In this work, the use of gold nanoparticles (AuNPs), synthesised using Curcuma mangga (CM) extract in photothermal killing of breast cancer (MCF-7) cells is demonstrated. CM-AuNPs showed higher photothermal heating efficiency compared to citrate-AuNPs upon irradiation with a 532 nm laser. In addition, treatment of MCF-7 cells with CM-AuNPs coupled with laser irradiation for 120 s was found to significantly reduce (72%) the cell viability compared to about 13%, obtained with citrate-AuNPs. Results from flow cytometry showed that the CM-AuNP-dependent photothermal-induced MCF-7 cells death was triggered mainly by apoptosis mechanism. All these results suggested the potential use of CM-AuNPs as therapeutic agents in cancer therapy.