

CURRICULUM VITAE

WARREN ANDREW ANDAYI (Ph.D)

Chemistry Lecturer

Department Physical & Biological Sciences

Murang'a University of Technology, Kenya

Email: wandayi@mut.ac.ke; warrenandayi@gmail.com

PERSONAL DATA

ORCID Number: 0000-0002-6331-7553

Nationality: Kenyan

EDUCATION & TRAINING

- **PhD. Chemistry:** University of Cape Town,
Thesis title: *Synthesis, Antimalarial Evaluation, β -Hematin Inhibition, In Silico and In Vitro ADMET Profiling of 4-Aminoquinoline-Hydroxypyridinone Hybrids.*
Supervisors: Prof. Kelly Chibale and Prof. Timothy Egan.
- **MSc. Chemistry:** Maseno University, Kenya
Thesis title: *Antimalarial and Antioxidant Compounds from Two Erythrina Species*
Supervisors: Prof. Abiy Yenesew (Univ. of Nairobi) and Prof. Jondiko. I. Ogoche. (Maseno University)
- **B Ed.Sc. Chemistry (major) and Mathematics:** Kenyatta University, Kenya.

POSTDOCTORAL RESEARCH WORK

1. **University of Pretoria, Vice Chancellor's Postdoctoral Research Fellow:** Apr 2013 – Sep. 2014.
Medicinal Chemistry Changes to Promote Polyamine Analogues as Antimalarial Drugs.
Supervisors: Prof. Lynn-Marie Birkholtz (Biochemistry) and Dr. Natasha October (synthetic organic chemistry).
2. **Rhodes University, Sandisa Imbewu Postdoctoral Research Fellow:** Apr. 2012 – Apr.2013.
Development of Colorimetric Probes Using Organic Dyes for Detection of Liver Toxicity.
Supervisors: Prof. Nelson Torto (analytical chemistry); Prof. Brent Pletschke (Biochemistry-enzyme kinetics) and Zenixole Tshentu (Synthetic organic & inorganic chemistry).
3. **University of Cape Town - H3D, Short-term Postdoctoral Research Fellow:** Jul.2011- April. 2012;
Hit to Lead Medicinal Chemistry Progression of Anti-tuberculosis Hits.
Joint Project: University of Cape Town, Chemistry Department- South African TB Research Innovation Initiative (SATRII) - National Institutes of Health, USA (NIH)-Ithemba Pharmaceuticals-Biofocus Galapagos-TIA/DST (Technology and Innovation Agency/Department of Science and Technology, South Africa):
Supervisors: Prof. Kelly Chibale and Dr. Nchinda Nchinda

OTHER TRAININGS

- **Short term training (1 week) in ISO 9001:2015 and ISO 19011:2011 [E]** Standards and Quality management Systems Requirements, Implementation and Auditing; 2017 (Trainer ACAL Consulting), and 2024 (Sleek management Consultancy)
- **Short term training in ISO/IEC 17025:2017 [E]:** General Requirements for the Competence of testing and Calibration of Labs, Implementation and Auditing, July and August 2024 (Trainer, Sleek Consultancy)
- **Fundamentals of X-Ray Diffraction Workshop, Nairobi: 18-20 July 2023 (Virtual)**
Facilitators: Cambridge crystallographic data Centre CCDC, International Center for Diffraction data ICDD, National Research Foundation, Kenya, and Masinde Muliro University, Materials Research Society of Kenya MRSK:
- **AREN African Reproducibility Network Training** March -August 2024: Aimed at training Lead persons to establish open science communities within Universities and research centres in Africa. Content included; Introduction to Open science, Open Access, Preprints, Open Repositories, Open Source, Open Peer review, Open data, and open research workflows.
- **Culturing of Malaria Parasites, *Plasmodium falciparum*, for Drug Susceptibility Tests.** At the Malaria Parasitology Lab, University of Pretoria. *Trainer:* Janet Reader, 2014
- **Computer Software Skills**
Online Teaching and learning platforms (Kenet; Zoom);
Accelrys Discovery Studio; Chem Draw 9.0; Volsurf modeller; Metasite; MoKa;
AutoDock 4.2; Auto Vina; SPSS; EndNotes; MS Office.
- **National Research Foundation National Postdoctoral Forum, On postdoctoral research and career matters.** Somerset West, Cape Town, Dec. 2011.
- **Stephan Lamprecht's "Market Driven Innovation" course** in Innovation and Intellectual Property, at the University of Cape Town Patent Office, Mowbray. 9 – 10 Sept. 2009.
- **The African Network for Chemical Analysis of Pesticides (ANCAP) 2nd and 3rd courses on Analysis of Pesticides in the Environment:**
(a) University of Nairobi, Department of Chemistry, (8–19 Sept., 2003)
(b) Tropical Pesticide Research Institute (TPRI), Arusha, Tanzania (1–7 August, 2004)
- **Academy of Science of South Africa (ASSAf) Mind the Gap Forum:**
Addressing knowledge and skills gap between high school and university curricula.
Riverside Club Conference Centre, Observatory, Cape Town, 21-22 Oct, 2010
- **International Leadership Institute Leadership Course,**
Regional conference, at the RGC, Egerton, Njoro, Kenya. 14 –16 Jan 2010.
- **ANCAP-IFS Training Workshop on Scientific Methodology, Development of Grant Application and Access to Scientific Literature.** Arusha, Tanzania. Co-ordinator: Prof. Shem Wandiga. 21-22 Oct. 2006.
- **Strengthening Mathematics and Science Education SMASSE:** In-Service Course for Science Teachers, Isinya, Kajiado, Kenya. August 2006.

PUBLICATIONS & CONFERENCE PAPERS

Research papers

1. Bett Kiprotich, Sharon Kiprotich, Jatani Ungula, Warren Andayi. **Structural and Optical Properties of ZnO:Al:Ga Co-Doped Nanoparticles: Investigation on The effects of pH of the Precursor Solution via a Simple Sol Gel route.** *American Journal of Materials Science* 2024, 14 (2) 21-30.

- Bilalo S.Q., Andayi W.A., Njagi.E.C., Ptoton M. B. **Concentrations of Selected Heavy Metals in soil and Tomatoes (*Lycopersicon Esculenta* Mill.) Grown in Kirinyaga County, Kenya.** *International Journal of Research and Analytical Reviews* 11, 2, 332, 2024.
- Moyo P, Invernizzi L, Mianda SM, Rudolph W, Andayi AW, Wang M, Crouch NR, Maharaj VJ. **Prioritised identification of structural classes of natural products from higher plants in the expedition of antimalarial drug discovery.** *Nat Prod Bioprospect.* 2023 Oct 12;13(1):37
- Phanankosi Moyo, Luke Invernizzi, Sephora M. Mianda, Mingxun Wang, Neil R. Crouch, Wiehan Rudolph, Warren A Andayi and Vinesh J. Maharaj. **Leveraging off higher plant phylogenetic insights for antiplasmodial drug discovery.** *Nat. Prod and Bioprospect.* 2023, 13:35
- Evans Kipkemoi, Warren A. Andayi, Eric C. Njagi, Brian Ptoton. **Analysis of Pesticide Residues in Tomatoes and French Beans from Murang'a and Kiambu Counties, Kenya.** *European Journal of Nutrition and Food Safety.* 121-132, 2020.
- Ntokozo S. Dambuza, Peter Smith, Alicia Evans, Jennifer Norman, Dale Taylor, Andrew Andayi, Timothy Egan, Kelly Chibale, Lubbe Wiesner. **Antiplasmodial activity, *in vivo* pharmacokinetics and antimalarial efficacy evaluation of hydroxypyridinone hybrids in a mouse model.** *Malaria Journal*, 14: 505. 2016.
- Bianca. K. Verlinden, Marna de Beer, Boobalan Pachaiyappan , Ethan Besaans, Warren A. Andayi, Janette Reader, Jandeli Niemand, Riette van Biljon, Kiplin Guy, Timothy Egan, Patrick M Woster, Lyn-Marie Birkholtz. **Interrogating alkyl and arylalkylpolyamino (bis) urea and (bis) thiourea isosteres as potent antimalarial chemotypes against multiple lifecycle forms of *Plasmodium falciparum* parasites** *Bioorg. Med. Chem.* 2015.
- Warren Andrew Andayi, Chibale Kelly, Egan Timothy, **Kojic acid derived hydroxypyridinone-chloroquine hybrids: synthesis, crystal structure, antiplasmodial activity and β -haematin inhibition.** *Bioorg. Med. Chem. Lett.* 2014
- Andayi Warren Andrew, Egan Timothy. J., Gut, Jiri. Rosenthal, Philip. J., Chibale, Kelly. **Synthesis, antiplasmodial activity and β -hematin inhibition of hydroxypyridone-chloroquine hybrids.** *ACS. Med. Chem. Lett.* 2013, 4, 642.
- Andayi, W. Andrew, Abiy Yenesew, Solomon Derese, Jacob O Midiwo, Peter M Gitu, Ogoche I. Jondiko, Norman Waters, Wangui, J., Pamela Liyala, Hosea Akala, Matthias Heydenreich, Martin G Peter, **Anti-plasmodial activities of flavonoids from *Erythrina saculeuxii*.** *Planta Medica*; 2006, 72: 187.

Book Chapters

- Moyo P., Vinesh Maharaj, V., Mutombo, S., Andayi, W. A., Amoah, L., Kalili, Asare, K. K., Danquah, C. A. (2023). **Discovery and Development of Antimalarial Drug Resistance Reversal Agents.** In *Frontiers in Anti-Infective Drug Discovery.* Bentham Science
- Andayi, W. A. (2020). **Are newly formed Kenyan universities ready to teach externally examined diploma courses in analytical chemistry?.** In L. Mammino & J. Apotheker(Eds.), *Research in Chemistry Education* (chapter 6), Springer Nature Switzerland AG. DOI 10.1007/978-3-030-59882-2_6

Conference presentations

- Frank Warren Conference Nov 2023. [Poster], Design, Synthesis and Biological Evaluation of Hydroxypyridinone Aminoquinoline compounds as Pharmacokinetic enhancers in malaria and HIV-AIDS.** Tinotenda Munapo, Victoria Mpelegeng Bvumbi and Warren A. Andayi. At University of Venda, Tohoyandou, South Africa.
- ChemEd 2023 Conference an AACTS Association of American Chemistry Teachers,** conference on Chemistry Education [Oral]. *Geopolitical Maps as Analogies in Teaching Diagonal physicochemical relationships in the Periodic Table.* on Chemistry Education, University of Guelph, Canada , July 26 2023.

3. **The 2nd African Conference on Research in Chemical Education; ACRICE**, (Oral). Are the Newly Formed Kenyan Universities Ready to Teach Externally Examined Diploma Courses in Analytical Chemistry? University of Venda, Thohoyandou, South Africa, 22-27 Nov 2015.
4. **The South African Chemical Institute (SACI) Convention 2013**, (Oral). Optimizing antimalarial iron chelator-chloroquine hybrids to overcome resistance. East London, South Africa. 2013.
5. **The Pan African Multilateral Initiative on Malaria (MIM) conference 2013**, (Poster) Synthesis, *in vitro* and *in vivo* antiplasmodial activity, β -haematin inhibition and cytotoxicity of hydroxypyridinone-chloroquine hybrids. International conference Centre, Durban. 2013
6. **Discussant/Panel Expert: Pre-MIM EviMalar Workshop on Career Opportunities for African Researchers in Malaria**, at the International Conference Centre, Durban. 2013.
7. **The 19th International Conference on Chelation (ICOC) for the treatment of thalassaemia, cancer and other diseases related to metal and free radical imbalance and toxicity** (Oral). 3, 4-Hydroxypyridinone-quinoline double drugs in combating drug resistant malaria: design, synthesis and biological evaluation. Brent Cross, London, UK. 2009.
8. **The 1st ANCAP, African Network of Chemical Analysis of Pesticides** (Oral). Plant Derived Larvicides in Malaria Management in Africa. Arusha International Conference Centre, Arusha, Tanzania, 2004.
9. **The 1st National Conference on Student Leadership Delinquency Guidance and Pastoral Care in Schools** (Oral). The Changing Culture upon our Youth as a Cause of Unrest in Schools. Kenyatta University, Nairobi. 1999,

Conference Attendance

1. **Centre for Chemico and Biomedical Research Unit (Rhodes University, Grahamstown) Drug Discovery Workshop** 31 May 2022
2. **Joint _AMRS-BITRI webinar & joint panel discussion** "Towards Sustainable Energy For African Development Nov 9, 2021
3. **American Association of Chemistry Teachers AACT Best of ChemEd Virtual summer conference and Symposium** 27-30 July 2021

Editorial Work and Review Work

- **Board of Reviewers' Editor**, eLife Sciences Publications, Jan 2023- Present
- **Peer Reviewer** *South African Journal of Agriculture and Extension SAJAE* 2024
- **Peer Reviewer: BMC Complementary Medicine & Therapies** (Springer-Nature) 2022-present
- **Peer Reviewer: Chemistry Teacher International**, (IUPAC) 2020
- **Peer Reviewer: Mini Reviews in Medicinal chemistry**, (Bentham Science), 2013
- **Peer Reviewer: South African Journal of Science**, (South African Academy of Science), 2013
- **Grant Reviewer: National Research Foundation**, (Department of Science & Technology, South Africa) 2014

TEACHING AND ADMINISTRATION EXPERIENCE AT UNIVERSITY LEVEL

TEACHING

- **Lecturer, Murang'a University of Technology, Kenya. Sept. 2014 – Present**

Courses Taught at Postgraduate (MSc) level

1. Advanced physical organic chemistry ACH618
2. Advanced analytical chemistry ACH615
3. Research Methods ACH625
4. Advanced Environmental chemistry ACH 602

5. Advanced Organometallic & Coordination Chemistry ACH 605

Courses Taught at Undergraduate Level

6. Organometallic Chemistry ACH403
7. Colloid and surface chemistry ACH412
8. Organic spectroscopy ACH316
9. Instrumental methods of analysis I ACH306
10. Subject Methods-chemistry TDC305
11. Quantitative Analysis ACH 208
12. Chemistry of main group elements ACH204
13. Atomic structure & chemical bonding ACH105
14. Chemical kinetics & electrochemistry ACH102
15. Safety methods in the laboratory ACH104
16. Biochemistry and biochemical techniques (for KNEC Diploma in Analytical chemistry)
17. Engineering Chemistry ACH114

▪ **Lab demonstrator, Maseno University, 2001-2003**

Demonstrator 1st year chemistry practicals

▪ **Tutor & lab demonstrator University of Cape Town, 2007- 2011**

Courses:

1. Scientific Writing project CEM 3005W
2. Medicinal Chemistry CEM 2013S
3. Organic and Inorganic Chemistry CEM 2008
4. General chemistry CEM 1009H (to BSc. Extended degree program GEPS)
5. General chemistry CEM 1000W (BSc regular)
6. Chemistry for Pre-Medical students CEM 1009H

THESIS EXAMINATION

1. **MSc Chemistry Thesis** entitled: *Optimization For Cassava Peels Bioethanol Production Using Taguchi Design Integrating Kinetics Of Saccharomyces Cereivisiae And Characterization For Sustainable Renewable Energy*. Candidate: Odongo Irene Akinyi, Murang'a University of Technology, 2024.
2. **MSc chemistry Thesis** entitled *Removal of Phenolic Compounds from Contaminated water using tertiary amine modulated corn starch*. Candidate: Haron Bosuben AS401/5067/2018, Murang'a University of Technology 2022
3. **MSc chemistry Thesis** entitled *Characterization and Modification of Clays From Selected Sites in Muranga and Nyeri Counties for Refractory Application*. By Hassan M. Lomertwala, Muranga University of Technology, 2020

STUDENT MENTORING & SUPERVISION

Completed Supervision and Mentoring

- **MSc Research & thesis, Murang'a University of Technology**, Co-supervision with Dr Ptoon Mnangata and Prof Eric Njagi; 2023-2024

Student: Somo Bilalo

Thesis title: *Determination of Concentrations of Selected heavy in Tomatoes from Kirinyaga county, Kenya.*

- **MSc Research & thesis, Murang'a University of Technology**, Co-supervisors: Dr Sharon Kiprotich, Dr. Jatani Ungula. 2023-2024

Student: Cornellius Kiprotich

Thesis Title: Synthesis of Cd doped Zinc Nanaoparticles for Photocell Anode Applications

Thesis title: Determination of Concentrations of Selected heavy in Tomatoes from Kirinyaga county, Kenya.

- **MSc Research & thesis supervisor, Murang'a University of Technology, 2019-2020.** Co-supervisors for Mr. Evans Kipkemboi
Thesis title: Analysis of pesticide residues in Tomatoes and French Beans in Muranga & Kiambu counties, Kenya
- **PhD. Organic synthesis Advisor, Rhodes University. Apr 2012- 2013**
for Ms. Bella Pule. Supervisor: Prof. Nelson Torto.
Thesis title: Colorimetric probe for detection of liver toxicity in HIV patients.
- **MSc. Organic synthesis lab advisor, University of Pretoria, Jan– Sept 2014,** For Mr. Ethan Besaans. Supervisors: Prof. LM Birkholt and Dr. Natasha October
Thesis title: Synthesis, structure-activity relationships and biological evaluation of optimised terminaly alkylated(bis)urea and (bis) thiourea polyamine analogues as antiplasmodial agents
- **BSc Hons. Student (Ms. Mashamaite) Co-supervisor, University of Pretoria. 2013-2014,** with Dr. Natasha October: *BSc (hons)Thesis title Design and synthesis of antiplasmodial polyamines*
- **BSc. Honours students' mini project Co-supervisor University of Cape Town, April – June 2009,** with Prof. Kelly Chibale. *Project Title: Optimization of the synthesis of Hydroxypyridinone-Aminoquinoline double drugs.*

Continuing Supervision and Mentoring

- **PhD Research and Thesis Supervisor.** Murang'a University of Technology. 2023- present
For Mr. Evans Kipkemoi. Thesis Title: *Impacts Of Catchment Land Use On Water Quality Of Small Wetlands In Murang'a County, Kenya*
- **MSc Research & thesis supervisor, Murang'a University of Technology, 2019-present** for Ms. Isabella Chege
Thesis title: Profilling heavy metals pollution of River Thiba Waters and its banks in the Kirinyaga county catchment areas and distributary at Masinga Dam.
- **Academic Advisor** for BSc Industrial and BSc. Analytical chemistry, Murang'a University of Technology, 2018 – present

OTHER SERVICES TO THE UNIVERSITY

- **Internal Auditor for ISO Standards Compliance Standards Compliance Standards Compliance** Quality Management Systems QMS, Information Systems Management (ISO 9001:2015) and Testing Lab ISO standards (ISO/IEC 17025:2017)
- **Teaching Practice Supervision/Assessor for B.Ed year 3:** Muranga University of Technology, School of Education and Humanities. From 2022- present
- **Department Examinations and Time table Coordinator:** Murang'a University of Technology Physical and Biological Sciences Department. from 2023- present
- **Chair of Department Physical & Biological Sciences:** Murang'a University of Technology (MUT), Kenya, Oct 2019-Oct 2020. Academic leadership and general management
- **Coordinator for School Postgraduate Studies:** MUT, 2018 – 2020

- **Dean of Students** at MUT, Kenya. Jan.2017 – Jul. 2018.
Achievements: Students Organization's constitution amendment to comply to Universities Amendment Act 2016; Increased formation & registration of Societies & Clubs; Fair and transparent students elections; Incorporation of Social media & internet into students communications channels; Development of proposals for off-campus work-study; Establishment of structures for students participation in graduation ceremonies; Review of Students welfare procedures to comply to ISO standards.
- **Acting Dean of Students**, June – August 2016, at MUT, Kenya.
- **Membership to University Committees**
 1. Membership:
Adhoc Committee on Internal Audit Planning Aug 2024; Students Disciplinary Appeals Committee - 2016/2017 & 2017/2018; Students Welfare Committee - 2017/2018; Quality Assurance and Standards Committee - 2017/2018; QMS Internal Audit 2017-present
 2. Chairmanship:
Suppliers Pre-Qualifications Sub-Committee-2017/2018; Students Governance Constitution Review Advisory Committee -2017/2018; Alcohol and Drug Abuse Committee -2017/2018

COMMUNITY OUTREACH AND EXTENSION WORK

1. **Comission for University Education CUE Resource Person** for Provision of Peer Review Services in Curriculum evaluation, Academic Institutional Review, Resarch and Consultancy. June 2024- present.

2. Exhibitor

(a) Commission for University Education National Exhibitions 2015-2017

(b) Nyeri Agricultural Shows 2016-2018

(presented exhibits on: Recycling & reuse of plastics; Recycling of vegetable & fruit wastes for Dyes; Food pH and applications in nutrition; Recycling of waste water; Application of human and animal urine in food & pasture crops production)

3. Facilitated & supervised students participation in off-campus community work

(a) Ndakaini Dam tree planting, 2018

(b) Muranga Town Garbage clean-up, 2017

(c) Bliss GVS Muranga Clinic health sensitization walk, 2017.

TEACHING EXPERIENCE AT HIGH SCHOOL LEVEL

- **Mentor** at Mpesa Academy student Mentorship Program, Thika Kenya 2019- 2020
- **Chemistry Portfolio Manager: UCT-PRACSI** (practical science) School outreach program in Cape Town townships/informal settlements (coordinator: Guy Reginald, UCT, department of molecular and cell biology), 2007-2008.
- **Volunteer Laboratory Demonstrator: UCT-LEAP School outreach program for chemistry**, Pinelands, Cape Town, (coordinator Dr Eileen Murray, UCT chemistry), 2007-2008.

GRANTS, AWARDS & HONOURS

- **University of Pretoria Centre for Sustainable Malaria Control, Faculty Research Theme grant, CSCM-FRT:** Value: ZAR. 78, 000 p.a. 2013-2014.

- **Oppenheimer Memorial Trust Scholarship**, at the University of Cape Town, Value: ZAR. 37, 000 towards PhD Thesis Preparation. 2011.
- **South African Malaria Initiative (SAMI): departmental bursary** for PhD studies at University of Cape Town; Value: ZAR.60, 000 p.a. Jul.2007.
- **DFG Germany Research Fellowship:** at the University of Nairobi, for MSc. Research expenses as a visiting student, May 2003.
- **African Canadian Continuing Education Society (ACCES) scholarship:** For 4th year undergraduate studies, at Kenyatta University, Academic year, to cover tuition and accommodation fees, 1996 – 1997.
- **Certificate of Merit:** African Fund for Endangered Species (AFEW's), Nature Conservation Essay competition, College Category, 1997.

MEMBERSHIP OF PROFESSIONAL & OTHER ORGANIZATIONS

1. **African Material Research Society**, BTRI, Gaborone, Botswana 2021-present.
2. **South African Chemical Institute** South Africa, membership No. 10962: 2012 to present
3. **International Society of Chelators and Metals**, Limassol, Cyprus: 2009 to 2012
4. **Teachers Service Commission (TSC)**, Kenya, Registered Teacher 389345: 1998 to present
5. **SENCER, USA** (Signature Initiative of the National Center for Science and Civic Engagements & Responsibilities) 2012- present
6. **African Network for Chemical Analysis of Pesticides (ANCAP):** 2003 to present.