



RHODES UNIVERSITY, GRAHAMSTOWN, SOUTH AFRICA



MR NNAMDI NWAHARA (POSTDOCTORAL FELLOW)
SUPERVISOR: DISTINGUISHED PROFESSOR TEBELLO NYOKONG

CONTACT DETAILS:

Rhodes University
Institute for Nanotechnology Innovation
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EDUCATION DETAILS:

PhD (Chemistry) 2023 - Rhodes University, Grahamstown, South Africa
MSc – with distinction (Chemistry) 2018 - Rhodes University, Grahamstown, South Africa
BScH (Chemistry, with distinction) 2015 - Rhodes University, Grahamstown, South Africa
BSc (Chemistry and Biology) 2014 - National University of Lesotho

RESEARCH TITLE/PROJECT:

Developments on conjugates of phthalocyanines with folic acid and graphene quantum dots for photodynamic therapy

PUBLICATIONS:

1. Nwahara, Nnamdi; Britton, Jonathan; Nyokong, Tebello
Improving singlet oxygen generating abilities of phthalocyanines: aluminum tetrasulfonated phthalocyanine in the presence of graphene quantum dots and folic acid
Journal of Coordination Chemistry (2017), 70(9), 1601-1616.
DOI:10.1080/00958972.2017.1313975
<http://dx.doi.org/10.1080/00958972.2017.1313975>
2. Nwahara, Nnamdi; Achadu, Ojodomo J.; Nyokong, Tebello
In-situ synthesis of gold nanoparticles on graphene quantum dots-phthalocyanine nanoplateforms: First description of the photophysical and surface enhanced Raman scattering behaviour
Journal of Photochemistry and Photobiology, A: Chemistry (2018), 359, 131-144.
DOI:10.1016/j.jphotochem.2018.04.011
<https://doi.org/10.1016/j.jphotochem.2018.04.011>
3. Nwahara, Nnamdi; Nkhahle, Reitemetse; Ngoy, Bokolombe P.; Mack, John; Nyokong, Tebello
Synthesis and photophysical properties of BODIPY-decorated graphene quantum dot-phthalocyanine conjugates
New Journal of Chemistry (2018), 42(8), 6051-6061
DOI:10.1039/C8NJ00758F
<http://pubs.rsc.org/en/content/articlehtml/2018/nj/c8nj00758f>
4. Ion, R-M., Nyokong, T., Nwahara, N., Suica-Bunghez, I-R., Iancu, L., Teodorescu, S., Dulama, I.D., Stirbescu, R.M., Gheboianu, A. and Grigorescu, R.M.
Wood preservation with gold hydroxyapatite system
Heritage Science (2018), 6:37, 1-12
DOI: 10.1186/s40494-018-0202-5
<https://doi.org/10.1186/s40494-018-0202-5>
5. Nwahara, Nnamdi; Managa, Muthumuni; Prinsloo, Earl; Nyokong, Tebello
Design of Phthalocyanine-Nanoparticle Hybrids for Photodynamic Therapy Applications in Oxygen-Deficient Tumour Environment
ChemistrySelect (2019), 4(31), 9084-9095
DOI:10.1002/slct.201901466
<https://doi.org/10.1002/slct.201901466>
6. Sivuyisiwe Mapukata, Nnamdi Nwahara, Tebello Nyokong
The photodynamic antimicrobial chemotherapy of Staphylococcus aureus using an asymmetrical zinc phthalocyanine conjugated to silver and iron oxide based nanoparticles
Journal of Photochemistry and Photobiology A: Chemistry (2020) 402, 112813 (1-15)
DOI: 10.1016/j.jphotochem.2020.112813
<https://doi.org/10.1016/j.jphotochem.2020.112813>
7. Sithi Mgidlana, Nnamdi Nwahara, Tebello Nyokong

Photocatalytic desulfurization of dibenzothiophene using methoxy substituted asymmetrical zinc(II) phthalocyanines conjugated to metal tungstate nanomaterials

Polyhedron 197 (2021) 115053 (1-16)

DOI: 10.1016/j.poly.2021.115053

<https://doi.org/10.1016/j.poly.2021.115053>

8. Nwahara, Nnamdi; Adeniyi, Omotayo; Mashazi, Philani; Nyokong, Tebello

Visible light responsive TiO₂ - graphene oxide nanosheets - Zn phthalocyanine ternary heterojunction assisted photoelectrocatalytic degradation of Orange G

Journal of Photochemistry and Photobiology, A: Chemistry (2021), 414, 113291

DOI:10.1016/j.jphotochem.2021.113291

<https://doi.org/10.1016/j.jphotochem.2021.113291>

9. Nwahara, Nnamdi; Managa, Muthumuni; Stoffels, Mihlali; Britton, Jonathan; Prinsloo, Earl; Nyokong, Tebello

Synthesis of a near infrared-actuated phthalocyanine-lipid vesicle system for augmented photodynamic therapy

Synthetic Metals (2021), 278, 116811 (1-14)

DOI:10.1016/j.synthmet.2021.116811

<https://doi.org/10.1016/j.synthmet.2021.116811>

10. Pinar Sen, Nnamdi Nwahara, Tebello Nyokong

Photodynamic antimicrobial activity of benzimidazole substituted phthalocyanine when conjugated to Nitrogen Doped Graphene Quantum Dots against *Staphylococcus aureus*

Main Group Chemistry (2021) 20(2), 175-191

DOI: 10.3233/MGC-210030

<https://content.iospress.com/articles/main-group-chemistry/mgc210030>

11. Nnamdi Nwahara, Garth Abrahams, Earl Prinsloo, Tebello Nyokong

Folic acid-modified phthalocyanine-nanozyme loaded liposomes for targeted photodynamic therapy

Photodiagnosis and Photodynamic Therapy 102527 (1-11)

DOI: 10.1016/j.pdpdt.2021.102527

<https://doi.org/10.1016/j.pdpdt.2021.102527>

12. Omotayo Adeniyi; Nnamdi Nwahara; Daniel Mwanza; Tebello Nyokong, Philani Mashazi

Nanohybrid electrocatalyst based on cobalt phthalocyanine-carbon nanotube-reduced graphene oxide for ultrasensitive detection of glucose in human saliva

Sensors and Actuators B: Chemical (2021) 348, 130723 (1-13)

DOI: 10.1016/j.snb.2021.130723

<https://doi.org/10.1016/j.snb.2021.130723>

13. Sivuyisiwe Mapukata, Jonathan Britton, Nnamdi Nwahara and Tebello Nyokong

The photocatalytic properties of zinc phthalocyanines supported on hematite nanofibers for use against methyl orange and *Staphylococcus aureus*

Journal of Photochemistry and Photobiology A: Chemistry, 424 (2022) 113637 (1-12)

DOI: 10.1016/j.jphotochem.2021.113637

<https://doi.org/10.1016/j.jphotochem.2021.113637>

14. Lekgowa Collen Makola, Nnamdi Nwahara, Muthumuni Managa, Tebello Nyokong
Photodynamic therapy activity of 5,10,15-tris(5-bromo-2-thienyl),20(phenylcarboxy)porphyrin
conjugated to graphene quantum dot against MCF-7 breast cancer cells

Journal of Coordination Chemistry, 75:7-8 (2022), 1112-1128

DOI: 10.1080/00958972.2022.2087515

<https://doi.org/10.1080/00958972.2022.2087515>

15. Nwahara, M. Motaung, G. Abrahams, P. Mashazi, J. Mack, E. Prinsloo, T. Nyokong
Dual singlet oxygen and nitric oxide-releasing silicon phthalocyanine for augmented photodynamic
therapy

Materials Today Chemistry 26 (2022) 101201 (1-14)

DOI: 10.1016/j.mtchem.2022.101201

<https://doi.org/10.1016/j.mtchem.2022.101201>

16. O. Adeniyi, N. Nwahara; D. Mwanza; T. Nyokong, P.N. Mashazi
High-performance non-enzymatic glucose sensing on nanocomposite electrocatalysts of nickel
phthalocyanine nanorods and nitrogen doped-reduced graphene oxide nanosheets

Applied Surface Science 609 (2023) 155234 (1-13)

DOI: 10.1016/j.apsusc.2022.155234

<https://doi.org/10.1016/j.apsusc.2022.155234>

17. Nnamdi Nwahara, Garth Abrahams, John Mack, Earl Prinsloo, Tebello Nyokong
A hypoxia responsive silicon phthalocyanine containing naphthoquinone axial ligands for
photodynamic therapy activity

Journal of Inorganic Biochemistry 239 (2023) 112078 (1-11)

DOI: 10.1016/j.jinorgbio.2022.112078

<https://doi.org/10.1016/j.jinorgbio.2022.112078>

CONFERENCE/WORKSHOPS:

**International Conference on Surfaces, Coatings and Nanostructured Materials (NANOSMAT-Africa
Conference), Cape Town, 19-23 November 2018**

Oral Presentation:

Nnamdi Nwahara, Ojodomo Achadu and Prof Tebello Nyokong

In-situ Synthesis of Gold Nanoparticles on Graphene Quantum Dots-Phthalocyanine Nanoplatfoms:
First Description of the Photophysical and Surface Enhanced Raman Scattering Behaviour

**11th International Conference on Porphyrins & Phthalocyanines (ICPP-11)
28th June to 3rd July 2021 (Virtual Meeting)**

Oral Presentation:

Nnamdi Nwahara, Muthumuni Managa, Earl Prinsloo, Tebello Nyokong
Oxygen Self-Sufficient Liposomal Systems for Photodynamic Therapy

**72nd Annual Meeting of the International Society of Electrochemistry
29th August to 3th September 2021 (Virtual Meeting)**

Oral Presentation:

Nnamdi Nwahara, Omotayo Adeniyi, Philani Mashazi, Tebello Nyokong
Ternary Heterojunction Assisted Photoelectrocatalytic Degradation of Orange G using Visible Light Responsive TiO₂ - Graphene Oxide Nanosheets - Zn Phthalocyanine

12th International Conference on Porphyrins & Phthalocyanines (ICPP-12)

Madrid, Spain 10-15 July 2022

Oral Presentation:

Nnamdi Nwahara, Garth Abrahams, Earl Prinsloo and Tebello Nyokong
Prodrug-modified Phthalocyanine for Photodynamic Therapy

AWARDS:

2016 – Received award for highest marks in Chemistry Honours

2018 - Investec top 100 - General Excellence and Leadership Awards

OVERSEAS TRAVEL:

Institutul National de Cercetare-Dezvoltare pentru Chimie si Petrochimie ICECHIM
Bucharest, Romania

Date: 3 Oct – 14 Nov 2016

Reason for visit: Research Collaboration (NRF SA/Romania): MSc Exchange Student

Ecole Nationale Supérieure de Chimie de Paris
Paris, France

16 Oct to 21 Dec 2019

Reason: SA/France Research Collaboration (trip sponsored by French Embassy)