

## PHOTODYNAMIC ANTIMICROBIAL CHEMOTHERAPY ACTIVITY (AGAINST E. COLI) OF ZWITTERIONIC INDIUM PHTHALOCYANINES WHEN CONJUGATED TO AG BASED NANOPARTICLES

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There has been an increase in the number of drug resistant pathogens, for instance Methicillin-resistant *Staphylococcus aureus* (MRSA) [1]. The photoinactivation of micro-organisms has been suggested as a means to eliminate the problem of drug resistance. Photodynamic antimicrobial chemotherapy (PACT) is an antimicrobial treatment that is based on administering a photosensitizer, which localises in the microbial cells of the micro-organisms, followed by irradiation with visible light of specific wavelength [2]. The photo-excited photosensitizer produces reactive oxygen species (ROS) such as radicals and singlet oxygen which are lethal to the micro-organisms. This work explores the use of zwitterionic metallophthalocyanines (MPcs). Zwitterionic compounds display different charges on one molecule [2]. Cationic photosensitizers are more effective for Gram-negative bacteria; hence they are used in this work. The synthesised zwitterionic Pcs are conjugated to Ag-Fe<sub>3</sub>O<sub>4</sub> dimer and Ag@Fe<sub>3</sub>O<sub>4</sub> core shell nanoparticles via self-assembly and applied to PACT using the Gram-negative strain (*E. coli*) as the target bacteria.

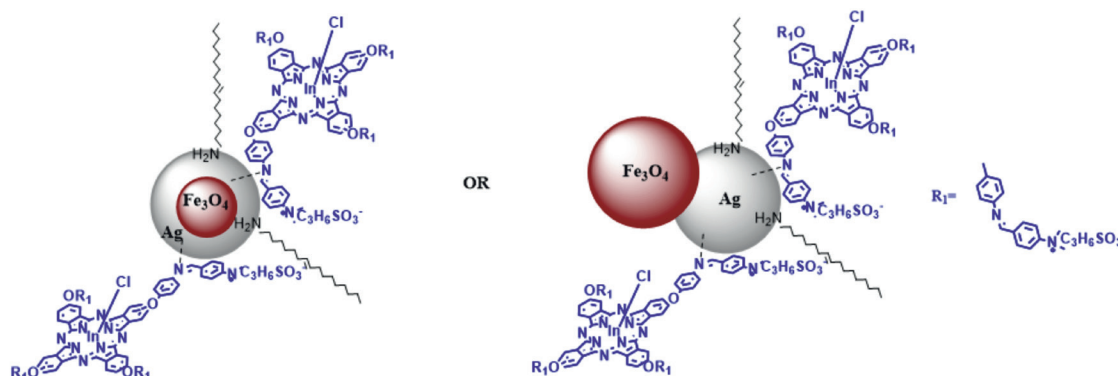


Figure 1: Phthalocyanine and nanoparticle dyad complex

### References

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2. A. Magadla, D. O. Oluwole, M. Managa, T. Nyokong, Physicochemical and antimicrobial photodynamic chemotherapy (against *E. Coli*) by indium phthalocyanines in the presence of silver-iron bimetallic nanoparticles, *Polyhedron*. 162 (2019) 30-38.