Massachusetts Lowell, Lowell, MA, 01854, ANOOP PAL, Biomedical Engineering and Biotechnology Program, University of Massachusetts Lowell, Lowell, MA, 01854, LIAN LI, US Army Natick Soldier Research, Development & Engineering Center, Natick, MA, 01760, SURESH GADDE, Nanodelivery Laboratory, Brigham and Women's Hospital, Harvard Medical School, Boston, MA 02115, DHIMITER BELLO, Biomedical Engineering and Biotechnology Program, University of Massachusetts Lowell, Lowell, MA, 01854, LYNNE SAMUELSON, University of Massachusetts Lowell, Lowell, MA, 01854, JAYANT KUMAR, Department of Physics and Applied Physics, University of Massachusetts Lowell, Lowell, MA, 01854 — Strong two-photon-induced fluorescence was observed from a series of novel fluorescent semiconducting polymer nanoparticles using femtosecond laser pulses at 800 nm. The conjugated polymer nanoparticles were fabricated by a simple technique known as the "mini emulsion" technique. The quadratic dependence of the two-photon-fluorescence was confirmed by varying the laser intensity. The two-photon-absorption cross- sections of the nanoparticles were determined in aqueous dispersions by comparing with that of Rhodamine 6G. The deep penetration of the near-infrared laser together with large absorption cross-section demonstrated here, renders these fluorescent polymer nanoparticles as ideal candidates for high contrast in vivo fluorescent imaging of certain tumor cells.

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