BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. DO NOT EXCEED FIVE PAGES.

NAME: Kamayirese, Seraphine, Ph.D.

eRA COMMONS USERNAME (credential, e.g., agency login): SKAMAYIRESE

POSITION TITLE: Postdoctoral scholar

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE	COMPLETION DATE	FIELD OF STUDY
Arizona State University, Tempe, Arizona	BS *summa sum laude*	05/2019	Biochemistry
Creighton University, Omaha, Nebraska	PhD	12/2025	Biomedical Sciences
Stanford University, Stanford, California	Postdoc	present	

A. Personal Statement

I am a protein and peptide biochemist with a focus on biophysical characterization, structural activity relationship (SAR)study, and design and optimization of peptides targeting disease-relevant proteins. My Ph.D. research focused on designing and optimizing ligands that target the 14-3-3ε protein to disrupt its interaction with the cell cycle regulator CDC25A, an interaction known to suppress apoptosis in squamous cell carcinoma. Inhibiting this pathway is expected to promote apoptosis in cutaneous squamous cell carcinoma. At Stanford University, I am expanding my research to study antimicrobial peptidoids and peptides such as LL-37 and their interactions with amyloid beta peptides, and the potential application of the resulting complexes as antiviral therapeutics. I bring strong experience in rational peptide design, structural activity relationship studies, molecular dynamics simulations, peptides and peptoids synthesis and purification, protein expression, and biophysical assays. My research has led to multiple peer-reviewed publications, presentations at national and international conferences, and awards, including the Young Investigator Poster Award at the American Peptide Symposium.

B. Positions and Honors

Positions and Scientific Appointments

2025 - Postdoctoral scholar, Stanford University, Department of Bioengineering. Mentor: Annelise Barron. Project focus: *Molecular Mechanism and Antiviral Potential of Host Defense Complexes Between LL-37 and Aβ peptides*.

2019 - 2024 Research assistant, Creighton University, Department of Biomedical Sciences, School of Medicine. Mentor: Sandor Lovas. Project focus**:** *Design of peptide ligands for 14-3-3ε, and exploring the role of residue types in ligand recognition by 14-3-3 proteins.*

2018 - 2019 Teaching assistant, Arizona State University, Department of Chemistry and Biochemistry. Course. *General Chemistry Lab.*

2017 - 2019 Research Assistant, Arizona State University, Department of Biomedical Sciences. Mentor: Tatiana Ugarova. Project focus: *Expression of the Fusogenic Protein Syncytin in Macrophages.*

2017 - 2017 Medical Laboratory Intern, Butaro Hospital, Burera, Rwanda

Honors

June 2025 Awarded a competitive user proposal at the Molecular Foundry, Lawrence Berkeley National Laboratory, granting access to advanced research facilities.

2024 - 2024 Graduate Student Government Travel Award, Creighton University

2023 - 2023 2023 Dr. Elizabeth A. Schram Award, Young Investigator Poster Competition award, American Peptide Society

2023 - 2023 Travel Award, American Peptide Society

2023 - 2023 Graduate Student Government Travel Award, Creighton University

2019 - 2019 Honors Medal, Barrett the Honors College, Arizona State University

2015 - 2019 MasterCard Foundation Scholarship, Mastercard Foundation

C. Contribution to Science

Design of Peptide Inhibitors Targeting 14-3-3ε in Cutaneous Squamous Cell Carcinoma (cSCC) My doctoral work centered on designing peptide inhibitors of protein–protein interactions between 14-3-3ε and CDC25A. Through in silico design, molecular dynamics simulations, and peptide synthesis, I optimized the binding affinity 6.5-fold. This work demonstrated that negative charges can substitute for phosphorylation in ligand recognition by 14-3-3 proteins, leading to novel mechanistic insights.

Publications:

a. Seraphine Kamayirese, Laura A. Hansen, Sándor Lovas. Ligand recognition by 14-3-3 proteins requires negative charges but not necessarily phosphorylation. *FEBS Letters*. 2025 March. DOI: 10.1002/1873-3468.15077

b. Seraphine Kamayirese, Sibaprasad Maity, Lynne M. Dieckman, Laura A. Hansen, Sándor Lovas. Optimizing Phosphopeptide Structures That Target 14-3-3ε in Cutaneous Squamous Cell Carcinoma. *ACS Omega*. 2024 January. DOI: 10.1021/acsomega.3c07740

c. Seraphine Kamayirese, Sibaprasad Maity, Laura A. Hansen, Sándor Lovas. The Development of CDC25A-Derived Phosphoseryl Peptides That Bind 14-3-3ε with High Affinities. *International Journal of Molecular Sciences*. 2024 April. DOI: 10.3390/ijms25094918

d. Does chlorotoxin target matrix metalloproteinase-2 in glioblastoma? *PLOS One*. Under review.

D. Scholastic Performance

YEAR	COURSE TITLE	GRADE
	CREIGHTON UNIVERSITY	
2019	Responsible Conduct of Research	SA
2020	Biochemistry, Molecular and Cell Biology	A
2020	Research Methods	P
2021	Directed Independent Study (Protein Biochemistry)	A
2021	Introduction to Biostatistics for the Biomedical sciences	A
2023	Directed Independent Research	A

Creighton University's graduate grading system uses letter grades, with some exceptions graded with SA (satisfactory) and P(pass).