



Prof. Dr. Tebello Nyokong

Professor



Our research is multidisciplinary since it combines aspects of biology (bacterial, viral and fungal inactivation), chemistry (synthesis of the functional nanomaterials, for various applications) and physics (nonlinear optics). We develop nanocomposites containing porphyrin-type complexes and nanomaterials for applications in medicine (treatment of cancer and as antimicrobial agents), safety (as optical limiting as materials for the protection of the eye and other optical devices against sudden high intensity light), renewable energy (in dye sensitized solar cells and environmental control (for degradation of pollutants). We use electrospun nanofibers with embedded porphyrin-type complexes and their nanoparticle conjugates, as a solid support that can be readily recovered after use in pollution control.

Selected from the last three years 2021-2023

S. Centane, T. Nyokong, Co Phthalocyanine Mediated Electrochemical Detection of the Human Epidermal Growth Factor Receptor 2 in the Presence of Au and CeO₂ Nanoparticles and Graphene Quantum Dots **Bioelectrochem** 149 (2023) 108301; N. Nwahara, G. Abrahams, J. Mack, E. Prinsloo, T. Nyokong; A hypoxia responsive silicon phthalocyanine containing naphthquinone axial ligands for photodynamic therapy activity, **J. Inorg. Biochem**, 239 (2023)

112078; L. C. Nene, T. Nyokong, Phthalocyanines and Graphene Quantum Dots Nano-systems as Dual Anti-Cancer Sensitizers for Photo-Sonodynamic Combinatorial Therapy **Diamonds and Related Materials**, 131 (2023) 109549; S. Mgidlana, P. Sen, T. Nyokong, Dual action of asymmetrical zinc(II)phthalocyanines conjugated to silver tungstate nanoparticles towards photodegradation of tetracycline and inactivation of *Staphylococcus aureus* bacteria; **J. Photochem. Photobiol. A: Chem** **437** (2023) 114444; L.C. Nene T. Nyokong, The *In-vitro* Proliferation-Suppression of MCF-7 and HeLa Cell Lines Mediated by Differently Substituted Ionic Phthalocyanines in Sonodynamic Therapy Supplemented-Photodynamic Therapy; **J. Inorg. Biochem** 239 (2023) 112084, L.C. Nene, T. Nyokong, Enhancement of the *In Vitro* Anticancer Photo-Sonodynamic Combination Therapy Activity of Cationic Thiazole Phthalocyanines using Gold and Silver Nanoparticles, **J. Photochem. Photobiol. A:** 435 (2023) 114339, N. Nwahara, M. Motaung, P. Mashazi, J. Mack, E. Prinsloo, T. Nyokong, Dual singlet oxygen and nitric oxide-releasing silicon complex for augmented photodynamic therapy, **Materials Today Chem** 26 (2022) 101201, M.M. Ledwaba, N.B. Magaela, K.S. Ndlovu, J Mack; T. Nyokong, M. Managa, Photophysical and In vitro photoinactivation of Escherichia coli using cationic 5,10,15,20-Tetra(pyridin-3-yl) porphyrin and Zn(II) derivative conjugated to Graphene quantum dots, **Photodiagnosis and Photodynamic Therapy** 40 (2022) 103127, B. N. Magaela, K.S. Ndlovu, C. S. Tshangana, A. A. Muleja, B. B. Mamba, T. Nyokong and M. Managa, Photodegradation of ibuprofen using 5-10-15-20-tetrakis(4-bromophenyl) porphyrin conjugated to graphene quantum dots, **Optical Materials** 134 (2022) 113147, B. Babu, J. Mack, T. Nyokong, Sn(IV)-porphyrin with Mitochondria targeting properties for enhanced photodynamic activity against MCF-7 cells, **New J. Chem.** 46 (2022) 5288-5295, R. Nkhahle, T. Nyokong, Assessing the electrocatalytic activity of a localized push-pull system in cobalt phthalocyanine/graphene quantum dot hybrids, **Materials Chemistry and Physics** **280** (2022) 125842, A. Magadla, B. Babu, J. Mack, T. Nyokong, Positively charged styryl pyridine substituted Zn (II) Phthalocyanines for Photodynamic Therapy and Photoantimicrobial Chemotherapy: Effect of the number of charges, **Dalton Trans** 50 (2021) 9129-9136, Y.I. Openda, B.P. Ngoy, J.T. Muya and T. Nyokong, Synthesis, theoretical calculations and laser flash photolysis studies of selected amphiphilic porphyrin derivatives used as biofilms photodegradative materials, **New J Chem**, 45 (2021) 17320-17331