Nischal Karki

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EDUCATION		
Southern Methodist University, Dallas,	тх	Expected Aug 2023
Ph.D. Candidate in Chemistry		_
Synopsis Topic: Photochemistry of Flavin Binding Blue-Light Receptors: LOVs and CRY		
Proposal Topic: Delineating the Regulation of Fat Metabolism by the Circadian and		
Photoperiodic Rhythm		
University of Southern Mississippi, Hatt	tiesburg, MS	Aug 2013 – Dec 2016
B.S. in Biochemistry, minors in Mathematics and Biology		
Thesis: The Role of Lys phosphatidylcholine Acyltransferase1/ 2 in the Acyl-Editing Cycle in Leaf Tissues		yl-Editing Cycle in
William Carey University, Hattiesburg, MS		Aug 2012 – May 2015
Major in Biology and Chemistry, GPA: 3.8		
Transferred to University of Southern Miss	issippi	
PROFESSIONAL EXPERIENCE		
Southern Methodist University		
Research Assistant, Supervisor: Dr. Brian Zoltowski		Aug 2017– Present
 Kinetics of Photoreceptors in Circadian R 	Regulation	
 Structural Analysis of Allosteric Regulation 	ns	
Experimental Designs for Spectroscopic and Photometric Analysis		
 Molecular Dynamics and Computer-Aide 	d Drug Discovery	
University of Southern Mississippi		
Research Assistant, Supervisor: Dr. Philip D. Bates		Oct 2013 – July 2017
Lipid Metabolism		
Seed oil characterization		
William Carey University		
Tutor		Jan 2013 – Apr 2013
 Provide academic assistance to fellow st 	udents in Physics and Chemist	ry
Skills		
Recombinant Protein Expression	Structure -Function Analysis	
Protein Purification from E. Coli	Mathematical Modelling	
UV/Vis Spectroscopy	Proficient in Programming	
Flavin Chemistry in Flavoproteins	Molecular Dynamics	
Kinetic Analysis	Computer Aided Drug Desig	า

PUBLICATIONS

- 1. Zhao T, **Karki N**, Zoltowski B, Matthews D, 2022. Allosteric regulation in STAT3 interdomains is mediated by a rigid core: SH2 domain regulation by CCD in D170A variant. PLoS Comput Biol 18(12): e1010794
- 2. Trozzi F, **Karki N**, Song Z, Verma N, Kraka E, Zoltowski BD, Tao P, 2022. Allosteric control of ACE2 peptidase domain dynamics. Organic & Biomolecular Chemistry, Volume 20, p. 3605–3618.
- 3. Karki N, Vergish S, Zoltowski D, 2021. Cryptochromes: photochemical and structural insight into magnetoreception. Protein Science, Volume 30, p. 1521–1534.
- Karki N*, Verma N*, Trozzi F*, Tao P, Kraka E, Zoltowski B, 2021. Predicting Potential SARS-COV-2 Drugs—In Depth Drug Database Screening Using Deep Neural Network Framework SSnet, Classical Virtual Screening and Docking. International journal of molecular sciences, Volume 22, p. 1573.
- Verma N, Qu X, Trozzi F, Elsaied M, Karki N, Tao Y, Zoltowski B, Larson EC, Kraka E., 2021. Ssnet: A deep learning approach for protein-ligand interaction prediction. International journal of molecular sciences, Volume 22, p. 1392.
- Pudasaini A, Green R, Song Y, Blumenfeld A, Karki N, Imaizumi Takato, Zoltowski B, 2020. Steric and electronic interactions at GIn154 in ZEITLUPE induce reorganization of the LOV domain dimer interface. Biochemistry, Volume 60, p. 95–103.
- Zoltowski B, Chelliah Y, Wickramaratne A, Jarocha L, Karki N, Xu W, Mouritsen H, Hore P, Hibbs R, Green C, Takahashi J, 2019. Chemical and structural analysis of a photoactive vertebrate cryptochrome from pigeon. Proceedings of the National Academy of Sciences, Volume 116, p. 19449–19457.
- Karki N, Johnson B, Bates P, 2019. Metabolically distinct pools of phosphatidylcholine are involved in trafficking of fatty acids out of and into the chloroplast for membrane production. The Plant Cell, Volume 31, p. 2768–2788.
- 9. **Karki N**, Bates P, 2018. The effect of light conditions on interpreting oil composition engineering in Arabidopsis seeds. Plant Direct, Volume 2, p. e00067.

PRESENTATIONS

- 1. **Karki N**, "Elucidating Radical Pair Mechanisms Responsible for CRY Magnetoreception" **poster presentation** at the Gordon Research Conference in Ventura, Ca, Mar 2022.
- 2. *Karki N*, "Molecular Basis and Physiology of Photoreceptor Proteins" **Discussion Leader** at the Gordon Research Conference in Ventura, Ca, Mar 2022.
- 3. *Karki N*, "From Model to Animal Behavior: Understanding Magnetoreception in Biology" **oral presentation** in Three Minute Thesis at Southern Methodist University, Nov 2022.
- 4. *Karki N,* "LOV of Blue Light in Biology" oral presentation in the 51st American Chemical Society Dallas-Fort Worth Meeting in Miniature, Dallas, TX, Apr 2018.
- Karki N, "Acyl Editing in Leaves: Fatty Acid Modification in Leaf Tissues" oral presentation in Undergraduate Symposium on Research and Creative Activity at University of Southern Mississippi, Apr 2016.
- Karki N, "In Vivo Analysis of the Gene Products Responsible for Polyunsaturated Fatty Acid Flux into Seed Oils" poster presentation in Undergraduate Symposium on Research and Creative Activity at University of Southern Mississippi, Apr 2015.
- Karki N, "In Vivo Analysis of the Gene Products Responsible for Polyunsaturated Fatty Acid Flux into Seed Oils" poster presentation in American Society for Plant Biologists Annual Meeting (Southern Section), Mar 2015.
- 8. *Karki N,* "Understanding Metabolic Pathway of Unsaturated Oil Synthesis" oral presentation in the Summer Research Experience for Undergraduates Seminar at University of Southern Mississippi, Aug 2014.

WORKSHOPS ATTENDED

NVIDIA: Fundamentals of Deep Learning for Multi-GPUs

Southern Methodist University, Oct 2022

Used Horovod to scale a model running on a single GPU to multiple GPUs

NVIDIA DLI – Accelerating Data Engineering Pipelines

Southern Methodist University, Oct 2022

Manipulated large sets of data quickly using tools like cuDF, Dask, and NVTabular

AWARDS AND HONORS

University of Southern Mississippi

Eagle Scholars Program for Undergraduate Research (Eagle SPUR), 2014

LANGUAGES

English, Fluent Nepali, Native