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Facile and green synthesis of biodegradable gold nano-dandelions for potential simultaneous CT imaging and radiotherapy

Yao-Chen Chuang, Chia-Hui Chu and Leu-Wei Lo
National Health Research Institutes, Taiwan

Gold nanoparticles (AuNPs) have been excellent candidates in cancer radiotherapy. As AuNPs are not biodegradable, concerns about long-term toxicity have restricted their translation into the clinic. Herein, a new type of metabolizable flower-like gold nanoparticles (i.e., gold nano-dandelions, GNDs) is successfully synthesized by environment-friendly route in the presence of gelatin and ascorbic acid assistance and was scalable to gram scale-quantity. A key novel feature of the proposed synthesis is the formation of GNDs grow directly by seed-mediated approach without assistance of additional biodegradable materials and the shapes and sizes are fine-tuning by the synthetic parameters, such as ratio of [HAuCl4]/[gelatin] and seed concentration. Our establish GNDs exhibit important applications in simultaneous enhanced computer tomography (CT) imaging and radiotherapy in comparison with conventional spherical ones. Over time, the biodegradable GNDs degrades under physiological environments that leads to disassembly of the GNDs into debris, which is favorable for efficient body clearance.

Biography

Yao-Chen Chuang has completed his PhD from National Chiao Tung University and his Postdoctoral studies from National Health Research Institutes.

040714@nhri.org.tw

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