

DANIEL KALUKA, Ph.D.
ASSISTANT PROFESSOR OF CHEMISTRY

EDUCATION

Marquette University, Milwaukee, WI
Ph.D. Biophysical Chemistry **2012**
Dissertation: "Spectral Characterization of cytochromes P450 active site and catalytic intermediates."

Marquette University, Milwaukee, WI
M.S. Biophysical Chemistry **2009**
M.S. Thesis: "Resonance Raman Spectroscopy of Cytochrome P450cam"

University of Zimbabwe, Harare, Zimbabwe
B.S Honors Biochemistry **2003**

TEACHING EXPERIENCE

Taylor University, Upland, IN
Associate Professor of Chemistry **2022-present**
Assistant Professor of Chemistry **2019-2022**
Courses: Biochemistry I & II; College Chemistry II; General, Organic & Biochemistry I (lab) & II; Forensic Science; Environmental Pollution & Toxicology; Chemistry Thesis; Directed Research

Nyack College, Nyack, NY
Assistant Professor of Chemistry **2013-2019**
Courses taught (Lecture and Labs): General Chemistry I & II; Organic Chemistry I & II; Biochemistry, General, Organic & Biochemistry, Senior Seminar for Biology Majors

Marquette University, Milwaukee, WI
Teaching Assistant **2006-2012**
Courses taught: General Chemistry Labs
Met with students during office hours, graded all written work, including final exams.

University of Zimbabwe, Harare, Zimbabwe
Teaching Assistant **2004-2006**
Courses taught: Biochemistry Labs for medical students

RESEARCH EXPERIENCE

Taylor University **2019-present**
Undergraduate Research

- Currently working on the characterization of hemeproteins of the malaria parasite
- Design to data: Protein Structure-function studies in collaboration with UC Davis

Nyack College, Nyack, NY

Undergraduate Research

2015-2019

- As part of the HHMI SEAPHAGES program, Biochemistry students are introduced to authentic scientific research to characterize further mycobacteriophages discovered in their first-year Biology classes.
- Water quality and seining method optimization research in the Hudson River

Albert Einstein College of Medicine, Bronx, NY

Postdoctoral Fellow

2012 – 2013

Utilized Resonance Raman and UV-visible absorption spectroscopic techniques to probe structure-function relation in biologically important heme proteins such as cytochrome c oxidase.

Marquette University, Milwaukee, WI

Research Assistant

2006-2012

- Probed active site structure and substrate binding effects in heme proteins (*Biopolymers*, **2008**, 89(11), 1045-1053)
- Characterization of Cytochrome P450 reaction intermediates
- Routinely characterized products of organic synthesis reactions, including isotopically labeled derivatives of the heme prosthetic group using NMR
- Utilized multidimensional NMR in defining the active site architecture of drug-metabolizing enzymes
- Obtained high-purity heme protein samples using ion exchange and gel filtration column chromatography.
- Used Gas Chromatography-Mass Spectrometry (GCMS) to determine the purity of organic synthesis products
- Utilized *E. coli* cells in Heterologous expression of both native and isotopically labeled heme proteins

University of Zimbabwe

Research Assistant

2003-2006

- Defined antibody profiles in malaria and schistosomiasis exposed blood samples of Zimbabwean patients (*Malawi Medical Journal*, **2009** 21(4)176-181)

AWARDS

- Faculty Mentored Undergraduate Scholar Grant, 2023, 2022, and 2020
- Summer Research Grant Award, Nyack College, 2017
- Emerging Scholar of the Year, Nyack College, 2015
- First-Year Faculty Award, Nyack College, 2014
- Haymaker Scholarship Award for the best TA, Marquette University, 2010
- Rio Tinto Chemistry Prize for Best Student, University of Zimbabwe, 2001

BOOK CHAPTER REVIEWS

- Reviewed three chapters in the 3rd Edition of Miesfeld et al.'s Biochemistry textbook, W. W. and Norton Company (July 2023)
- Reviewed three chapters in the 7th Edition of Mckee's Biochemistry: The Molecular Basis of Life, Oxford University Press (July 2017)

PUBLICATIONS

- Usai, R., Kaluka, D., Cai, S., Sem, D. S., and Kincaid, J. R. (2023) Solution phase refinement of active site structure using 2D NMR and judiciously ¹³C-labeled Cytochrome P450. *J. Inorg. Biochem.* **241**, 112126.
- Usai, R., Kaluka, D., Mak, P. J., Liu, Y., and Kincaid, J. R. (2020) Resonance Raman spectroscopic studies of peroxy and hydroperoxy intermediates in lauric acid (LA)-bound cytochrome P450 119. *J. Inorg. Biochem.* **208**, 111084.
- Ahn, Y. O., Lee, H. J., Kaluka, D., Yeh, S.-R., Rousseau, D. L., Ädelroth, P., and Gennis, R. B. (2015) The two transmembrane helices of CcoP are sufficient for assembly of the cbb 3-type heme-copper oxygen reductase from *Vibrio cholerae*. *Biochim. et Biophys. Acta* **1847**, 1231–1239.
- Kaluka, D., Batabyal, D., Chiang, B.-Y., Poulos, T. L., and Yeh, S.-R. (2015) Spectroscopic and Mutagenesis Studies of Human PGRMC1. *Biochemistry* **54**, 1638–1647.
- Ahn, Y. O., Mahinthichaichan, P., Lee, H. J., Ouyang, H., Kaluka, D., Yeh, S.-R., Arjona, D., Rousseau, D. L., Tajkhorshid, E., and Ädelroth, P. (2014) Conformational coupling between the active site and residues within the KC-channel of the *Vibrio cholerae* cbb3-type (C-family) oxygen reductase. *Proc. Natl. Acad. Sci.* **111**, E4419–E4428.
- Kaluka, D., Kincaid, J.R. (2012) Spectral characterization of cytochromes P450 active site and catalytic intermediates. *Ph.D. dissertation* Marquette University.
- Kaluka, D.; Kincaid, J. R. (2009) Resonance Raman spectroscopy of cytochrome P450cam. *M.S. thesis*. Marquette University.
- Mduluzi, T., Mutapi, F., Ruwona, T., Kaluka, D., Midzi, N., and Ndhlovu, P. D. (2009) Similar cellular responses after treatment with either praziquantel or oxamniquine in *Schistosoma mansoni* infection. *Malawi Med. J. J. Med. Assoc. Malawi* **21**, 176–182.
- Mak, P. J., Kaluka, D., Manyumwa, M. E., Zhang, H., Deng, T., and Kincaid, J. R. (2008) Defining resonance Raman spectral responses to substrate binding by cytochrome P450 from *Pseudomonas putida*. *Biopolymers* **89**, 1045–1053.

STUDENT RESEARCH & PRESENTATIONS

- Asamoah, A., Zhang, D., and Gavilanez, D. Expression and Purification of *P. falciparum* Cytochrome b5-2. Undergraduate Research Conference, Buttler University, 2023
- Russell, K., Christian, E., Helmuth, A., and Watkins, T. Cloning, Expression, and Purification of Hemeproteins of *Plasmodium Falciparum*. Celebration of Scholarship, Taylor University 2021.
- Ponce Reyes, S., Park, P. J., Kaluka, D., and Washington, J. M. (2019) Complete Genome Sequence of *Rhodococcus erythropolis* Phage Shuman. *Microbiol. Resour. Announc.* (Stewart, F. J., Ed.) **8**, e00113-19.
- Sucely Ponce Reyes, Christal Rolling, Mariana Pereira Moraes, Maridalia Lillis, Maria I Paschalis, Grace K Anger, Marissa K Antonucci, Christina Dukehart, Rachel M Ewers, Kaelan Kanai, Franklin Mercado, Chelsea D Nichols, Ralph L Nicholson, Sofia M Osorio, Xylvie X Santiago, DJulie S Scaff, Kryscell N Stoner, Kathryn G Tamondong, Makayla Veracka, Daniel Kaluka, Peter J Park, Jacqueline M Washington, *Non-Mycobacterial Actinobacteriophages Expanding Our Knowledge of Phage Biology and Evolution, 10th Annual SEA-PHAGES Symposium, 2018*
- Ye Chan Sung, Maridalia Lillis, Daniel Kaluka, and Peter J. Park, Assessing Common Practices in Seining during Citizen Science Fish Counts: A Validation Study of Seining and Catch-Per-Unit-Effort, 50th Annual MACUB Conference, 2017
- Kuan Chiu, Ye Chan Sung, Emily E Barner, Zakary J Boilen, Manuel R Caguana, Katherine Oldfield, Constantino A Pardo, Hwa Soo Ryoo, Michael A Smith, Kristina L Walters, Daniel Kaluka, Wenbo Yan, Peter

J Park, Jacqueline M Washington, *Characterization of Saguaro, Founding Member of the New B7 Subcluster, 8th Annual SEA-PHAGES Symposium, 2016*

VOLUNTEER ACTIVITIES

- STEM Exploration Day at the Children's Museum of Indianapolis, September 30, 2023
- Chemistry Day at the Children's Museum of Indianapolis, November 2, 2019
- Annual Tri-county Science and Technology Fair Judge (<http://discoveryctr.org/tri-county-science-and-technology-fair/>), 2015-2018
- Poster presentation Judge at the MACUB 50th Annual conference held at NJCU, 2017
- Marriage Class Facilitators at Hawthorne Gospel Church, 2017-2018

MEMBERSHIPS

- American Chemical Society
- American Scientific Affiliate