

SERAPHINE KAMAYIRESE
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EDUCATION

PhD | Biomedical Sciences (Biochemistry)

Dec 2024

Creighton University, School of Medicine. Omaha, NE.

Dissertation Title: Design of Peptide Ligands for 14-3-3 ϵ , and Exploring the Role of Residue Types in Ligand Recognition by 14-3-3 Proteins

B.S | Biochemistry (Major), Community Health (Minor)

May 2019

Arizona State University, Barrett the Honors College. Tempe, AZ.

Summa cum Laude

Dean's list, all terms

PROFESSIONAL EXPERIENCE

Postdoctoral research scholar, Stanford University, Palo Alto, CA.

Feb 2025-present

- Designed and executed biophysical experiments to understand molecular mechanisms underlying interactions between the antimicrobial peptide LL-37 and amyloid peptides
- Synthesized, purified, and characterized antimicrobial/antiviral peptoids

Graduate Research Assistant, Creighton University, Omaha, NE, USA.

Aug 2019–Dec 2024

- Designed peptide inhibitors in silico, conducted structure–activity relationship studies, applied molecular dynamics simulations, and performed biophysical assays to evaluate binding to 14-3-3 ϵ and biological effects on cSCC cells.
- Synthesized and purified phosphopeptide candidates using reverse-phase HPLC, and optimized protein expression and purification protocols for recombinant 14-3-3 ϵ .
- Prepared presentations and posters, presented at conferences and seminars, and manuscripts for publication.

Undergraduate Research Assistant, Arizona State University. Tempe, AZ.

May 2017–Jul 2019

- Investigated expression levels of the fusogenic protein syncytin in macrophages, performed literature review, and synthesized findings into presentations for the research team.

Medical Laboratory Intern; Butaro Hospital. Burera, Rwanda.

June 2017–Aug 2017

- Assisted in medical examinations, data analysis, and patient record management across biochemistry, hematology, and pathology wards.

Teaching Assistant, Arizona State University.

May 2018–June 2029

- Instructed general chemistry labs (3 weekly sessions of 24 students), prepared lab materials, graded reports, managed records, ensured safety, and supported students' learning through office hours.

RESEARCH PROPOSALS AND GRANTS

Lead Researcher, Approved User Proposal, Lawrence Berkeley National Laboratory (LBNL)

- Secured access to LBNL's Molecular Foundry user facilities for a project to characterize complexes between the antimicrobial peptide LL-37 and amyloidogenic partners through advanced biophysical studies.

PUBLICATIONS

- **Kamayirese, S**, Sibaprasad Maity, Lynne M. Dieckman, Laura A. Hansen, and Sándor Lovas. Optimizing Phosphopeptide Structures That Target 14-3-3 ϵ in Cutaneous Squamous Cell Carcinoma. *ACS Omega* **2024**, 9 (2), 2719-2729.
- **Kamayirese, S.**; Maity, S.; Hansen, L.A.; Lovas, S. The Development of CDC25A-Derived Phosphoserine Peptides That Bind 14-3-3 ϵ with High Affinities. *Int. J. Mol. Sci.* **2024**, 25, 4918, doi:10.3390/ijms25094918.
- **Kamayirese, S.**; Hansen, L.A.; Lovas, S. Negative Charges, Not Necessary Phosphorylation, Are Required for Ligand Recognition by 14-3-3 Proteins. *FEBS Lett.* **2025**, 599, 838-847
- Blaney, E.; Demeke M.; **Kamayirese, S.**; Monga, L.; Hansen, L. A.; Watts, C. R.; Lovas, S. Does chlorotoxin target matrix metalloproteinase-2 in 5 glioblastoma? *PLOS One*. Under review.

PRESENTATIONS

Oral presentations

- **Kamayirese S**, Maity S, Hansen LA, Lovas S. *CDC25A-derived peptides bind 14-3-3 ϵ with high affinities*. Midwest Students Biomedical Research Forum, Omaha, NE. March 2024.
- **Kamayirese S**, Maity S, Hansen LA, Lovas S. *Optimization of Peptide Inhibitors of 14-3-3 ϵ Interactions With CDC25A*. Department of Biomedical Sciences Seminar. Creighton University, Omaha, NE. June 2022.
- **Kamayirese S**, Maity S, Hansen LA, Lovas S. *Designing Peptide Inhibitors of 14-3-3 ϵ Interactions With CDC25A in Cutaneous Squamous Cell Carcinoma*. Creighton University Research Week. Omaha, NE. March 2021.

Poster Presentations

- * **Kamayirese S**, Maity S, Hansen LA, Lovas S. *CDC25A-derived peptides bind 14-3-3 ϵ with high affinities*. **Gordon Research Conference**. Ventura, CA. February 2024.
- * **Kamayirese S**, Maity S, Hansen LA, Lovas S. *Optimizing peptide Structures That Target 14-3-3 ϵ in Cutaneous Squamous Cell Carcinoma*. **American Peptide Symposium**. Scottsdale, AZ. June 2023.
- **Kamayirese S**, Maity S, Hansen LA, Lovas S. *Optimizing Peptide Structures That Target 14-3-3 ϵ in Cutaneous Squamous Cell Carcinoma*. Midwest Students Biomedical Research Forum. Omaha, NE. March 2023.
- **Kamayirese S**, Maity S, Hansen LA, Lovas S. *Optimizing Peptide Structures That Target 14-3-3 ϵ in Cutaneous Squamous Cell Carcinoma*. Creighton University Research Week. Omaha, NE. April 2023.

- **Kamayirese S, Maity S, Hansen LA, Lovas S.** *Optimization of Peptide Inhibitors of 14-3-3ε Interactions With CDC25A.* Midwest Students Biomedical Research Forum. Omaha, NE. March 2022.
- **Kamayirese S, Maity S, Hansen LA, Lovas S.** *Optimization of Peptide Inhibitors of 14-3-3ε Interactions With CDC25A.* Creighton University Research Week. Omaha, NE. April 2022.

*, international conferences.

AWARDS AND HONORS

- **The Dr. Elizabeth A. Schram Award** for the 2023 Young Investigator Poster Competition at the 28th American Peptide Symposium. American Peptide Society. 2023.
- **The 28th American Peptide Symposium travel award.** American Peptide Society. 2023
- **Graduate Student Government travel award** to attend the Gordon Research Conference. Creighton University graduate school. 2024.
- **Graduate Student Government travel award** to attend the American Peptide Symposium. Creighton University graduate school. 2023.
- **MasterCard Foundation Scholarship** for proven academic achievement and active engagement in community leadership. Mastercard Foundation. 2015-2019.

HONORS AND SOCIETY MEMBERSHIPS

- American Chemical Society
- American Peptide Society

COMMUNITY INVOLVEMENTS

- **Solutions Committee Coordinator.** ChangeMaker Central, ASU. Tempe, AZ. 2017-2019
- **Volunteer.** Tempe St. Luke's Hospital. Tempe, AZ. 2017 -2019
- **Member.** Global Guide Program at ASU. Tempe, AZ. 2016-2019
- **Member,** African Students' Association at ASU. Tempe, AZ. 2016-2019