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## Targeted photodynamic diagnosis of colorectal cancer

**Abstract.** Colorectal cancer (CRC), currently remains a challenge to diagnose and is the third most diagnosed cancer worldwide. Photodynamic diagnosis (PDD) is a promising early diagnostic approach which uses photosensitizers for fluorescence detection of malignant cancer cells without inducing tumour damage. In this study, ZnPcS4 a photosensitizer with pronounced chemical properties due to its tetra sulphonation was incorporated with specific CRC targeting antibodies (Anti-GC-C) on the surface of heterobifunctional amine-functionalized and PEG stabilized gold nanoparticles (AuNPs), to form a final actively targeted PS nanoconjugate (ZnPcS4 – AuNP-PEG5000-SH-NH<sub>2</sub> – Anti-GCC Ab). The final actively targeted PS nanoconjugate was successfully synthesized and characterized using spectroscopic techniques. Immunofluorescent photodiagnostic results confirmed that the final actively targeted PS nanoconjugate was able to localize within in vitro cultured CRC cells more specifically, due to its active targeting biomolecule (Anti-GCC Ab) than PS alone. The final targeted PS nanoconjugate offered highly specific and sensitive absorption of the PS in CRC cells and so allowed for the successful photodynamic diagnosis of CRCs in vitro.

### Apply to be considered for a student ; award (Yes / No)?

yes

### Level for award;(Hons, MSc, PhD, N/A)?

PhD

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