

DR. VERONICA ACHIENG OKELLO

Machakos University

Department of Physical Sciences

P.O. Box 136-90100, Machakos, Kenya

Cellphone: +254 719 373483

Email: yokello@mksu.ac.ke veronicaokello@gmail.com

verohokello@yahoo.co.uk

RESEARCH INTEREST

1. Environmental Xenobiotics: Development of analytical methods and monitoring materials. Specifically, nanoscale and nano-enabled materials that offer new possibilities for the development of novel remediation and environmental sensing/monitoring technologies for water, soil and air pollutants. In addition to the general application of Green Chemistry such as bioremediation and phytoremediation technologies in solving day-to-day environmental and health problems.
2. Determination of medicinal potentiality of natural plants and the green nanoparticle synthesis processes, use of safe extraction procedures of flavonoids and their applications, nanotechnologies for stabilization of these extracts and application/modification of phase-inverted nano-porous membranes for environmental remediation and monitoring purposes.

UNIVERSITY EDUCATION

16th Aug 2013: PhD in Chemistry, State University of New York (SUNY) at Binghamton, USA.

Dissertation title: Naturally derived flavonoids and nanomembranes for environmental remediation and sensing.

25th July 2006: Master of Science (Chemistry), Jomo Kenyatta Uni. of Agriculture and Technology, Kenya

Thesis title: Spectroscopic study of textile dyes and their biodegradation using soil microorganisms

13th Oct 2000: Bachelor of Education Science (Second Class Honors Upper Division), Kenyatta Uni. Kenya

EMPLOYMENT

Feb 2015 - Present: Lecturer, Department of Physical Sciences, Machakos University (MksU), Kenya.

Aug 2014 - Jan 2015: Lecturer, Department of Pure and Applied Sciences, MMUST, Kenya

Aug 2008 - Aug 2013: Teaching Assistant, Department of Chemistry, SUNY Binghamton, USA.

2009 - 2023 (Summer): Research Assistant, Dr. O. A. Sadik's Lab, SUNY Binghamton, USA.

Jan 2007- Aug 2014: Assistant Lecturer, Department of Physical Sciences, MMUST, Kenya.

Sept 2006 - Dec 2006: Part Time Appointment, Western Uni. College of Sc. & Tech, Kenya.

Oct 2004 - Dec 2006: Assistant Lecturer, Kisumu Polytechnic, Kisumu, Kenya.

ADMINISTRATIVE DUTIES AND MEMBERSHIP OF COMMITTEES

Feb 2018 - Present: Director, Directorate of Quality Assurance, MksU.

July 2017- Feb 2018: Assistant Director, Directorate of Academic Quality Assurance, MksU.

Sep 2015 - Jul 2017: Coordinator, Academic Quality Assurance, Machakos University College.

Aug 2018 - Present: Chair, Public Complaints Committee.

Sept 2017 - August 2018: Chair, Quality Assurance Policy Committee.

July 2017- Present: Secretary, Board of Quality Assurance.

Sept 2014 - Feb 2015: Chair, Greening Initiative Committee, MMUST.

Jan 2014 - Feb 2015: Curriculum Development Team Leader, Analytical Chemistry Program, MMUST.

Aug 2014 - Present: Proposal Reviewer at NACOSTI, Kenya.

PUBLICATIONS

Book Chapters

- ISBN: 978-1-4557-3116-9

Nanotechnology Applications for Clean Water: Solutions for Improving Water Quality, 2nd Edition 2014. Edited by Anita Street, Richard Sustich, Jeremiah Duncan, Nora Savage:

Chapter 6: Nanostructured Membranes for Water Purification, Pg. 95-108.

Chapter 29: Green Remediation of Hexavalent Chromium Using Naturally Derived Flavonoids and Engineered Nanoparticles, Pg. 457-470.

Journal Publications

1. Kimosop, S. J., Orata, F., Shikuku, V. O., **Okello, V. A.**, and Getenga, Z. M., (2020). "Insights on adsorption of carbamazepine onto iron oxide modified diatomaceous earth: Kinetics, isotherms, thermodynamics, and mechanisms", *Environmental Research*, 180, 108898.
2. K'owino, I. O., **Okello, V. A.**, Masika, K., (2018). "Kinetics of Degradation of Metribuzin in aqueous solution using Zero Valent Iron Nanoparticles," *Journal of Al-Nahrain Journal of Science*, Vol 21, Issue 2, pp. 1-9. [DOI:10.22401/JNUS.21.2.01].
3. Kimosop, S. J., **Okello, V. A.**, Getenga, Z. M., Orata, F., and Shikuku, V. O., (2017). "Green Remediation of Carbamazepine from Water Using Novel Magnetic Iron Modified Carbonized Bagasse: Kinetics, Equilibrium and Mechanistic Studies, *Chemical Science International Journal*, Vol 8, Issue 3. pp 1 - 9. [DOI:10.9734/CSIJ/2017/32444].
4. Kimosop, S.J., Getenga, Z. M., Orata, F., and **Okello, V. A.**, (2016). "Residue Levels and Discharge Loads of Antibiotics in Wastewater Treatment Plants (WWTPs), Hospital Lagoons and Rivers within Lake Victoria Basin," *Environmental Monitoring and Assessment*, 188(9), pp. 532. [doi: 10.1007/s10661-016-5534-6].
5. Sifuna, F. W., and Orata F., **Okello V.**, and Kimosop S. J., (2016). "Comparative studies in electrochemical degradation of sulfamethoxazole and diclofenac in water using various electrodes," *Journal of Environmental and Health, Part A*, 51, 11, pp. 954 – 961.
6. **Okello, V. A.**, Osonga, J. F., Knipfing, M. T., Bushlyar, V., and Sadik, O. A., (2016). "Reactivity, characterization of reaction products and immobilization of lead in water and sediments using quercetin pentaphosphate," *Environ. Sci.: Processes Impacts*, 18, pp. 306.
7. **Okello, V. A.**, Gass, S., Pyrgiotakis, G., Du, N., Murdaugh, K., Deng, B., Demokritou, P., and Sadik, O. A., (2014). "Capture, Isolation and Electrochemical Detection of Industrially-relevant aerosol Nanoparticles using Poly(amic) acid, Phase inverted , Nanomembranes," *Journal of Hazardous Materials*, 279, pp. 365 - 374.
8. Noah, M. N., **Okello, V.**, Sun Z., and Sadik O.A., (2014). "An Instrumental Method Analysis Laboratory Experiment," *Journal of Chemical Education*, 91, (2), pp. 269-273.
9. Mwilu, S. K., **Okello, V. A.**, Miller, S., and Sadik, O., (2014). A Universal Substrate for Alkaline Phosphatase Based on Fluorescence, Absorbance and Electrochemical Techniques, *Analyst*, 139, pp. 5472-5481.
10. Yazgan, I., Du, N., Congdon, R., **Okello, V. A.**, and Sadik, O.A., (2014). "Biofunctionalized Poly(amic) Acid Membranes for Disinfection of Drinking Water," *Journal of Membrane Science*, 472, pp. 261-271.
11. Sadik, O.A., Du, N., Kariuki, V., **Okello, V. A.**, and Bushlyar V., (2014). "Current and Emerging Technologies for the Characterization of Nanomaterials," *ACS Sustainable Chem. Eng.*, 2, (7), pp. 1707–1716.
12. **Okello, V. A.**, Mwilu, S., Noah, N., Zhou, A., Chong, J., Knipfing, M. T., Doetschman, D., and Sadik, O. A., (2012). "Reduction of hexavalent chromium using naturally-derived flavonoids," *Environmental Science and Technology*, 46, pp. 10743–10751.
13. **Okello, V. A.**, Du, N., Deng, B., and Sadik, O. A., (2011). "Environmental Applications of Poly(amic)- based Nanomaterials, *Journal of Environmental Monitoring*," *Journal of Environmental Monitoring*, 13, pp. 1236 – 1245.
14. Kikandi, S. N., **Okello, V. A.**, Wang, Q., and Sadik, O. A., (2011). "Size-Exclusive Nanosensor for Quantitative Analysis of Fullerene C60, *Environmental Science and Technology*," 45, pp. 5294 – 5294.
15. Omole, M. A., **Okello, V. A.**, Lee, V., Zhou, L., and Sadik, O. A., (2011). "Catalytic Reduction of Hexavalent Chromium using Flexible Nanostructured Poly(amic) Acid," *ACS Catalysis*, 1, pp.139 – 146.

Conference Papers

1. **Veronica A. Okello**, Francis J. Osonga, Michael T. Knipfing, Victor Bushlyar and Omowunmi A. Sadik, A Spectroscopic Study: Quantitative Removal and In Situ Detection of Lead in Aqueous

Medium and Sediments Using Quercetin Pentaphosphate, African Journal of Mining, Entrepreneurship and Natural Resource Management (AJMENRM), ISSN: 2706-6002 Volume1, Issue 2 (April 2020):

Accepted.

2. **Okello V. A.**; Environmental Detoxification Using Polyamic Acid Powder and Nanomembranes, 2017. Manuscript Proceedings of the Exceed Swindon Expert Workshop “Sustainable Use of Water Resources” in Kisumu, Kenya, July 3-8, 2016. Pp. 61-68.
3. Kimosop S.A.; Getenga Z.; Orata F. and **Okello V. A.**, Quantification of selected antibiotics and their discharge loads in wastewater treatment plants and lagoons within lake Victoria basin, Kenya, 2017. Manuscript Proceedings of the Exceed Swindon Expert Workshop “Sustainable Use of Water Resources” in Kisumu, Kenya, July 3-8, 2016. pp. 23-32.

PRESENTATIONS AND INVITED LECTURES

1. Key note speaker, Emotional Intelligence – Relevance to SINGO Investment Limited, 13th July 2019, Hilton Garden Inn Hotel, Nairobi, Kenya
2. Participant, Organization for Women in Science for the Developing world (OWSD)- Kenya National Chapter Post Conference workshop, icipe, Duduville Campus, Kasarani, Kenya, 12th July 2019.
3. Guest Speaker and panelist. “Experimental Science in Africa: Support Systems in Kenya: A Personal Experience,” Young African Scientists in Europe (YASE) conference 6th July and EuroScience Open Forum 9th-14th July 2018. Toulouse, France.
4. Invited speaker, Environmental Detoxification Using Polyamic Acid Powder and Nanomembranes, 2017. Exceed Swindon Expert Workshop in Kisumu, Kenya, July 3-8, 2016.
5. Discussion Leader, Gordon Research Conference and Seminar on Green Chemistry, Barga, Lucca, Italy. July 21 – July 27, 2012.

CONFERENCE PRESENTATIONS

- Oral presentation; ‘A spectroscopic study: Quantitative removal and in situ detection of lead in aqueous medium and sediments using quercetin pentaphosphate,’ The 2nd Biennial CEMEREM Conference on “Sustainable Development in the Extractives Industry in Africa”, 16th-18th Sept 2019, Voi Wildlife Lodge, Voi, Kenya
- Oral presentation on ‘*Poly(amic) acid Nanomembranes for capture and detection of VENGENES generated nano-aerosols: Water and air purification*’, 2nd Annual International Conference, 24th -26th April 2019, Machakos University Hotel.
- Oral presentation on ‘*Chemical Safety and Security; Best Practices and Case Studies*’; Seminar on ‘*the Chemical Weapons Convention and Chemical Safety and Security Management for African Member States of the OPCW*’ Kampala, Uganda 27th -29th March, 2017.
- Oral presentation on ‘*Introducing Chemical Safety, Chemical Security and Chemical Weapons Convention into University Curriculum*’ Chemical Safety and Security Management for African Member State Conference, Nairobi, Kenya 5th -7th Sept 2016.
- Oral Presentation on ‘*Naturally Derived Flavonoids and Nanomembranes for Environmental Remediation*’, Experts Workshop on Sustainable Use of Water Resources, EXCEED 4TH – 7TH July, **2016**; Kisumu-Kenya.
- Oral Presentation on ‘*Introducing Chemical Safety, Chemical Security and Chemical Weapons Convention into University Curriculum*’, Organization for the Prohibition of Chemical Weapons (OPCW), Regional Meeting on Education and Outreach 13th - 14th June **2016**, Johannesburg South Africa.
- Oral presentation on ‘*Venges Synthesis, Capture & Electrochemical Detection of Industrially-relevant Engineered Nanoparticles*’, Kenya Chemical Society (KCS) 8th International Conference, Nairobi University, Chiromo Campus. May 5 - 8, **2015**.
- Poster presentation on ‘*Green nanoremediation of heavy metals*’, Pittcon, Pennsylvania Convention Center in Philadelphia, PA. March 17 – 21, **2013**.
- Poster Presentation on ‘*Removal of Hexavalent Chromium using Naturally-derived flavonoid’s*’, Gordon Research Conference and Seminar on Green Chemistry, Barga, Lucca, Italy. July 21 – July 27, **2012**.
- Oral/Poster presentation on ‘*Size-Exclusive Nanosensor for Quantitative Analysis of Fullerene C₆₀*’, Science to Technology Conference, SUNY Binghamton. March 11 – March 15, **2012**; Pittcon, Orlando, Florida. March 11 – March 15, **2012**; Gordon Research Conference on Environmental Nanotechnology, Waterville New Hampshire. May 29 – June 3, **2011**.

- Oral presentation on ‘*Environmental Remediation through Reduction of Hexavalent Chromium using Quercetin*’, Pittcon, Orlando, Florida. February 28 – March 5, **2011**.
- Poster Presentation on ‘*the detection of Silver(I) and Silver Nanoparticles using Carbon Paste Electrode Modified with Cystamine/6-(Ferrocenyl)hexanethiol*’, Pittcon, Atlanta, Georgia. March 13 – 18, **2011** and at Campus Wide Special Seminar, Binghamton University. October 1, **2010**.

SYNERGISTIC ACTIVITIES

- The Association of Commonwealth Universities (ACU) champion at MksU, April 2019 to date.
- Commission for University Education (CUE) Data Collection MksU Contact Person: Coordination of data collection and reporting on academic programs, staffing, student enrollment, research and collaborations, physical and academic facilities, student progression rates etc.
- Proposal Reviewer: NACOSTI, Nairobi Kenya, 2015-2018
- Session Chair: Machakos University 2nd Annual International Conference, Supporting Green Growth and Knowledge Economy Through Research, Innovation And Technology For Sustainable Development, Machakos, Kenya, 2019.
- Guest Speaker: Toulouse, France. Young African Scientists in Europe (YASE) conference 6th July and EuroScience Open Forum 9th-14th July 2018.
- Lead Trainer: Chemical Security training for University and College Staff within Machakos County, MksU Hotel, Koma Hall, 18th-20th July 2017; Chemical Security Best Practices for Unregulated Kariobangi Light Industries, Nairobi, Kenya 16th - 18th Dec. 2017.
- Serving Secretary/Member/Chair: to various committees within Machakos University: Member, Board of Post Graduate Studies; Secretary, Board Quality Assurance; Member, Environmental Management Committee; Member, University Senate; Member, University Board of Examinations among others.
- Discussion Leader: Gordon Research Conference and Seminar on Green Chemistry, Barga, Lucca, Italy. July 21st – 27th, 2012. https://www.binghamton.edu/chemistry/news/past_news.html

PROFESSIONAL AFFILIATIONS

- The Association of Commonwealth Universities, MksU Champion, April 2019 - To Date.
- Kenya Chemical Society, Member, 2015 - To Date
- Organization for Women in Science for the Developing World, Member, 2019 - To Date
- Royal Society of Chemists, Member, 2017 - To Date.
- American Chemical Society, Member, 2008 - 2014

WORKSHOPS & TRAININGS

- OWSD – Kenya National Chapter Post Conference Workshop, 12th July 2019: Topics Covered; Emotional intelligence, Referencing Software, icipe, Kasarani, Duduvile campus, Nairobi,
- Hands on training on grant proposal Writing, Facilitated by Prof. Zachary Getenga Ph.D, MksU and Prof. Benjamin Onyango. Ph.D., Missouri State University and visiting Professor on Carnegie Fellowship in Machakos University, 18th June 2019, MksU PL3.
- Workshop on Policy and Diplomacy for Scientists: Introduction to responsible research practices in chemical and biochemical sciences Policy on Diplomacy for Scientists Workshop, 12th – 15th Sept 2017, Adriatic Guesthouse (AGH), Kastler Lecture Hall Trieste, Italy.
- Train the trainer Workshop for the Unregulated Chemical Markets and Kariobangi Light Industries, 20th -22nd June 2017, Naivasha, Kenya.
- America Chemical Society (ACS) Global Chemists Code of Ethics Science & Technology Leadership Workshop: 15th -19th May 2017, The Tribe Hotel, Nairobi, Kenya.
- Job Analysis Training, PricewaterhouseCoopers, 21st -22nd Mar 2017, MksU Hotel, Kilimambogo Hall.
- Chemical Security Workshop for Kenyan and Somali Scientists, Technologists and Engineers, June 21-23, 2016, University of Nairobi (UoN), Department of Chemistry.
- Seminar on ‘the Chemical Weapons Convention and Chemical Safety and Security Management for African Member States of the OPCW’. 27th -29th Mar 2017, Kampala, Uganda.
- Reputable Chemical Supplier Workshop organized by Sandia International Laboratories, USA, Mar 21-24, 2016, Serena Beach Hotel, Mombasa, Kenya.
- Commission for University Education (CUE) Training Workshop on Data Collection and Management: 7th-8th October 2015 & 2nd-4th Dec 2015, ARC, Egerton University, Kenya.

- GC-MS Workshop on “a versatile analytical technique for mixture component Identification and Quantification”, Training on the use and maintenance of GC-MS. Aug 23-28, 2015, JKUAT, Kenya.
- Energy Trilogy workshop, 6 hours professional New York Energy smart student program, 28th Jan 2012, Binghamton, NY.

OTHER SKILLS AND COMPETENCE

- Analysis of environmental samples using GCMS, HPLC, NMR, FTIR, EPR, SEM, UV-Vis Spectrophotometer, E-beam and electrochemical methods and several other analytical techniques.
- Maintenance of GCMS instrument.
- Green synthesis of nanoparticles
- Chemical management using the Chemical Inventory Management System (CIMS)
- Champion of chemical safety and security processes at Machakos University.
- Competent in Microsoft office (Word, Excel, Powerpoint)
- Knowledge of ChemDraw and Referencing software,
- Good leadership skills, self-motivated, result oriented, and ability to work in a team

RESEARCH GRANTS, SCHOLARSHIPS AND RECOGNITIONS

- 2020: Carnegie African Diaspora Fellowship (CADF-cohort fellowship).
- 2019: Career feature in Nature Research Journal <https://www.nature.com/articles/d41586-019-02311-2>
- 2018: Green Laboratory Waste Management System **KSH. 65000**
- 2017: Chemical Security Program (CSP), Micro grants for training and Outreach activities, **USD 8390**
- 2017: Chemical Security and Training Grant, **USD 19,984**
- 2017: Chemical Security Improvement Grant, **USD 14,687.34**
- 2016: Seeding Labs Equipment Access 2016 Grant **USD 170,690.28 (IN-KIND)**
- 2013: Young Chemists Recognition at PITTCON Conference & Exposition held in Philadelphia, PA, March 17-22, 2013, Metrohm USA, Inc. Job offer at the City of Houston’s Public Works & Engineering, Wastewater Operations in Texas. www2.binghamton.edu/chemistry/news/
- Best poster presentation award; Center for Advanced Sensors and Environmental Systems, 2nd Annual Workshop on Environmental Nanotechnology.
- 2012: Sustainable Nanotechnology Organization (SNO) Student Award
- 2012: Discussion leader at one of the prestigious Gordon Research Seminar (GRS) sessions on Green Chemistry.
- Travel grant to attend the Prestigious Gordon Research Conference and Seminar on Green Chemistry held in Renaissance Tuscany II Ciocco Resort, Lucca (Barga), Italy.
- 2012: Graduate Student Award in Environmental Chemistry awarded by Division of Environmental Chemistry of the American Chemical Society.
- 2011: Travel grant to attend the inaugural Gordon Research Conference on Environmental Nanotechnology held in Waterville Valley Resort.
- 2010-2012: Summer Appointment awarded by the Research Foundation of New York.
- 2009: Summer Teaching Fellowship, Chemistry Department, SUNY Binghamton.
- 2008-2013: Research Assistant/Graduate Assistant/Teaching Assistant (RA/GA/TA) Fellowship, SUNY Binghamton.

SUPERVISION OF POSTGRADUATE AND UNDERGRADUATE STUDENTS

Postgraduates:

- 2019 - Present: Vincent Korir, MksU-MSc, “Phytoremediation of Selected Phthalates from Contaminated Water in Coastal Regions”.
- 2015 - 2018: Sally J. Kimosop, MMUST Dissertation: Green Based Technologies for Removal of Selected Pharmaceuticals from Aqueous Media and their Discharge Loads Within Lake Victoria Basin, Kenya.
- 2016 - 2018: Kevin Wekesa, MMUST–MSc. Thesis: Degradation of Organophosphate Paraoxon and Triazinone Metribuzin Using Zerovalent Iron Nanoparticles in Tropical Soils Within Nzoia River Drainage Basin, Kenya.

- 2015 - 2017: Fred Sifuna, MMSUT–MSc. Thesis: Levels of Selected Pharmaceuticals in Wastewater Treatment Plants within Lake Victoria Region of Kenya, and their Electrochemical Degradation.

Undergraduates:

- Michael, T Knipfing Fall 2009-2013 (Honors student), Jessica Adolarrato Fall 2012-Spring 2013, Victor Bushlyar, Fall 2012-Spring 2013, Abdoulaziz Toure, Mc Nair Scholar Program student, summer 2012, Orlando R. Villanueva, NIH BRIDGES to the Baccalaureate student, summer 2012, Danielle Schayek (BS Chemistry), Jane Chong (BS Chemistry), Kavita Sign (BS Chemistry).

Go Green innovative Projects:

- R. Wakabu, P. Kwamboka and F. Oduol; “Thermochromism: The science of magic cups”. Project has since been incorporated in MksU undergraduate Chemistry lab practicals.
- Fanuel O. Ooko, Innovation Project: Green Laboratory Waste Management System (prototype developed)

COMMUNITY SERVICE

- May 2018: Speaker at a STEM activity for High School Girls from Machakos County, Mksu.
- 2017: Participated in door-to-door training and raising awareness on chemical safety and security issues for Kariobangi small-scale Paint entrepreneurs.
- 2015 To Date: Coordinator and Founder of Go Green Machakos University Student Club: The club engages in mentorship programs to High School students and Primary School pupils, cleaning exercises, planting of trees, making low cost models for Organic Chemistry courses, among others.
- 2015 To Date: Chair and Founder of SINGO investment limited. A group of 12 women from different professional backgrounds. The group engages in mentorship projects to girls and boys especially in slum areas, personal development programs and several other community service projects.
- Material Science Nano Day 2013, Oakdale Mall, Binghamton, NY and Science Olympiad 2009, 2010, 2011 & 2012, SUNY Binghamton and Broome County Community College, NY.
- 2009-2010: Treasurer Graduate African Student Organization (GASO), SUNY Binghamton,
- 2009: Secretary- Graduate Chemistry Club (GCC), SUNY Binghamton.

GRADUATE RESEARCH

Environmental Nanoremediation Chemistry, which focused on environmental detoxification and development of sensors. We developed a sensor for the detection of fullerenes and engineered aerosols in the environment and reported the first evidence of the removal of Cr(VI) from environmental samples using a new water-soluble derivative of quercetin called quercetin pentaphosphate (QPP) and flexible poly(amic) acid (PAA); collaborated with Harvard School of Public Health on a project on capture and electrochemical detection of industrially relevant aerosols and microbes using phase-inverted PAA membrane.

REFEREES

1. Prof. Omowunmi A. Sadik
PhD Research Advisor
NJ Institute of Technology
323 Dr M.L.K. Jr. Blvd,
Newark, NJ 07102, USA
Tel: +1 973-596-2833
omowunmi.sadik@njit.edu

2. Ass. Prof. Maurice Odago
Department of Chem & Biochem
229 Physical Sciences Building
SUNY College of Oneonta,
Oneonta, NY 13820
Tel: +1 607-436-3480
maurice.odago@oneonta.edu

3. Prof. Zachary Getenga
Machakos University
P.O Box 136-90100
Machakos, Kenya
Phone : +254 729-171505
zgetenga@gmail.com