CURRICULUM VITAE-Career highlights

Shahid Karim- School of Biological, Environmental, and Earth Sciences, The University of Southern Mississippi, Hattiesburg, MS 39406. Phone: 601-266-6232, E-mail: Shahid.Karim@usm.edu

Education

1999 Ph.D., Molecular Biology, University of the Punjab, Lahore, Pakistan
1990 M.S., Zoology, University of the Punjab, Lahore, Pakistan
1986 B.S. Biology. University of the Punjab, Lahore, Pakistan

Research Experience

2017-present	Professor, University of Southern Mississippi, Hattiesburg, MS
2014-2023	Director, MS-INBRE Bioinformatics Core, University of Southern Mississippi
2012-2017	Associate Professor, University of Southern Mississippi, Hattiesburg, MS
2008-2012	Assistant Professor, University of Southern Mississippi, Hattiesburg, MS
2006-2008	Assistant Research Professor, University of Rhode Island, Kingston, RI
2002-2006	Research Fellow, University of Rhode Island, Kingston, RI
2000-2002	Postdoctoral Fellow, Oklahoma State University, Stillwater, OK

Research Highlights

1. Published/submitted manuscripts: >100 primary articles and 5 reviews/chapters
2. Author of over 300 scientific presentations
3. Citation metrics (Google Scholar) Citations = 2963, h-index = 31, i10-index = 59
4. Bestowed more than 20 awards and honors since 2008
5. PI or Co-PI on 30 external grants totaling over $44 million

Teaching Highlights

1. Developed and expanded undergraduate courses on bioinformatics, medical entomology, parasitology, and molecular biology
2. Instructor for three international courses on vector biology
3. Director and lead instructor for the bioinformatics program

USM Student and postdoc Mentorship Highlights

Graduated: 11 Honors, 10 MS in Biological Sciences, 6 Ph.D. in Biological Sciences
Visiting scholars: 5, and postdoctoral fellows: 6

Service Highlights

1. Reviewer for more than three dozen scientific journals and over 200 individual manuscripts
2. Grant panel members: American Heart Association, NIH NIAID, NSF, Czech Science Foundation, USDA, DoD Ticks and Tick-Borne Diseases Program
3. Award Panels: Entomological Society of America, University Award Committee, College Award Committee.
4. Editorial Boards: Frontiers in Cellular and Infection Biology, Insect Molecular Biology, Insects, Frontiers in Allergy, and Frontiers in Veterinary Sciences
5. Member: Faculty Senate (2019-2022)

FULL CURRICULUM VITAE

Shahid Karim
The University of Southern Mississippi
School of Biological, Environmental, and Earth Sciences
Center for Molecular and Cellular Biosciences
118 College Drive, 5018, Hattiesburg, MS 39406
Office: 601-266-6232
Cell: 601-432-2131
E-mail: Shahid.Karim@usm.edu

EDUCATION AND EXPERIENCE

Education:

- Ph.D. Molecular Biology. National Centre of Excellence in Molecular Biology, University of the Punjab, Lahore, Pakistan (08/1999)
    - Advisor: Dr. Sheikh Riazuddin
- M.S. Zoology. Department of Zoology, University of the Punjab, Lahore, Pakistan (08/1990)
    - Advisor: Dr. Firdusia Azam Ali
- B.S. Biological Sciences. University of the Punjab, Lahore, Pakistan (08/1986)

Research Positions:

- Assistant Research Professor. Entomology and Plant Sciences, University of Rhode Island, Kingston, RI. 2006-2008.
    - RNA interference to study the role of exocytosis in tick-borne pathogen transmission
    - Advisor: Dr. Thomas N. Mather
- Research Fellow. Center for Vector-Borne Disease, Entomology and Plant Sciences, University of Rhode Island, Kingston, RI. 2002-2006
    - Development of an anti-tick vaccine
    - Advisor: Dr. Thomas N. Mather
- Postdoctoral associate. Entomology and Plant Pathology. Oklahoma State University, Stillwater, OK. 2000-2002.
    - Identification and characterization of SNARE proteins in tick salivary glands
    - Advisor: Dr. John R. Sauer
- Research Officer. Centre of Excellence in Molecular Biology, University of the Punjab, Lahore, Pakistan. 1997-1999.
    - Molecular characterization of new and novel Bacillus thuringiensis toxins against lepidopteran insect pests
    - Advisor: Dr. Sheikh Riazuddin

- Predoctoral Fellow. Department of Biochemistry, The Ohio State University, Columbus, OH. 1995-1996.
    - Characterization of Bt toxin and their interactions with the insect midgut receptors
    - Advisor: Dr. Donald H. Dean
- Graduate Research Assistant. Centre of Excellence in Molecular Biology, University of the Punjab, Lahore, Pakistan. 1990-1995.
    - Identification and characterization of novel Bt toxins against lepidopteran insect pests
    - Advisor: Dr. Sheikh Riazuddin

Academic Positions:

- 2017- present. Professor. Cell and Molecular Biology, University of Southern Mississippi. School of Biological, Environmental, and Earth Sciences. Hattiesburg, MS.
- 2014-2023. Director, MS-INBRE Bioinformatics Core, University of Southern Mississippi, Hattiesburg, MS.
- 2014-present. Faculty Affiliate. Center for Undergraduate Research, University of Southern Mississippi, Hattiesburg, MS.
- 2012-2017. Associate Professor (Tenured). Biological Sciences. University of Southern Mississippi, Hattiesburg, MS.
- 2008-2012. Assistant Professor, Biological Sciences. University of Southern Mississippi, Hattiesburg, MS.

PROFESSIONAL STATURE AND RECOGNITION

Awards and Honors:

- 2023. PBT-ESA Recognition Award in Physiology, Biochemistry, and Toxicology, Entomological Society of America- [$1500.00]
- 2023. SEB-ESA Recognition Award in Physiology, Biochemistry, and Toxicology, Southeastern Branch Entomological Society of America
- 2022. Selected for the Faculty Leadership Program. Faculty Leadership Institute, University of Southern Mississippi, Hattiesburg, MS.
- 2022. Aubrey Keith Lucas and Ella Ginn Lucas Endowment for Faculty Excellence award (University of Southern Mississippi)- [$5000.00], Hattiesburg, MS.
- 2019. Aubrey Keith Lucas and Ella Ginn Lucas Endowment for Faculty Excellence award, University of Southern Mississippi-[$5000.00], Hattiesburg, MS.
- 2018. Mississippi Entomological Association's Distinguished Service Award. Mississippi State, MS.
- 2018. The University Research Council's Innovation Award for Basic Research (University of Southern Mississippi). Hattiesburg, MS.
- 2017. Aubrey Keith Lucas and Ella Ginn Lucas Endowment for Faculty Excellence award (University of Southern Mississippi)-[$4600.00], Hattiesburg, MS.

- 2016. Vice President of Research Proposal Development Award (The University of Southern Mississippi)- [$2000.00], Hattiesburg, MS.
- 2015. Aubrey Keith Lucas and Ella Ginn Lucas Endowment for Faculty Excellence award (University of Southern Mississippi)- [$5000.00], Hattiesburg, MS.
- 2014. Vice President of Research Proposal Development Award (The University of Southern Mississippi)- [$2000.00], Hattiesburg, MS.
- 2014. The QEP Topic Selection proposal award (The University of Southern Mississippi)- [$1400.00- a team award for Golden Opportunity for active learning], Hattiesburg, MS.
- 2011. Finding a Voice: Improving Oral and Written Competencies, USM QEP Speaking and Writing Pedagogy fellowship [$1500.00], Hattiesburg, MS.
- 2010. Office of Naval Research/American Society of Engineering Education Summer Faculty Research Award [$30,000] to conduct rickettsial research at Naval Medical Research Center, Silver Spring, Maryland.
- 2009. Aubrey Keith Lucas and Ella Ginn Lucas Endowment for Faculty Excellence award (University of Southern Mississippi)- [$5000.00], Hattiesburg, MS.
- 2009. Academic Service-Learning Faculty Fellow, Office of Community Service Learning, the University of Southern Mississippi-[$1500.00]. Hattiesburg, MS.
- 2007. Research Ethics Fellow, University of Rhode Island Research Ethics Fellows Program
- 2007. John Hazen White Sr. Ethics and Public Policy Faculty Fellow award, University of Rhode Island- [$3000.00]
- 2003. Best poster Award, Gordon Research Conference, Salivary glands and exocrine secretion, Ventura, California.
- 1997. Excellence in Research award, National Centre of Excellence in Molecular Biology, Pakistan
- 1995. Rockefeller Foundation pre-doctoral fellowship (1995-1996) for study at the Ohio State University ($55,000). Dr. Donald H. Dean-(Mentor)
- 1994. UNESCO Short-term Biotechnology fellowship for training at the International Rice Research Institute, Philippines- [$5000]

Board Member/Editor:

- 2022-present. Frontiers in Cellular and Infection Microbiology (Parasite and Host). Associate Editor.
- 2021-present. Insect Molecular Biology. Editor for Review Section
- 2021-present. Insects. Editorial board member.
- 2022-present. Frontiers in Veterinary Science (Parasitology), Review Editor
- 2022-present. Frontiers in Allergy (Infections and Microbiome), Review Editor

Professional Memberships:

- 2000-present. Entomological Society of America
- 2008-present. The American Society of Tropical Medicine and Hygiene
- 2007-present. American Heart Association
- 2008-present. Acarological Society of America

- 2008-present. Mississippi Academy of Sciences
- 2008-present. Mississippi Entomological Association (ESA)

RESEARCH ACTIVITY

Referred Journal Articles:
Complete List of Published Work in My Bibliography:
https://www.ncbi.nlm.nih.gov/myncbi/shahid.karim.2/bibliography/public/

Published

1. Sharma SR, Choudhary SK, Vorobiov J, Commins SP, **Karim S**. Tick bite-induced alpha-gal syndrome and immunologic responses in an alpha-gal deficient murine model. Front Immunol. 2024 Feb 8;14:1336883. doi: 10.3389/fimmu.2023.1336883. PMID: 38390396; PMCID: PMC10882631. [Journal IF: 8.786]
2. Adegoke A, Ribeiro JMC, Smith RC, **Karim S**. Tick innate immune responses to hematophagy and *Ehrlichia* infection at single-cell resolution. Front Immunol. 2024 Jan 11;14:1305976. doi: 10.3389/fimmu.2023.1305976. PMID: 38274813; PMCID: PMC10808623. [Journal IF: 8.786]
3. Adegoke A, Hanson J, Smith RC, **Karim S.** *Ehrlichia chaffe*ensis Co-Opts Phagocytic Hemocytes for Systemic Dissemination in the Lone Star Tick, Amblyomma americanum. J Innate Immun. 2024;16(1):66-79. doi: 10.1159/000535986. Epub 2023 Dec 22. PMID: 38142680; PMCID: PMC10794049. [Journal IF: 7.111]
4. **Karim S**, Leyva-Castillo JM, Narasimhan S. Tick salivary glycans - a sugar-coated tick bite. Trends Parasitol. 2023 Dec;39(12):1100-1113. doi: 10.1016/j.pt.2023.09.012. Epub 2023 Oct 12. PMID: 37838514. [Journal IF: 9.6]
5. Tahir F, Goblirsch M, Adamczyk J, **Karim S,** Alburaki M. Honey bee Apis mellifera L. Responses to Oxidative Stress Induced by Pharmacological and Pesticide Compounds. [preprint]. 2023 August. Available from: doi: https://doi.org/10.1101/2023.08.11.553037.

1. **Karim S,** Zenzal TJ Jr, Beati L, Sen R, Adegoke A, Kumar D, Downs LP, Keko M, Nussbaum A, Becker DJ, Moore FR. Ticks without borders: Microbial communities of immature Neotropical tick species parasitizing migratory landbirds along northern Gulf of Mexico. bioRxiv [Preprint]. 2023 Oct 24:2023.10.22.563347. doi: 10.1101/2023.10.22.563347. PMID: 37961388; PMCID: PMC10634713. *(*Pending in Microbiome). [Journal IF: 15.5]
6. Sampson B, Gregorc A, Alburaki M, Werle C, **Karim S**, Adamczyk J, Knight P. Sensitivity to imidacloprid insecticide varies among some social and solitary bee species of agricultural value. PLoS One. 2023 May 3;18(5):e0285167. doi: 10.1371/journal.pone.0285167. PMID: 37134100; PMCID: PMC10155993. [Journal IF: 3.7]
7. Adegoke A, Ribeiro JMC, Brown S, Smith RC, **Karim S.** *Rickettsia parkeri* hijacks tick hemocytes to manipulate cellular and humoral transcriptional responses. Front Immunol. 2023 Feb 10;14:1094326. doi: 10.3389/fimmu.2023.1094326. PMID: 36845157; PMCID: PMC9950277. [Journal IF: 8.786]
8. Adegoke A, Kumar D, Budachetri K, **Karim S.** (2022). Hematophagy and tick-borne rickettsial pathogen shape the microbial community structure and predicted functions within the tick vector, *Amblyomma maculatum*. Frontiers in Cellular and Infection Microbiology (Accepted) [Journal IF: 6.073]

9. Ribeiro JMC, Bayona-Vásquez NJ, Budachetri K, Kumar D, Frederick JC, Tahir F, Faircloth BC, Glenn TC, **Karim S**. A draft of the genome of the Gulf Coast tick, Amblyomma maculatum. Ticks Tick Borne Dis. 2023 Mar;14(2):102090. doi: 10.1016/j.ttbdis.2022.102090. Epub 2022 Nov 23. PMID: 36446165; PMCID: PMC9898150. [Journal IF: 3.817]

10. Guizzo MG, Budachetri K, Adegoke A, Ribeiro JMC, **Karim S**. *Rickettsia parkeri* infection modulates the sialome and ovariome of the Gulf coast tick, *Amblyomma maculatum*. Front Microbiol. 2022 Nov 10;13:1023980. doi: 10.3389/fmicb.2022.1023980. PMID: 36439862; PMCID: PMC9684213. [Journal IF: 6.064]

11. Jin L, Jiang BG, Yin Y, Guo J, Jiang JF, Qi X, Crispell G, **Karim S**, Cao WC, Lai R. Interference with LTβR signaling by tick saliva facilitates transmission of Lyme disease spirochetes. Proc Natl Acad Sci U S A. 2022 Nov 22;119(47):e2208274119. doi: 10.1073/pnas.2208274119. Epub 2022 Nov 16. PMID: 36383602; PMCID: PMC9704693. [Journal IF: 12.78]

12. Kumar D, Downs LP, Embers M, Flynt AS, Karim S. Identification of microRNAs in the Lyme Disease Vector *Ixodes scapularis*. Int J Mol Sci. 2022 May 16;23(10):5565. doi: 10.3390/ijms23105565. PMID: 35628370; PMCID: PMC9141961. [Journal IF: 6.2]

13. Kumar D, Sharma SR, Adegoke A, Kennedy A, Tuten HC, Li AY, **Karim S.** Recently Evolved *Francisella*-Like Endosymbiont Outcompetes an Ancient and Evolutionarily Associated *Coxiella*-Like Endosymbiont in the Lone Star Tick (*Amblyomma americanum*) Linked to the Alpha-Gal Syndrome. Front Cell Infect Microbiol. 2022 Apr 12;12:787209. doi: 10.3389/fcimb.2022.787209. PMID: 35493735; PMCID: PMC9039623. [Journal IF: 6.073]

14. Kumar D, Alburaki M, Tahir F, Goblirsch M, Adamczyk J, **Karim S.** An Insight Into the microRNA Profile of the Ectoparasitic Mite *Varroa destructor* (Acari: Varroidae), the Primary Vector of Honey Bee Deformed Wing Virus. Front Cell Infect Microbiol. 2022 Mar 16;12:847000. doi: 10.3389/fcimb.2022.847000. PMID: 35372101; PMCID: PMC8966896. [Journal IF: 6.073]

15. Kumar D, Downs LP, Adegoke A, Machtinger E, Oggenfuss K, Ostfeld RS, Embers M, **Karim S.** An Exploratory Study on the Microbiome of Northern and Southern Populations of *Ixodes scapularis* Ticks Predicts Changes and Unique Bacterial Interactions. Pathogens. 2022 Jan 21;11(2):130. doi: 10.3390/pathogens11020130. PMID: 35215074; PMCID: PMC8880235. [Journal IF: 4.531]

16. Stockmal KA, Downs LP, Davis AN, Kemp LK, **Karim S,** Morgan SE. Cationic Glycopolyelectrolytes for RNA Interference in Tick Cells. Biomacromolecules. 2022 Jan 10;23(1):34-46. doi: 10.1021/acs.biomac.1c00824. Epub 2021 Nov 18. PMID: 34793129; PMCID: PMC9006486. [Journal IF: 6.988]

17. Sharma SR, Crispell G, Mohamed A, Cox C, Lange J, Choudhary S, Commins SP, **Karim S**. Alpha-Gal Syndrome: Involvement of *Amblyomma americanum* α-D-Galactosidase and β-1,4 Galactosyltransferase Enzymes in α-Gal Metabolism. Front Cell Infect Microbiol. 2021;11:775371. doi: 10.3389/fcimb.2021.775371. eCollection 2021. PubMed PMID: 34926322; PubMed Central PMCID: PMC8671611. [Journal IF: 6.073]

18. Choudhary SK, **Karim S,** Iweala OI, Choudhary S, Crispell G, Sharma SR, Addison CT, Kulis M, Herrin BH, Little SE, Commins SP. Tick salivary gland extract induces alpha-gal syndrome in alpha-gal deficient mice. Immun Inflamm Dis. 2021 Sep;9(3):984-990. doi: 10.1002/iid3.457. Epub 2021 May 25. PubMed PMID: 34034363; PubMed Central PMCID: PMC8342229. [Journal IF: 2.5]

19. Sharma SR, **Karim S.** Tick Saliva and the Alpha-Gal Syndrome: Finding a Needle in a Haystack. Front Cell Infect Microbiol. 2021;11:680264. doi: 10.3389/fcimb.2021.680264. eCollection 2021. Review. PubMed PMID: 34354960; PubMed Central PMCID: PMC8331069. [Journal IF: 6.073]

20. **Karim S,** Kumar D, Budachetri K. Recent advances in understanding tick and rickettsiae interactions. Parasite Immunol. 2021 May;43(5):e12830. doi: 10.1111/pim.12830. Epub 2021 Apr 15. Review. PubMed PMID: 33713348; PubMed Central PMCID: PMC8058325. [Journal IF: 2.28]

21. **Karim S,** Kumar D, Adamson S, Ennen JR, Qualls CP, Ribeiro JMC. The sialotranscriptome of the gopher-tortoise tick, Amblyomma tuberculatum. Ticks Tick Borne Dis. 2021 Jan;12(1):101560. doi: 10.1016/j.ttbdis.2020.101560. Epub 2020 Sep 25. PubMed PMID: 33007669; PubMed Central PMCID: PMC7736221. [Journal IF: 3.817]

22. Adegoke A, Kumar D, Bobo C, Rashid MI, Durrani AZ, Sajid MS, **Karim S.** Tick-Borne Pathogens Shape the Native Microbiome Within Tick Vectors. Microorganisms. 2020 Aug 25;8(9). doi: 10.3390/microorganisms8091299. PubMed PMID: 32854447; PubMed Central PMCID: PMC7563471. [Journal IF: 4.926]

23. Bristol AN, Carpenter BP, Davis AN, Kemp LK, Rangachari V, Karim S, Morgan SE. Aqueous RAFT Synthesis of Low Molecular Weight Anionic Polymers for Determination of Structure/Binding Interactions with Gliadin. Macromol Biosci. 2020 Aug;20(8):e2000125. doi: 10.1002/mabi.202000125. Epub 2020 Jun 22. PubMed PMID: 32567240; PubMed Central PMCID: PMC7520052. [Journal IF: 4.979]

24. Zhou W, Tahir F, Wang JC, Woodson M, Sherman MB, **Karim S,** Neelakanta G, Sultana H. Discovery of Exosomes From Tick Saliva and Salivary Glands Reveals Therapeutic Roles for CXCL12 and IL-8 in Wound Healing at the Tick-Human Skin Interface. Front Cell Dev Biol. 2020;8:554. doi: 10.3389/fcell.2020.00554. eCollection 2020. PubMed PMID: 32766239; PubMed Central PMCID: PMC7378379. [Journal IF: 6.684]

25. Adegoke A, Neff E, Geary A, Husser MC, Wilson K, Norris SM, Dharmarajan G, **Karim S.** Laboratory colonization by Dirofilaria immitis alters the microbiome of female Aedes aegypti mosquitoes. Parasit Vectors. 2020 Jul 13;13(1):349. doi: 10.1186/s13071-020-04218-8. PubMed PMID: 32660640; PubMed Central PMCID: PMC7359625. [Journal IF: 3.876].

26. Alburaki M, **Karim S,** Lamour K, Adamczyk J, Stewart SD. RNA-seq reveals disruption of gene regulation when honey bees are caged and deprived of hive conditions. J Exp Biol. 2019 Sep 18;222(Pt 18). doi: 10.1242/jeb.207761. PubMed PMID: 31413101; PubMed Central PMCID: PMC7376871. [Journal IF: 3.312]

27. Alburaki M, Smith KD, Adamczyk J, **Karim S.** Interplay between Selenium, selenoprotein genes, and oxidative stress in honey bee Apis mellifera L. J Insect Physiol. 2019 Aug - Sep;117:103891. doi: 10.1016/j.jinsphys.2019.103891. Epub 2019 Jun 7. PubMed PMID: 31176625; PubMed Central PMCID: PMC7298915. [Journal IF: 2.862]

28. Bullard R, Sharma SR, Das PK, Morgan SE, **Karim S.** Repurposing of Glycine-Rich Proteins in Abiotic and Biotic Stresses in the Lone-Star Tick (*Amblyomma americanum*). Front Physiol. 2019;10:744. doi: 10.3389/fphys.2019.00744. eCollection 2019. PubMed PMID: 31275163; PubMed Central PMCID: PMC6591454. [Journal IF: 4.566]

29. Kumar D, Embers M, Mather TN, **Karim S.** Is selenoprotein K required for Borrelia burgdorferi infection within the tick vector Ixodes scapularis?. Parasit Vectors. 2019 Jun 7;12(1):289. doi: 10.1186/s13071-019-3548-y. PubMed PMID: 31174589; PubMed Central PMCID: PMC6555942. [Journal IF: 3.876].

30. Crispell G, Commins SP, Archer-Hartman SA, Choudhary S, Dharmarajan G, Azadi P, Karim S. Discovery of Alpha-Gal-Containing Antigens in North American Tick Species Believed to Induce Red Meat Allergy. Front Immunol. 2019;10:1056. doi: 10.3389/fimmu.2019.01056. eCollection 2019. PubMed PMID: 31156631; PubMed Central PMCID: PMC6533943. [Journal IF: 8.786].

31. Saito TB, Bechelli J, Smalley C, Karim S, Walker DH. Vector Tick Transmission Model of Spotted Fever Rickettsiosis. Am J Pathol. 2019 Jan;189(1):115-123. doi:

10.1016/j.ajpath.2018.09.005. Epub 2018 Oct 11. PubMed PMID: 30315767; PubMed Central PMCID: PMC6593257. [Journal IF: 4.307].

32. Gregorc A, Alburaki M, Rinderer N, Sampson B, Knight PR, **Karim S,** Adamczyk J. Effects of coumaphos and imidacloprid on honey bee (Hymenoptera: Apidae) lifespan and antioxidant gene regulations in laboratory experiments. Sci Rep. 2018 Oct 9;8(1):15003. doi: 10.1038/s41598-018-33348-4. PubMed PMID: 30301926; PubMed Central PMCID: PMC6177410. [Journal IF: 4.379]
33. Budachetri K, Kumar D, Crispell G, Beck C, Dasch G, **Karim S.** The tick endosymbiont Candidatus Midichloria mitochondrii and selenoproteins are essential for the growth of Rickettsia parkeri in the Gulf Coast tick vector. Microbiome. 2018 Aug 13;6(1):141. doi: 10.1186/s40168-018-0524-2. PubMed PMID: 30103809; PubMed Central PMCID: PMC6090677. [Journal IF: 16.837]
34. Budachetri K, Crispell G, **Karim S.** Amblyomma maculatum SECIS binding protein 2 and putative selenoprotein P are indispensable for pathogen replication and tick fecundity. Insect Biochem Mol Biol. 2017 Sep;88:37-47. doi: 10.1016/j.ibmb.2017.07.006. Epub 2017 Jul 21. PubMed PMID: 28739494; PubMed Central PMCID: PMC5583717. [Journal IF: 4.714]
35. Sands AF, Apanaskevich DA, Matthee S, Horak IG, Harrison A, **Karim S,** Mohammad MK, Mumcuoglu KY, Rajakaruna RS, Santos-Silva MM, Matthee CA. Effects of tectonics and large scale climatic changes on the evolutionary history of Hyalomma ticks. Mol Phylogenet Evol. 2017 Sep;114:153-165. doi: 10.1016/j.ympev.2017.06.002. Epub 2017 Jun 15. PubMed PMID: 28625763. [Journal IF: 4.286]
36. Budachetri K, Kumar D, Karim S. Catalase is a determinant of the colonization and transovarial transmission of Rickettsia parkeri in the Gulf Coast tick Amblyomma maculatum. Insect Mol Biol. 2017 Aug;26(4):414-419. doi: 10.1111/imb.12304. Epub 2017 Apr 1. PubMed PMID: 28370634; PubMed Central PMCID: PMC5496812. [Journal IF: 3.585]
37. **Karim S,** Budachetri K, Mukherjee N, Williams J, Kausar A, Hassan MJ, Adamson S, Dowd SE, Apanskevich D, Arijo A, Sindhu ZU, Kakar MA, Khan RMD, Ullah S, Sajid MS, Ali A, Iqbal Z. A study of ticks and tick-borne livestock pathogens in Pakistan. PLoS Negl Trop Dis. 2017 Jun;11(6):e0005681. doi: 10.1371/journal.pntd.0005681. eCollection 2017 Jun. PubMed PMID: 28650978; PubMed Central PMCID: PMC5501686. [Journal IF: 4.411]
38. Budachetri K, Williams J, Mukherjee N, Sellers M, Moore F, Karim S. The microbiome of neotropical ticks parasitizing on passerine migratory birds. Ticks Tick Borne Dis. 2017 Jan;8(1):170-173. doi: 10.1016/j.ttbdis.2016.10.014. Epub 2016 Oct 28. PubMed PMID: 27802919; PubMed Central PMCID: PMC5472101. [Journal IF: 3.817]
39. Budachetri K, Gaillard D, Williams J, Mukherjee N, **Karim S.** A snapshot of the microbiome of Amblyomma tuberculatum ticks infesting the gopher tortoise, an endangered species. Ticks Tick Borne Dis. 2016 Oct;7(6):1225-1229. doi: 10.1016/j.ttbdis.2016.07.010. Epub 2016 Jul 20. PubMed PMID: 27460902; PubMed Central PMCID: PMC5048529. [Journal IF: 3.817]
40. Bullard R, Allen P, Chao CC, Douglas J, Das P, Morgan SE, Ching WM, **Karim S.** Structural characterization of tick cement cones collected from in vivo and artificial membrane blood-fed Lone Star ticks (Amblyomma americanum). Ticks Tick Borne Dis. 2016 Jul;7(5):880-892. doi: 10.1016/j.ttbdis.2016.04.006. Epub 2016 Apr 16. PubMed PMID: 27118479; PubMed Central PMCID: PMC5460760. [Journal IF: 3.817]
41. Kumar D, Budachetri K, Meyers VC, **Karim S.** Assessment of tick antioxidant responses to exogenous oxidative stressors and insight into the role of catalase in the reproductive fitness of the Gulf Coast tick, Amblyomma maculatum. Insect Mol Biol. 2016 Jun;25(3):283-94. doi: 10.1111/imb.12218. Epub 2016 Feb 26. PubMed PMID: 26919203; PubMed Central PMCID: PMC4860135. [Journal IF: 3.585]

42. Crispell G, Budachetri K, **Karim S.** Rickettsia parkeri colonization in Amblyomma maculatum: the role of superoxide dismutases. Parasit Vectors. 2016 May 20;9(1):291. doi: 10.1186/s13071-016-1579-1. PubMed PMID: 27206371; PubMed Central PMCID: PMC4873992. [Journal IF: 3.876].

43. Chmelař J, Kotál J, **Karim S**, Kopacek P, Francischetti IMB, Pedra JHF, Kotsyfakis M. Sialomes and Mialomes: A Systems-Biology View of Tick Tissues and Tick-Host Interactions. Trends Parasitol. 2016 Mar;32(3):242-254. doi: 10.1016/j.pt.2015.10.002. Epub 2015 Oct 28. Review. PubMed PMID: 26520005; PubMed Central PMCID: PMC4767689. [Journal IF: 9.014]

44. Bullard RL, Williams J, **Karim S.** Temporal Gene Expression Analysis and RNA Silencing of Single and Multiple Members of Gene Family in the Lone Star Tick Amblyomma americanum. PLoS One. 2016;11(2):e0147966. doi: 10.1371/journal.pone.0147966. eCollection 2016. PubMed PMID: 26872360; PubMed Central PMCID: PMC4752215. [Journal IF: 3.752]

45. Budachetri K, **Karim S.** An insight into the functional role of thioredoxin reductase, a selenoprotein, in maintaining normal native microbiota in the Gulf Coast tick (Amblyomma maculatum). Insect Mol Biol. 2015 Oct;24(5):570-81. doi: 10.1111/imb.12184. Epub 2015 Jul 17. PubMed PMID: 26184979; PubMed Central PMCID: PMC4560682. [Journal IF: 3.585]

46. Ali A, Khan S, Ali I, Karim S, da Silva Vaz I, Termignoni C. Probing the functional role of tick metalloproteases. Physiological Entomology. 2015 September; 40(3):177-188. doi: 10.1111/phen.12104. [Journal IF: 2.22]

47. **Karim S,** Ribeiro JM. An Insight into the Sialome of the Lone Star Tick, Amblyomma americanum, with a Glimpse on Its Time Dependent Gene Expression. PLoS One. 2015;10(7):e0131292. doi: 10.1371/journal.pone.0131292. eCollection 2015. PubMed PMID: 26131772; PubMed Central PMCID: PMC4489193. [Journal IF: 3.752]

48. Al-Deeb MA, Muzaffar SB, Abu-Zeid YA, Enan MR, **Karim S.** First record of a spotted fever group Rickettsia sp. and Theileria annulata in *Hyalomma dromedarii* (Acari: Ixodidae) ticks in the United Arab Emirates. The Florida entomologist. 2015; 98(1):135-139. [Journal IF: 1.03]

49. Adamson S, Browning R, Singh P, Nobles S, Villarreal A, **Karim S.** Transcriptional activation of antioxidants may compensate for selenoprotein deficiencies in Amblyomma maculatum (Acari: Ixodidae) injected with selK- or selM-dsRNA. Insect Mol Biol. 2014 Aug;23(4):497-510. doi: 10.1111/imb.12098. Epub 2014 Apr 4. PubMed PMID: 24698418; PubMed Central PMCID: PMC4107163. [Journal IF: 3.585]

50. Mukherjee N, Beati L, Sellers M, Burton L, Adamson S, Robbins RG, Moore F, **Karim S.** Importation of exotic ticks and tick-borne spotted fever group rickettsiae into the United States by migrating songbirds. Ticks Tick Borne Dis. 2014 Mar;5(2):127-34. doi: 10.1016/j.ttbdis.2013.09.009. Epub 2013 Nov 16. PubMed PMID: 24252263; PubMed Central PMCID: PMC3946858. [Journal IF: 3.817]

51. Huang KF, Hsu HL, **Karim S,** Wang AH. Structural and functional analyses of a glutaminyl cyclase from Ixodes scapularis reveal metal-independent catalysis and inhibitor binding. Acta Crystallogr D Biol Crystallogr. 2014 Mar;70(Pt 3):789-801. doi: 10.1107/S1399004713033488. Epub 2014 Feb 22. PubMed PMID: 24598748; PubMed Central PMCID: PMC8494195. [Journal IF: 7.652]

52. Budachetri K, Browning RE, Adamson SW, Dowd SE, Chao CC, Ching WM, **Karim S.** An insight into the microbiome of the Amblyomma maculatum (Acari: Ixodidae). J Med Entomol. 2014 Jan;51(1):119-29. doi: 10.1603/me12223. PubMed PMID: 24605461; PubMed Central PMCID: PMC3956751. [Journal IF: 2.278]

53. Adamson SW, Browning RE, Budachetri K, Ribeiro JM, **Karim S.** Knockdown of selenocysteine-specific elongation factor in Amblyomma maculatum alters the pathogen burden of Rickettsia parkeri with epigenetic control by the Sin3 histone deacetylase corepressor complex. PLoS

One. 2013;8(11):e82012. doi: 10.1371/journal.pone.0082012. eCollection 2013. PubMed PMID: 24282621; PubMed Central PMCID: PMC3840058. [Journal IF: 3.752]

54. Adamson SW, Browning RE, Chao CC, Bateman RC Jr, Ching WM, **Karim S.** Molecular characterization of tick salivary gland glutaminyl cyclase. Insect Biochem Mol Biol. 2013 Sep;43(9):781-93. doi: 10.1016/j.ibmb.2013.05.011. Epub 2013 Jun 13. PubMed PMID: 23770496; PubMed Central PMCID: PMC3740044. [Journal IF: 4.714]

55. Browning R, **Karim S.** RNA interference-mediated depletion of N-ethylmaleimide sensitive fusion protein and synaptosomal associated protein of 25 kDa results in the inhibition of blood feeding of the Gulf Coast tick, Amblyomma maculatum. Insect Mol Biol. 2013 Jun;22(3):245-57. doi: 10.1111/imb.12017. Epub 2013 Feb 25. PubMed PMID: 23437815; PubMed Central PMCID: PMC3644323. [Journal IF: 3.585]

56. Browning R, Adamson S, **Karim S.** Choice of a stable set of reference genes for qRT-PCR analysis in Amblyomma maculatum (Acari: Ixodidae). J Med Entomol. 2012 Nov;49(6):1339-46. doi: 10.1603/me12123. PubMed PMID: 23270161. [Journal IF: 2.278]

57. Karim S, Browning R, Ali L, Truhett R. Laboratory-infected Ehrlichia chaffeensis female adult Amblyomma americanum salivary glands reveal differential gene expression. J Med Entomol. 2012 May;49(3):547-54. doi: 10.1603/me11214. PubMed PMID: 22679861. [Journal IF: 2.278]

58. **Karim S,** Adamson SW. RNA interference in ticks: a functional genomics tool for the study of physiology (Invited chapter). In: Jockusch EL, editor. Small RNAs: Their Diversity, Roles, and Practical Uses. Storrs: Elsevier; 2012.

59. **Karim S,** Singh P, Ribeiro JM. A deep insight into the sialotranscriptome of the gulf coast tick, Amblyomma maculatum. PLoS One. 2011;6(12):e28525. doi: 10.1371/journal.pone.0028525. Epub 2011 Dec 21. PubMed PMID: 22216098; PubMed Central PMCID: PMC3244413. [Journal IF: 3.752]

60. **Karim S,** Troiano E, Mather TN. Functional genomics tool: gene silencing in Ixodes scapularis eggs and nymphs by electroporated dsRNA. BMC Biotechnol. 2010 Jan 14;10:1. doi: 10.1186/1472-6750-10-1. PubMed PMID: 20074328; PubMed Central PMCID: PMC2823657. [Journal IF: 3.25]

61. **Karim S**, Kenny B, Troiano E, Mather TN. RNAi-mediated gene silencing in tick synganglia: a proof of concept study. BMC Biotechnol. 2008 Mar 26;8:30. doi: 10.1186/1472-6750-8-30. PubMed PMID: 18366768; PubMed Central PMCID: PMC2386130. [Journal IF: 3.25]

62. Kotsyfakis M, **Karim S**, Andersen JF, Mather TN, Ribeiro JM. Selective cysteine protease inhibition contributes to blood-feeding success of the tick Ixodes scapularis. J Biol Chem. 2007 Oct 5;282(40):29256-63. doi: 10.1074/jbc.M703143200. Epub 2007 Aug 13. PubMed PMID: 17698852. [Journal IF: 5.486]

63. **Karim S,** Miller NJ, Valenzuela J, Sauer JR, Mather TN. RNAi-mediated gene silencing to assess the role of synaptobrevin and cystatin in tick blood feeding. Biochem Biophys Res Commun. 2005 Sep 9;334(4):1336-42. doi: 10.1016/j.bbrc.2005.07.036. PubMed PMID: 16040003. [Journal IF: 3.575]

64. **Karim S**, Ramakrishnan VG, Tucker JS, Essenberg RC, Sauer JR. Amblyomma americanum salivary gland homolog of nSec1 is essential for saliva protein secretion. Biochem Biophys Res Commun. 2004 Nov 26;324(4):1256-63. doi: 10.1016/j.bbrc.2004.09.189. PubMed PMID: 15504350. [Journal IF: 3.575]

65. **Karim S,** Ramakrishnan VG, Tucker JS, Essenberg RC, Sauer JR. Amblyomma americanum salivary glands: double-stranded RNA-mediated gene silencing of synaptobrevin homologue and

inhibition of PGE2 stimulated protein secretion. Insect Biochem Mol Biol. 2004 Apr;34(4):407-13. doi: 10.1016/j.ibmb.2004.01.005. PubMed PMID: 15041024. [Journal IF: 4.714]

66. Karim S, Essenberg RC, Dillwith JW, Tucker JS, Bowman AS, Sauer JR. Identification of SNARE and cell trafficking regulatory proteins in the salivary glands of the lone star tick, Amblyomma americanum (L.). Insect Biochem Mol Biol. 2002 Dec;32(12):1711-21. doi: 10.1016/s0965-1748(02)00111-x. PubMed PMID: 12429123. [Journal IF: 4.714]
67. Karim S, Dean DH. Pesticidal and receptor binding properties of Bacillus thuringiensis Cry1Ab and Cry1Ac delta-endotoxin mutants to Pectinophora gossypiella and Helicoverpa zea. Curr Microbiol. 2000 Dec;41(6):430-40. doi: 10.1007/s002840010163. PubMed PMID: 11080394. [Journal IF: 2.29]
68. Karim S, Gould F, Dean DH. Bacillus thuringiensis delta-endotoxin proteins show a correlation in toxicity and short circuit current inhibition against Helicoverpa zea. Curr Microbiol. 2000 Sep;41(3):214-9. doi: 10.1007/s002840010122. PubMed PMID: 10915211. [Journal IF: 2.29]
69. Karim S, Riazuddin S, Gould F, Dean DH. Determination of receptor binding properties of Bacillus thuringiensis delta endotoxins to cotton bollworm (Helicoverpa zea) and Pink Bollworm (Pectinophora gossypiella). Pesticide Biochemistry Physiology. 2000; 67:198-216. [Journal IF: 3.963]

Patents:

- Kotsyfakis M, Ribeiro JMC, Valenzuela JG, Andersen JF, Anderson JM, **Karim S,** Mather TN. (2008). Methods for detection and prevention of tick infestation and pathogen transmission. PCR/2008/009075

Grantsmanship:

Pending ($3 million)

- NIH NIAID. RO1. *Tick hemocyte-mediated immune responses to Ehrlichia infection*. 03/01/2025-02/28/2030. $2.3 million (PI)
- NIH NIAID. R21. Vector Tick determinants of Ricekttsiae transovarial transmission. $407,000.00 (PI)
- NIH NIAID. R21 (sub). Mechanisms of the immune response to tick salivary antigens in alpha-gal syndrome. $97,143. (Sub-award PI).
- USAID. US-Egypt S&T Cooperaton. Understanding the impact of climatic changes on hone bee innate immunity. 03/01/2025-02/28/2027. $200,000.00 (PI)

Active Awards and Grants ($8.9 million)

- USDA NIFA. Reference atlas of *Apis mellifera* hemocyte transcriptomes. 09/15/2024-09/14/2026, $300,000.00 (PI)
- NIH NIAID. R21 (PI). The role of hemocytes in tick *Rickettsia parkeri* infection. Dec 2023-Octoer 2025. $407,000.00
- USDA AFRI. Seed grant (PI). Targeting microRNA targets in Varroa biology. May 2023-April 2025. $300,000.00
- NIH NIAID, R15 (CO-PI: Morgan: PI). Pluripotency of novel tick cysteine protease inhibitors during hematophagy. 07/21/2022-06/31/2025. $444,000.00

- NIH NIAID. RO1 (sub-awardee: Karim; PI: Rong Fang). Rational development of vaccine against tick-borne rickettsiosis. 08/01/2022-007/31/2026. $3,272,060.00
- NIH NIAID, RO1 (sub-awardee: Karim: PI: Scott Commins). Understanding Alpha-Gal Red Meat Allergy. 09/01/2018-01/31/2029, $2.3 million
- USDA ARS (Karim, PI). Functional genomics of *Varroa destructor-Apis mellifera* interactions. 09/02/2015-12/31/2024. $324,000.00
- USDA ARS (Karim, PI). A microRNA approach to understanding honey bee pathogen host interactions. 04/03/2023- 04/02/2027, $102,500.00
- NSF MRI: Track 2 Acquisition of a transmission electron microscope with cryogenic imaging capabilities for research and education. $1,100,136.00 (Co-PI)
- NSF. MRI: Acquisition of an Orbitrap Exploris 240 High-Resolution LC-MS for Research, Education, and Outreach at the University of Southern Mississippi (USM). $640,000.00(Co-PI)

Completed Awards and Grants

- Jim A. Payne Foundation Award. (Donaldson J: PI). Advancement of women in natural sciences (Advancement WiNS). 09/01/2021-08/31/2023. $170,000.00 (Co-PI)
- National Institutes of health. MS-INBRE Bioinformatics core (Co-Investigator: Karim; PI: Mo Elasri). 2018-2023, $19 million.
- USDA AFRI. Seed grant (PI). From Sialome shifts to Sialome switches and sialome phases. A new paradigm in vector-borne animal diseases. September 2017-August 2019. $150,000.00
- USDA ARS. Cooperative agreement (PI). Evaluation of pesticide-induced oxidative stress in honey bee (*Apis mellifera*). September 2015-August 2020. (yr1: $70,000, yr2: $169,819.00)-$239,819.00
- USAID: US-Pakistan Science and Technology Cooperation Program. Capacity building for Vector-Borne neglected diseases of livestock (Joint project with Univ. of Animal and Veterinary Sciences, Lahore, Pakistan). (PI: Shahid Karim). 2017-2020, $500,000.00
- National Institutes of Health, R15 (Co-Investigator, PI: Sarah Morgan), Investigating molecular assembly and dynamics of tick cement proteins. September 2017-August 2021. $442,500.00
- National Institutes of health. Bioinformatics core (Co-PI: Karim; PI: Mo Elasri). 2014-2018, $14 million.
- USDA AFRI. Seed grant (PI). Role of Tick Spit in Meat Allergy. Funding period December 2015-December 2017. $100,000.00
- NIH NIAID. R15 (PI). Role of vector antioxidant factors in *Amblyomma-Rickettsia* interaction. 2012-2016. $439,500.00
- National Science Foundation (MS EPSCoR). Seed grant (PI). Investigating the molecular architecture of tick cement cone. 2014-2016. $71,908.00
- National Science Foundation (MS EPSCoR), International Exchange (PI). Mining the tick sialome for potential targets to prevent tick-borne diseases. 2013-2014. $6000.00
- National Science Foundation (MS EPSCoR). Seed grant (PI). Elucidating the molecular gene networks which facilitate Japanese beetle food digestion and insecticide resistance. 2013-2014. $48,495.00

- USAID (Pakistan-US Science and Technology Cooperation Program). (PI). Arthropod functional genomics initiative: building community resources for animal health. 2010-2013. $500,000.00
- National Science Foundation (MS EPSCoR), International Exchange (PI). Developing a functional genomics and computational biology approach to target disease vector. 2010-2011. $5000.00
- The higher Education Commission of Pakistan. Postdoctoral mentor. Advance training of a visiting postdoctoral fellow in arthropod molecular biology. Jan 2010-Dec 2010. $9,975.00
- American Heart Association (Scientist Development grant program). (PI). Targeting Lyme disease vector. 2009-2013. $307,996.00
- United State Department of Agriculture. Regular award (PI). RNA interference to study the role of exocytosis in tick-borne pathogen transmission. 2007-2011. $357,000.00
- National Academy of Sciences (Pakistan-US Science and Technology Cooperation Program). (Co-PI; PI: Thomas Mather). Building molecular biology capacity for preventing tick-transmitted diseases in Pakistan. 2007-2011. $490,000.
- University of Rhode Island (URI) Council of Research & URI Foundation Research proposal development grant program. (PI). Digestome: Developing transcriptional profiles of the Japanese beetle (*Popillia japonica*). 2008. $10000.00
- Rhode Island Foundation. Seed grant (PI). Developing microRNA profiles with probable regulatory roles in ticks. 2007-2008. $10,000.00
- University of Rhode Island (URI) Council for Research, Research proposal development grant. (PI). RNAi-mediated gene silencing for discovering vaccine and therapeutic targets in ticks. 2006-2007. $7,722.00
- National Institute of Health-Rhode Island-INBRE. Seed grant (PI). Dissecting regulation of intracellular vesicle trafficking in a tick salivary gland model. 2006-2007. $25,000.00

INVITED NATIONAL AND INTERNATIONAL SEMINARS (Selected)

- **Karim, S.** (Invited Speaker), “PBT Recognition Award in Insect Physiology, Biochemistry and Toxicology winner presentation: Understanding the role of sugar coated tick bite in alpha-gal syndrome”. 2023 Annual meeting of Entomological Society of America, November 5-8, National Harbor, MD.
- **Karim, S.** (Invited Speaker), "An intricate story of ticks, their microbes, and emerging Alpha-Gal Syndrome," University of Texas San Antonio, UTSA, San Antonio, TX. (February 25, 2022).
- **Karim S.** (2016). Elucidating vector biology to fight diseases. Mississippi State University’s College of Veterinary Sciences, November 8th (Invited talk)
- **Karim S.** (2014). Bridging the innovation gap for tick and tick-borne diseases in Pakistan: capacity building for the development of a new generation of anti-vector vaccines. Advances in tick and tick-borne diseases prevention, Faisalabad, Pakistan, August 05-07 (Inaugural session talk)
- **Karim S.** (2014). Mining the tick sialome for potential targets to prevent tick and tick-borne diseases. Advances in tick and tick-borne diseases prevention, Faisalabad, Pakistan, August 05-07 (Keynote technical talk)
- **Karim S.** (2014). Genes to Vaccine: targeting Lyme disease vector for novel control strategies. Advances in tick and tick-borne diseases prevention, Faisalabad, Pakistan, August 05-07.
- **Karim S**. (2014). Functional genomics of Tick Sialome to prevent Tick-Borne Diseases. October 17, Northwest Florida State College, Niceville, Florida (Invited talk)

- **Karim S.** University of Southern Mississippi, Department of Biological Sciences, "Functional genomics of tick sialome to prevent tick-borne diseases"-BSC Research Seminar series (November 18, 2011).
- **Karim S.** University of Agriculture (Faisalabad), Pakistan, Department of Veterinary Parasitology, "Functional genomics of tick sialome to prevent tick-borne diseases", via Video Conferencing (September 29, 2011)
- **Karim S.** University of Tennessee (Knoxville), Department of Entomology and Plant Pathology, iTick approach: Functional genomics of tick Sialome. (Summer 2011)
- **Karim S.** University of Gujrat's Nawaz Sharif Medical College, Pakistan, "Targeting arthropod disease vector in post-genomic era" (Summer 2010)
- **Karim S.** Sindh Agriculture University, Tandojam, Pakistan, "Manipulation of tick salivary gland genes by intracellular pathogens" (Summer 2010)
- **Karim S.** University of Karachi's National Center of Proteomics, Pakistan, "Targeting arthropod disease vectors in post-genomic era" (Summer 2010)
- **Karim S.** Naval Medical Research Center, Infectious Diseases Division, Silver Spring, Maryland, "Proteo-Exome analysis of tick salivary glands" (Summer 2010)
- **Karim S.** The University of Southern Mississippi, Biomedical and Bioinformatics Research Symposium, "Proteo-Exome analysis of tick salivary glands" (2010)
- **Karim S.** Naval Medical Research Center, Rickettsial Diseases laboratory, Silver Spring, Maryland, Targeting arthropod disease vectors in poest-genomic era"(Spring 2010)
- **Karim S.** Sindh Agriculture University, Pakistan, "Targeting arthropod disease vector in post-genomic era" via video conferencing (2009)
- **Karim S.** ERDC Vicksburg, Mississippi, "Targeting arthropod disease vectors in post-genomic era" (2009)
- **Karim S.** Sindh Agriculture University, Pakistan, 'Insect genomics: targeting the physiology of invasive insect pests" via video conferencing (2009)
- **Karim S.** The University of Southern Mississippi, Administrative justice class, "Forensic entomology" (2009)
- **Karim S.** The University of Southern Mississippi, Tri Beta lunch time lecture, "Targeting Lyme disease vector for novel control strategies" (2008)
- **Karim S.** The University of Southern Mississippi, MFGN group, "Manipulation of tick membrane transport pathway by intracellular pathogen" (2008)
- **Karim S.** The University of Southern Mississippi, Department of Biological Sciences, "Targeting Lyme disease vector: coding versus non-coding RNAs" (2008)
- **Karim S.** University of Rhode Island, University-wide research seminar, "Targeting the Lyme disease vector in post-genomic era" (2008)
- **Karim S.** University of Texas Health Center, Tyler, Tick salivary genes to anti-tick vaccines: Reverse antigen and RNAi approaches for identifying candidate molecules (2007)

NATIONAL AND INTERNATIONAL MEETING PRESENTATIONS (selected)

- **Karim S.** Are redox signaling and innate immunity the keystone of vector competence in ticks? 2018 ESA, ESC and ESBC Joint Annual meeting, November 11-14, Vancouver, BC, Canada.
- **Karim S.** Elucidating the molecular mechanism of transovarial transmission of tick-borne rickettsiae. The 2016 XXV International Congress of Entomology, September 25-20, Orlando, FL.
- **Karim S.** Functional genomics of tick selenoproteins: an examination of how the dynamics of reactive oxygen species affect tick feeding and pathogen movement, 2015 Southeastern Branch Meeting of Entomological Society of America, March 15-18, 2015, Biloxi, MS.
- **Karim S.** Mining the tick sialome for potential targets to prevent tick attachment Invited talk at Entomological Society of America's 61st annual meeting, November 10-13, 2013, Austin, Texas.

- **Karim S.** Avian migration-tick-borne infections without borders. Invited talk at the 87th annual meeting of the Southeastern Branch (Ent. Soc. America), March 3-5, 2013, Baton Rouge, Louisiana.
- **Karim S.** Functional genomics of the gulf coast tick sialome. Invited talk at the Joint Meeting of the Southeastern and southwestern branches of Entomological Society of America, March 4-7, 2012, Little Rock, Arkansas.
- **Karim S.** Functional genomics of tick sialome to prevent tick-borne diseases. Invited talk at the Tick and Tick-borne Pathogens (TTP7) International Conference, August 28-September 2, 2011, Zaragoza, Spain.
- **Karim S**. iTick approach Functional genomics of tick sialome. Invited talk at the Southeast Branch-ESA Annual meeting- Acarology and Post-Genomics Era symposium. March 19-22, 2011, San Juan, Puerto Rico.
- **Karim S.** Control of an invasive insect pest *Popillia japonica* by RNAi. Invited talk at the Southeast Branch-ESA Annual meeting- Turf & Ornamental Entomology symposium, March 19-22, 2011, San Juan, Puerto Rico.
- **Karim S.** The 58th annual meeting of Entomological Society of America, invited oral presentation in RNA-interference insect management: Real-world applications, late breaking symposium, December 12-15, 2010, San Diego, CA, USA
- **Karim S.** The 57th annual meeting of Entomological Society of America, Invited oral presentation in advances in Acarology symposium, December 13-16, 2009, Indianapolis, IN, USA
- **Karim S.** The 56th annual meeting of Entomological society of America, invited oral presentation in "tick genomics and beyond-new advances in tick-borne disease system symposium, November 16-19, 2008, Reno, NV, USA

Student Research Advising:

Postdoctoral associates and visiting scientists Research mentored

- Dr. Deepak Kumar, postdoctoral fellow, April 2018-present
- Dr. Mohamed Alburaki, postdoctoral fellow, November 2017-June 2019 (USDA ARS)
- Dr. Chen Ze, Visiting postdoctoral fellow, March 2016-Nov 2016 (China)
- Dr. Steve Adamson, postdoctoral fellow, 2011-2014 (Attorney)
- Jawad UL Hassan, Visiting student, Univ. of Agriculture, Faisalabad, Pakistan, September 2013-January 2014. (Veterinarian)
- Asma Kausar, Visiting student, Univ. of Agriculture, Faisalabad, Pakistan, March-July 2013
- Dr. Zafar Iqbal, Visiting senior scientist, Univ. of Agriculture, Faisalabad, Pakistan. April-June, 2012
- Dr. Muhammad Sohail Sajid, visiting postdoctoral fellow, Jan 2010-Dec 2010
- Dr. Raj Kumar June 2009-September 2009

Graduate Students mentored:

- Parul Singh, MS, 2009-2011
    - MS awarded Summer 2011
    - Thesis Title: Discovery and molecular characterization of Selenoprotein M in the salivary glands of *Amblyomma maculatum*, the Gulf Coast tick
- Nabanita Mukherjee, MS, 2011-2013
    - MS awarded Summer 2013
    - Thesis Title: Molecular detection of tick-borne pathogens associated with ixodid tick species infesting migratory songbirds and ruminants

- Khemraj Budachetri, MS, 2011-2013
    - MS awarded Summer 2013
    - Thesis Title: An insight into the microbial diversity and expression of cysteine protease inhibitors (Cystatin) in *Rickettsia parkeri* infected *Amblyomma maculatum*
- Rebecca Browning, MS, 2012-2013
    - MS awarded Summer 2013
    - Thesis Title: Elucidating the functional role of AmSNAP-25 and AmNSF in the salivary glands of *Amblyomma maculatum*, the gulf coast tick
- Jaclyn Williams, MS, 2013-2015
    - MS awarded Summer 2015
    - Thesis Title: Elucidating the molecular function of reprolysin metalloproteases in tick-host interaction
- Rebekah Bullard, PhD, 2013-2016
    - PhD awarded Spring 2016
    - Thesis Title: Characterization of Glycine-Rich proteins from the salivary glands of the lone-star tick *Amblyomma americanum*
- Deepak Kumar, PhD, 2012-2016
    - PhD awarded Fall 2016
    - Investigating the functional role of tick antioxidants in hematophagy and vector competence
- Khemraj Budachetri, PhD, 2013-2017
    - PhD awarded Spring 2017
    - Thesis Title: Study of *Rickettsia parkeri* colonization and proliferation in *Amblyomma maculatum* (Acari: Ixodidae)
- Nicholas Rinderer, MS 2016-2018
    - MS awarded Fall 2018
    - Thesis title: Antioxidant genes in *Apis mellifera*, their implication in pesticide detoxification
- Latoyia P. Downs, MS 2017-2020
    - MS Awarded Spring 2020
    - Characterizing ERAD and antioxidant response in *Ixodes scapularis* ISE6 cells during Borrelia infection
- Raima Sen, MS 2019- 2021
    - MS Awarded Summer 2021
    - Characterization of the bacterial microbiome of exotic tick species collected from migratory birds
- Gary Crispell, MS, 2015-2022
    - PhD awarded Fall 2022

    - Thesis title: Investigating the involvement of the tick vector in the induction of alpha-galactose hypersensitivity (Alpha-Gal, red meat allergy) in the United States.
- Surendraraj Sharma, PhD-2018- 2023
    - PhD awarded in Spring 2023
    - Characterization of tick and host associated factors linked to induction of Alpha-Gal Syndrome
- Faizan Tahir, MS- 2016-2024
    - MS pending in Spring 2024
    - Molecular Characterization of Stress Response in Western Honey Bee (*Apis mellifera*)
- Abdulsalam Adegoke, PhD-2019- 2024
    - PhD pending in Spring 2024
    - Understanding the tick cellular immunity to pathogen infection
- Latoyia Downs, PhD- 2020-Present
- Michael Oeth, MS-2021-Present

Undergraduate students mentored
(Asterisks (*) note honors thesis)
2024- *Anza Ali- University of Southern Mississippi
Astrid Gomez-McNair Scholar, University of Southern Mississippi
2023- *Julia Hanson-University of Southern Mississippi
*Sabrina Walia- University of Southern Mississippi
*Anza Ali-University of Southern Mississippi
2022-*Julia Hanson-University of Southern Mississippi
*Sabrina Walia- University of Southern Mississippi
2012-*Erin Owen-University of Southern Mississippi
*Sumar Beauti-University of Southern Mississippi
2020- Ahmed Mohamed- University of Southern Mississippi
*Cailyn Bobo- University of Southern Mississippi
*Madison Woodward- University of Southern Mississippi
2019- * Ahmed Mohamed- University of Southern Mississippi
*Cailyn Bobo- University of Southern Mississippi
*Madison Woodward- University of Southern Mississippi
Even Smith (MS-INBRE fellow)- Mississippi State University
Thomas Pegoda (MS-INBRE fellow)-Mississippi State University
2018- *Ahmed Mohammed (MS-INBRE fellow)- University of Southern Mississippi
Kristina Smith (MS-INBRE fellow)-University of Southern Mississippi
2017- *Cameron Cox (MS-INBRE fellow)- Univ. of Southern Mississippi
*Joshua Lange (MS-INBRE fellow)-Univ. of Southern Mississippi
Nancy Wu (MS-INBRE fellow)-Univ. of Southern Mississippi
*Kenneth Boucher-Univ. of Southern Mississippi
Kristina Smith- Univ. of Southern Mississippi
2016- *Annabelle Clark (MS-INBRE summer fellow)- Univ. of Southern Mississippi
*Karthik Balamurugan (MS-INBRE summer fellow)-Univ. of Southern Mississippi
*Afnan Beauti- Univ. of Southern Mississippi
Paige Allen- University of Southern Mississippi
Cameron Cox- University of Southern Mississippi
2015- *Joseph Jelinski (MS-INBRE summer fellow)- University of Southern Mississippi

Paige Allen (MS-INBRE summer fellow)- University of Southern Mississippi
Christine Beck (MS-INBRE summer fellow)-Delta State University
Amanda Ray (MS-INBRE summer fellow)- William Carey University
Karthik Balamurugan (summer research intern)- University of Southern Mississippi
2014- Gary Crispell (MS-INBRE summer fellow)- University of Southern Mississippi
Virginia C. Meyers (MS-INBRE summer fellow)- University of Southern Mississippi
Amanda J. Waddle- University of Southern Mississippi
Devon A. Narcisse- University of Southern Mississippi
Kelsey Carter- University of Southern Mississippi
2013- Michael J. Reid, University of Southern Mississippi
Kelsey Carter- University of Southern Mississippi
2012- Michael J. Reid- University of Southern Mississippi
Kylee Dueitt- University of Southern Mississippi
Iesha Hubbard, AGEM Summer Research Intern- Jackson State University
**Stoney Flexter, Sumrall High School Student
2011- Sarah Nobles- William Carey University, UMMC Class of 2012
*Ashley Villarreal (MS-INBRE summer fellow), USM – UMMC Class of 2013
Darius K Dear, University of Southern Mississippi
Regrick A. Young- University of Southern Mississippi
Timothy C. Russell- University of Southern Mississippi
Monica D. Shoemake- University of Southern Mississippi
2010- Kylee Dueitt- University of Southern Mississippi
Sidney McClendon- University of Southern Mississippi
Lacey Sipsey- University of Southern Mississippi
William D'Angelo (MS INBRE summer Fellow), University of Southern Mississippi
Robin Dixon- University of Southern Mississippi
Markques Given- University of Southern Mississippi (BSC492, USM),
2009- Brian Bosworth- University of Southern Mississippi
Brennen Thomas- University of Southern Mississippi
*Kenneth Busby- (MS-INBRE summer fellow)- USM, SOM class of 2013
William D'Angelo- University of Southern Mississippi
Chelsa Williams (MS-INBRE Fellow), University of Southern Mississippi
Valerie Dowell (MS-INBRE fellow), Pearl River Community College
2008- Harold Goldman- University of Southern Mississippi
Marquita Kitchens- University of Southern Mississippi

Grants/Fellowships awarded to Lab Undergraduate students
[Student earned awards]

- Evan Smith, 2019 MS-INBRE Summer REO
- Thomas Pegoda, 2019 MS-INBRE Summer REO
- Ahmed Mohamed, 2019, VPR travel grant [Poster on Hill conference 2015 (Washington DC)]
- Ahmed Mohammed, 2018 MS-INBRE summer REO
- Kristina Smith, 2018 MS-INBRE summer REO
- Nancy Wu, 2017 MS-INBRE summer REO
- Cameron Cox, 2017 MS-INBRE summer REO
- Joshua Lange, 2017 MS-INBRE summer REO
- Paige Allen, Eagle SPUR, $1000.00 (2017)
- Annabelle Clark, Eagle SPUR, $1000.00 (2016)
- Joseph Jelinski, VPR Travel grant [Poster on Hill conference 2016 (Washington DC)]
- Annabelle Clark, 2016 MS-INBRE summer REO

- Karthik Balamurugan, 2016 MS-INBRE summer REO
- Joseph Jelinski, Eagle SPUR, $1000.00 (2015)
- Joseph Jelinski, 2015 MS-INBRE summer REO
- Paige Allen, 2015 MS-INBRE summer REO
- Christine Beck, 2015 MS-INBRE summer REO, Delta State Univ.
- Amanda Ray, 2015 MS-INBRE summer REO, William Carey Univ.
- Paige Allen, Eagle SPUR, $1000.00 (2015)
- Virginia Caroline Meyers, VPR Travel grant [Poster on Hill conference 2015 (Washington DC)]
- Gary Crispell, 2014 MS-INBRE summer REO,
- Virginia C. Meyers, 2014 MS-INBRE summer REO
- Ashley Villarreal, 2011MS-INBRE summer REO
- William D'Angelo, 2010 MS INBRE summer REO
- Chelsa Williams, 2009 MS-INBRE summer REO
- Valerie Dowell, 2009 MS-INBRE summer REO Pearl River Community College
- Kenneth Busby, 2009 MS-INBRE summer REO

Current Research Group (Fall 2022)

- Dr. Deepak Kumar, assistant research professor
- Faizaan Tahir, PhD Student
- Latoyia Downs, PhD Student
- Abdulsalam Adegoke, PhD Student
- Michael Oeth, MS Student
- Sabir Hussain, visiting scholar
- Anza Ali, HONORS Undergraduate researcher
- Astrid Gomez, McNair Scholar

TEACHING ACTIVITY

Courses offered at The University of Southern Mississippi

- BSC410/410L/510/510L, Human Parasitology (4 hrs)
  - Fall 2023 (20); Fall 2021 (15); Fall 2019 (17);
  - 48 student total, Spring 2010, Fall 2013, Fall 2015, Fall 2021 (15)
- BSC412/412L/512/512L, Medical Entomology (4 hrs)
  - Spring 2023 (24); Spring 2021 (22); Spring 2019 (21); Spring 2017 (8); Spring 2016 (19);
  - 53 students total, Spring 2009, Spring 2012, Spring 2014, Spring 2016,
- BSC453/553, Invertebrate Physiology (3 hrs)
  - Spring 2024 (21); Spring 2020 (10); 25 students total, Fall 2010, Fall 2012
- BSC476, Molecular Biology lecture (3 hrs)
  - 71 students enrolled; Fall 2020
- BSC478L/578L, Molecular Biology Laboratory (4 credit hrs)
  - 51 students total, Spring 2011, Spring 2013, Spring 2014
- BSC491/491L/591/591L, Introduction to Bioinformatics (4 credit hrs)
  - 45 student total, Fall 2009, Fall 2011, Spring 2015, Fall 2016, Fall 2016
- BSC492/492H, Research problem-directed individual research study (undergraduate research credit)
  - 31 students total, Fall 2008-present

- BSC497, Senior practicum (1 credit hrs)
    - Fall 2023 (21); Spring 2022 (41), Spring 2021 (27); Spring 2020 (27); Spring 2018 (34); Fall 2016 (12); 117 students total, Spring 2012, Spring & Fall 2013, Fall 2014, Spring 2015, Fall 2016
- BSC690, Biomedical graduate students Seminar (1 hr)
    - 7 graduate students enrolled, Fall 2022
- BSC691, Research (Individual directed Research) (1-9 hrs)
    - 48 students enrolled, 2008-present
- BSC698, Thesis (Thesis research)
    - 11 students enrolled, Fall 2008-present
- BSC790. Biological Science seminar (1 hr.)
    - 231 students total, Fall 2012-Spring 2016
- BSC791, Research in Biology (Dissertation Research)
    - 31 students enrolled, 2008-present
- BSC776, Topics in Gene Regulation (lecture) (4 credit hrs)
    - 7 graduate students total, Fall 2022
- BSC898, Dissertation (Dissertation Research)
    - 6 graduate students enrolled; Spring 2016-present

SERVICE ACTIVITY

Professional Organization's Service Activities

- Organized Mississippi INBRE Single Cell RNA Sequencing Symposium at Mississippi Academy of Sciences annual meeting, Feb 23, 2023.
- Organized Mississippi INBRE Omics Symposium at Mississippi Academy of Sciences annual meeting, March 31st, Biloxi, MS (2022)
- Ticks and Parasite Mites: From Ecology to the Molecular Bases of Host-parasite-microbe Interactions On-Demand Presentations at the annual meeting of Entomological society of America, October 31, November 3, 2021, Denver, CO, USA. (Virtual Symposium)
- Organized Mississippi INBRE Microbiome Symposium at the annual meeting of Mississippi Academy of Sciences, August 5th, Biloxi, MS (2021)
- Organized Tick and Tick-Borne Disease Symposium at the SouthCentral Branch ASM annual meeting, September 18, Hattiesburg, MS (2015)
- Organized "Novel Molecular Approaches to Prevent Ticks and Tick-Borne Diseases Symposium" at the annual Southeastern branch ESA meeting, March 15-18, 2015, Biloxi, MS.
- Session Chair, Bioinformatics Section, 2015 IDeA Conference, Biloxi, MS (2015).
- Organized Mississippi INBRE Bioinformatics-Big Data (BD2K) to Knowledge-Pitfall, Progress, and Future, at the 79th Mississippi Academy of Sciences annual meeting, Feb 27-28, Hattiesburg, MS (2015).
- Member, local organizing committee, Southeastern branch of Entomological Sciences of America annual meeting, Biloxi, MS. (2015)
- Moderator, Ten minutes papers PBT/MUVE section Graduate student paper competition, ESA annual meeting, Portland, OR. (2014)
- Moderator, Ten minutes papers PBT/MUVE section Graduate Student competition, ESA annual meeting, Austin, Texas (2013).
- Functional Genomics of Tick-Pathogen interface symposium organized with Dr. Albert Mulenga (Texas A & M Univ.) at the joint meeting of the Southeastern and Southwestern branches of Entomological Society of America, March 4-7, Little Rock, Arkansas (2012)

- Judge, Student poster competition, the annual meeting of Entomological Society of America (2011)
- Organized Infectious Disease Symposium at 75th annual meeting (2011)
- Committee member, Nan-Yao Su award for innovation and creativity in Entomology, Entomological Society of America (2009-2012)
- Judge, Student paper competition for the President's prize, the 58th annual meeting: Physiology, Biochemistry and Toxicology (PBT) section, Dec 12-15, San Diego, CA, USA (2010)
- Late breaking symposium, "RNA-interference in insect management: Real-World applications" organized with Dr. Kent Shelby (USDA ARS-BCIRL), and Wayne Hunter (USDA ARS) at the 58th annual meeting of ESA, Dec 12-15, San Diego, CA, USA (2010)
- "Tick and Tick-borne diseases" symposium organized at the annual meeting of American Society of Microbiology South Central Branch in Hattiesburg, Mississippi (October 29th, 2010)
- Judge, Student poster competition for the president's prize, the annual meeting of Entomological Society of America, December 13-16, Indianapolis, IN, USA (2009)
- Moderator, SVPHS: Applied Ecology, The annual meeting of Entomological Society of America, December 13-16, Indianapolis, IN, USA (2009)
- Judge, Student paper competition for the president's Prize, Entomological Society of America's 58th annual meeting: Physiology, Biochemistry and Toxicology (PBT) section, (2007)

Granting Agencies

- Study section member. (August 20, 2020 - May 31, 2021).
- 1) American Heart Association (Spring 2021)
  2) NIH R13 Study section (December 2020)
- Proposals Reviewed. (August 20, 2020 - May 31, 2020).
- 1) Welcome Trust, UK
  2) The Higher Education Commission of Pakistan
  3) Elsevier book proposal review
  4) University of Toledo
- National Institutes of Health
  - Genome Center study section November 2018
  - R13 study section June 2016
  - R13 Study section November 2016
  - Malaria Study section, October 2016
  - VB study section July 2015
  - VMD study section June 2015
  - VB study Section
- National Science Foundation's Integrative Organismal Systems (IOS) program
- United States of Agriculture 2016
- American Heart Association Study Section 2015' 2016; 2017, 2018, 2020, 2021
- Czech Republic National Science Foundation 2016; 2018
- University of United Arab Emirates research 2017
- American Heart Association study section 2018
- FY2018 CDMRP Tick-Borne Disease Research Program study section

Scientific Journals

Insect Biochemistry and Molecular Biology, Gene, Parasitology, Vaccine, Archives of Insect Physiology, Journal of Insect Physiology, Veterinary Parasitology, International Journal of Parasitology, Pakistan Journal of Zoology, Journal of Medical Entomology, Pesticide

Biochemistry and Physiology, Journal of Proteomics, Experimental Parasitology, Tick and Tick-borne diseases, Insect Molecular Biology, Emerging microbes & Infections, PLoS Neglected Tropical Diseases, PLoS ONE, Molecular Ecology, Nucleic Acid Research, Acarology, Pest Management Science, Toxin, Pathogen, Parasites & Vectors, Journal of Thermal Biology

The University of Southern Mississippi Service Activities:

- Member, Faculty Senate. (September 2019 - 2022).
- Member, Assessment Committee. (August 2017 - Present).
- Member, Institutional Biosafety Committee. (August 2014 - Present).
- Member, University Awards Committee. (August 20, 2020 - May 31, 2021).
- Chair, College Scholarships and Awards Committee 2018
- Member, College awards Committee, 2017-present
- Member, the Univ. of Southern Miss Institutional Biosafety Committee: 2011- Present
- Member, The University of Southern Miss Assessment Committee; 2016-present

Department of Biological Sciences Service Activities:

- Member, Biological Science Graduate admission committee: 2014-present
- Biological Sciences seminar coordinator:
  - Fall 2012-Spring 2016
- Faculty Advisor: 2009-Present
  - Undergraduate student advisement and writing recommendation letters for students
- Chair, Biological Sciences pretenure committee
  - Dr. Fengwei Bai 2014
  - Dr. Alex Flynt 2016
- Faculty Search Committees:
  - Member, Biological Sciences Chair search committee, 2015-2016
  - Member, Disease Biology search committee, 2015-2016
  - Member, Marine Biology faculty search committee, 2014-2015
  - Member, Biological Sciences search committee, 2012-2013
  - Member, Biomedical Sciences faculty committee 2011-2012.
- Judge, Biological Sciences Graduate Student Symposium, The University of Southern Mississippi (2009)
- Faculty advisor, Biological Sciences GSF, the University of Southern Mississippi (2009)

Graduate study committees (23)

- *Chair: Khemraj Budachetri, Jaclyn Williams, Nicholas R. Rinderer, Nabanita Mukherjee, Deepak Kumar, Gary P. Crispell, Rebekah Bullard, Rebecca Browning, Parul Singh*
- *Member:* Tolulope Ayo, Farzana Nazneen, Iyanuoluwani Owolobi, Damilola Oyebode, Shahzeed UL-Karim, John Vines, Chandan Gurug, Sweta Kanal, Mona Fendereski, Jacob Peters, *Dhiraj Acharya, Pratikshya Adhikari, Ahmed Y Salem Alzuway, Logan T. Blancett, William D'Angelo, Matthew A. De Cruz, Amelsaad BA El Barasi, David Jayroe, Zundra D. Lucas, Md Mosharraf Hossain Mondal, Gyan S Sahukhal, Dhritiman Samanta, J M Sellers Jr., Chengwen Teng*

Community outreach

- Science Café talk on Blood sucking ticks (2014)
- Science Café panel member, “Should we engineer the mosquito?” (2016)