

## **IRENE A OGUTU**

August 2022

### **Current Address:**

Regis University  
3333 Regis Blvd.,  
D4 Denver, CO 80221

e-mail: iogutu@regis.edu

### **Education**

Postdoctoral Research Fellow, Colorado School of Mines, 2019 to 2022

Ph.D. Marquette University, Chemistry, 2019

B.Ed\_Sc. The Catholic University of Eastern Africa, Chemistry and Biology, 2007

### **Honors and Awards**

American Chemical Society Award in Research at the American Chemical Society Rocky Mountain Regional Meeting, Fort Collins, CO, November 2020 Postdoctoral Research Presentation

Wisconsin province of the Society of Jesus Fellowship 2013/2014

Kenya Ministry of Education Scholarship 2007

Catholic Scholarship Program Award 2005 to 2007

### **Research Experience**

Postdoctoral Research Fellow, Colorado School of Mines, 2019 to 2022. Investigated the catalytic mechanism of nitrile hydratases under the mentorship of Prof. Richard C. Holz.

**Research Assistant**, Marquette University, May 2015 to December 2015, August 2016 to May 2017, January 2018 to August 2019; My thesis focused on understanding the catalytic mechanism of nitrile hydratases utilizing multiple techniques that include biochemical, molecular biology, kinetics, EPR spectroscopy, and X-ray crystallography.

**Undergraduate Research:** January to April 2007, Participated in a joint research project between the Kenya Medical Research Institute (KEMRI) and the Center for Traditional Medicine on phytochemical analysis and antimicrobial activity in *Phytolacca dodecandra*, *Cucumis aculeatus* and *Erythrina excelsa*.

### **Teaching Experience**

**A visiting Assistant Professor at Regis University:**

August 2022 to present

### **Teaching Assistant:**

Marquette University, August 2014 to May 2015, January 2016 to July 2016, May 2017 to December 2017; Taught General Chemistry Labs.

**High School teacher:**

St. Mary's Lwak Girls' High School, January 2012 to July 2013, Koru Girls' High School, September 2007 to December 2011; Taught Biology and Chemistry to Form 1 through Form 4.

**Experimental Methods and Techniques**

UV-Vis Spectroscopy

Gel electrophoresis

Protein expression, purification, and enzyme kinetics

Protein crystallography (X-ray and neutron diffraction)

Primer design and mutagenesis

Use of Electron Paramagnetic Resonance Spectroscopy (EPR)

MALDI-TOF Mass Spectroscopy

**Professional Affiliations**

American Chemical Society

American Society for Biochemistry and Molecular Biology

**Publications**

1. Ogutu, Irene A; Lilechi, Baraza D.\*; Mutai, Charles; Bii, Christine, "Phytochemical analysis and antimicrobial activity of *Phytolacca dodecandra*, *Cucumis aculeatus* and *Erythrina excelsa*" *Int. J. Biol. Chem. Sci.* **2012**, 6(2): 692-704
2. Ogutu, R.A.M. Irene; Holz\*, Richard C.; Bennett\*, Brian "Insight into the Maturation Process of the Nitrile Hydratases Active Site" *Inorg. Chem.*, **2021**, 60,8,5432-5435.
3. Ogutu, R.A.M. Irene; Martin St. Maurice; Bennett\*, Brian Holz\*, Richard C.; "Examination of the Catalytic Role of the Axial Cysteine Ligand in the Co-type Nitrile Hydratase from *Pseudonocardia thermophila* JCM 3095" *Catalysts.*, **2021**, 11(11) 1381
4. Ogutu, Irene; Lankathilaka, K.P. Wasantha; Liu, Dali; Bennett\*, Brian; Holz\*, Richard C. "The Active Site  $\alpha$ Thr162 Residues of Fe-type and Co-type Nitrile Hydratases are Catalytically Important" *to be submitted*.
5. Ogutu, Irene; Fielder\*, Adam T.; Bennett\*, Brian; Holz\*, Richard C. "A Peptide Nitrile Hydratase Active Site Model System: Insight into Co-Type NHase Active Site Maturation" *to be submitted*.
6. Ogutu, Irene; Mascarenhas, Romilla; Bennett, Brian; Liu\*, Dali; Holz\*, Richard C. "A Catalytically Competent Apo-Nitrile Hydratase" *to be submitted*.

**Presentations:**

1. Ogutu Irene, Salette Martinez, Wu Rui, Sanishvili Ruslan, Dali Liu, Richard C Holz\* “The Active Site Cysteine-Sulfenic Acid Ligand in Nitrile Hydratases Can Function as a Nucleophile” Neutrons in Structural Biology Workshop, Oak Ridge National Lab, Oak Ridge, TN June 2014: Poster presentation.
2. Ogutu Irene, Romilla Mascarnenhas, Dali Liu, Richard C Holz\* “Insight into the Role of the Proximal Thiolate Ligand During Catalysis in Nitrile Hydratases” 36<sup>th</sup> Midwest Enzyme Conference, University of Illinois at Chicago, Chicago, IL, October 1, 2016; Poster presentation.
3. Irene Ogutu, K.P. Wasantha Lankathilaka, Brian Bennett, Richard C Holz\* “Elucidating the Role of the Axial Cysteine Residue in NHase Catalysis and Enzyme Maturation” The Gordon Research Seminar (GRS) in Bioinorganic Chemistry, 2020, Ventura, California, USA, January 30, 2021; Poster and oral presentation.
4. Irene Ogutu, K.P. Wasantha Lankathilaka, Brian Bennett, Richard C Holz\* “Elucidating the Role of the Axial Cysteine Residue in NHase Catalysis and Enzyme Maturation” Experimental Biology 2020, American Society for Biochemistry and Molecular Biology, San Diego, California, USA, April 4, 2020; Poster presentation.
5. Irene Ogutu, K.P. Wasantha Lankathilaka, Brian Bennett, Richard C Holz\* “Elucidating the Role of the Axial Cysteine Residue in NHase Catalysis and Enzyme Maturation” Catalyst 2020, Denver, Colorado, USA, September 3, 2020; Poster presentation.
6. Irene Ogutu, K.P. Wasantha Lankathilaka, Brian Bennett, Richard C Holz\* “Elucidating the Role of the Axial Cysteine Residue in NHase Catalysis and Enzyme Maturation” American Chemical Society Rocky Mountain Regional Meeting, Fort Collins, CO, November 2020; oral presentation.
7. Irene Ogutu, Brian Bennett, Richard C Holz\* “Insight into the Maturation Process of the Nitrile Hydratase Active Site” Experimental Biology 2021, American Society for Biochemistry and Molecular Biology, April 2021; oral presentation.

**Undergraduate and Graduate Student Mentees:**

Boonyong, Kyle 1/2015 to 6/2015  
Florendo, Francesca 1/2015 to 6/2015  
Herrin, Synnöve 1/2020 to 5/2020  
Anderson, Taylor 1/2020 to 2021  
Sjahputera, Anastasia 5/2020 to 2021  
Alexander Luong 2/2022 to present  
Karla Deviesti 1/2020 to present  
Caroline Miller 9/2020 to present