

CURRICULUM VITAE

MUKESH KUMAR, DVM, MS, PHD

Georgia State University
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Academic Training

- 2010-13 Doctor of Philosophy (PhD) in Medical Virology, Department of Tropical Medicine, Medical Microbiology and Pharmacology (DTMMMP), John A. Burns School of Medicine (JABSOM), University of Hawaii at Manoa (UHM), Honolulu, Hawai'i
- 2008-09 Master of Science (MS) in Medical Virology, DTMMMP, JABSOM, UHM, Honolulu, Hawai'i
- 2001-07 Bachelor of Veterinary Science and Animal Husbandry (DVM), College of Veterinary Science and Animal Husbandry, Jawaharlal Nehru Krishi Vishwa Vidyalaya (JNKVV), Jabalpur, India

Professional Experience

- 2018- Assistant Professor, Department of Biology, College of Arts and Sciences, Georgia State University
- 2018- Adjunct Assistant Professor, DTMMMP, JABSOM, UHM
- 2015-18 Assistant Professor, DTMMMP, JABSOM, UHM
- 2013-18 Associate Director, JABSOM Biocontainment Facility, Pacific Center for Emerging Infectious Disease Research (PCEIDR), UHM
- 2013-15 Instructor, DTMMMP, JABSOM, UHM
- 2008-13 Graduate Research Assistant, DTMMMP, JABSOM, UHM

RESEARCH/SCHOLARSHIP

***Scientific Peer-Reviewed Journal Publications* (*Corresponding author, #Student author)**

1. Sharma P, Kumar S, Srivastava S, Srivastava M, Jee B, Gorobets N, Kumar D, **Kumar M**, Asthana S, Zhang P, Zoltner M and Rathi B. Computational Study of Novel inhibitory molecule, 1-(4-((2S,3S)-3-amino-2-hydroxy-4-phenylbutyl)piperazin-1-yl)-3-phenylurea, with high potential to competitively block ATP binding to the RNA dependent RNA polymerase of SARS-CoV-2 virus. *Journal of Biomolecular Structure & Dynamics*. 2021. In Press (**JIF: 4.5**).
2. **Kumar M*** and Iyer. S. ASSURED-SQVM Diagnostics for COVID-19: Addressing the Why, When, Where, Who, What and How of Testing. *Expert Review of Molecular Diagnostics*. 2021 Apr;21(4):349-362. (**JIF: 4.1**).
3. **Kumari P#**, Rothan HA, **Natekar JP#**, **Stone S#**, **Pathak H#**, **Strate PG#**, Arora K, Brinton MA, and **Kumar M***. Neuroinvasion and encephalitis following intranasal inoculation of SARS-CoV-2 in K18-hACE2 mice. *Viruses*. 2021 Jan 19;13(1):132. (**JIF: 3.9**).
4. Rak-Kyun Seong, Jae Kyung Lee, Geum Joon Cho, **Kumar M***, and Shin OS*. mRNA and miRNA profiling of Zika virus-infected human umbilical cord mesenchymal stem cells

- identifies miR-142-5p as an antiviral factor. *Emerging Microbes & Infections*. 2020 Dec;9(1):2061-2075. **(JIF: 6.0)**.
5. Rothan HA, Acharya A, Reid SP, **Kumar M***, Byrareddy SN*. Molecular Aspects of COVID-19 Differential Pathogenesis. *Pathogens*. 2020, 9(7), 538. **(JIF: 3.4)**.
 6. Rothan HA, [Stone S#](#), [Natekar JP#](#), [Kumari P#](#), Arora K, and **Kumar M***. The FDA-approved gold drug Auranofin inhibits novel coronavirus (SARS- COV-2) replication and attenuates inflammation in human cells. *Virology*. 2020 August 547;7-11. **(JIF: 3.2)**.
 7. Mittal K, Choi D, Wei G, Kaur J, Klimov, Arora K, Griffith C, **Kumar M**, Precious I, Jacob P, Melton B, Bhimji-Pattni S, Osan R, Rida P, Golusinski P, and Aneja R. Hypoxia-induced centrosome amplification underlies aggressive disease course in HPV-negative oropharyngeal squamous cell carcinomas. *Cancers*. 2020 Feb 24;12(2):517. **(JIF: 6.1)**.
 8. [Natekar JP#](#), Rothan HA, Arora K, [Strate PG#](#), and **Kumar M***. Cellular microRNA-155 regulates virus-induced inflammatory response and protects against lethal West Nile virus infection. *Viruses* 2020, 12(1),9. **(JIF: 3.9)**.
 9. Rothan HA, **Kumar M***. Role of endoplasmic reticulum-associated proteins in flavivirus replication and assembly complexes. *Pathogens* 2019, 8(3),148. **(JIF: 3.4)**.
 10. Rothan HA, Arora K, [Natekar JP#](#), [Strate PG#](#), Brinton MA, **Kumar M***. Z-DNA-binding protein 1 is critical for controlling virus replication and survival in West Nile virus encephalitis. *Frontiers in Microbiology*. 2019;10:2089. **(JIF: 4.5)**.
 11. Nerurkar PV, Orias D, Soares N, **Kumar M**, Nerurkar VR. Momordica charantia (bitter melon) modulates adipose tissue inflammasome gene expression and adipose-gut inflammatory cross talk in high-fat diet (HFD)-fed mice. *Journal of Nutritional Biochemistry*. 2019 Jun;68:16-32. **(JIF: 4.5)**.
 12. [Azouz F#](#), Arora K, [Krause K#](#), Nerurkar VR, **Kumar M***. Integrated MicroRNA and mRNA Profiling in Zika Virus-Infected Neurons. *Viruses*. 2019 Feb 16;11(2),162. **(JIF: 3.9)**.
 13. [Krause K#](#), [Azouz F#](#), Nakano E, Nerurkar VR, and **Kumar M***. Deletion of pregnancy zone protein and murinoglobulin-1 restricts the pathogenesis of West Nile virus infection in mice. *Frontiers in Microbiology*. 2019;10:259. **(JIF: 4.5)**.
 14. Kim JA, Seong RK, **Kumar M*** and Shin OS*. Favipiravir and Ribavirin inhibit replication of Asian and African strains of Zika virus in different cell models. *Viruses*. 2018 Feb 9;10(2),72. **(JIF: 3.9)**.
 15. To A, Medina L, Mfuh K, Lieberman MM, Wong T, Namekar M, Nakano E, Lai C, **Kumar M**, Nerurkar VR, and Lehrer AT. Recombinant Zika virus subunits are immunogenic and efficacious in mice. *mSphere*. 2018 Jan 10;3(1):e00576-17.
 16. [Krause K#](#), [Azouz F#](#), Shin OS, and **Kumar M***. Understanding the Pathogenesis of Zika Virus Infection Using Animal Models. *Immune Network* 2017 Oct;17(5):287-297. **Invited Review**.
 17. Seong RK, Seo SW, Kim JA, Fletcher SJ, Morgan NV, **Kumar M**, Choi YK, and Shin OK. Schlafen 14 is a novel antiviral factor involved in the control of viral replication. *Immunobiology*. 2017; 222(11):979-988. **(JIF: 2.8)**.
 18. **Kumar M***, [Krause K#](#), [Azouz F#](#), Nakano E, and Nerurkar VR. A guinea pig model of Zika virus infection. *Virology Journal*. 2017 14(1):75. **(JIF: 2.8)**.
 19. **Kumar M**, [Ching L#](#), Astern J, Stokes AJ, Lim E, Melish ME, and Nerurkar VR. Prevalence of Antibodies to Zika virus in Mothers from Hawaii who Delivered Babies with and without

- Microcephaly between 2009-2012. *PLoS Neglected Tropical Diseases*. 2016;10(12): e0005262. **(JIF: 4.5)**.
20. Cuijijiat M, Darling SE, Nerurkar VR, Ching N, **Kumar M**, Min SK, Wong R, Grant L, and Melish ME. Clinical and imaging findings in an infant with Zika embryopathy. *Clinical Infectious Diseases*. 2016; 63(6):805-11. **(JIF: 8.80)**.
 21. **Kumar M**, Belciad M, and Nerurkar VR. Identification of genes critical for resistance to infection by West Nile virus in mice brain using RNA-Seq analysis. *Nature Scientific Reports*. 2016; 6:26350. **(JIF: 5.57)**.
 22. **Kumar M** and Nerurkar VR. In vitro and in vivo blood-brain barrier models to study West Nile virus pathogenesis. *Methods in molecular biology*. 2016;1435:103-13.
 23. Gu SH, **Kumar M**, Sikorska B, Hejduk J, Markowski J, Markowski M, Liberski PP and Yanagihara R. Isolation and partial characterization of a highly divergent lineage of Hantavirus from the European Mole (*Talpa europaea*). *Nature Scientific Reports*. 2016 Feb 19;6:21119. **(JIF: 5.57)**.
 24. **Kumar M**, Roe K, O'Connell, M, and Nerurkar VR. Induction of virus-specific effector immune cell response limits virus replication and severe disease in mice infected with non-lethal West Nile virus Eg101 strain. *Journal of Neuroinflammation*. 2015 Sep 22;12(1):178. **(JIF: 6.0)**.
 25. Kim JA, Park SK, **Kumar M**, Lee CH, and Shin O. Insights into the role of immunosenescence during Varicella Zoster (Shingles) virus infection in aging cell model. *Oncotarget*. 2015 Nov 3;6(34):35324-43. **(JIF: 6.62)**.
 26. Park SJ, **Kumar M**, Kwon H, Seong RK, Han K, Song JM, Kim CJ, Choi YK, and Shin O. Dynamic changes in host gene expression associated with H5N8 avian influenza virus infection in mice. *Nature Scientific Reports*. 2015 Nov 18;5:16512. **(JIF: 5.57)**.
 27. **Kumar M**, O'Connell, M, Namekar, M and Nerurkar VR. Infection with non-lethal West Nile virus Eg101 strain induces immunity that protects mice against the lethal West Nile virus NY99 strain. *Viruses*. 2014 Jun 6;6(6):2328-39. **(JIF: 3.9)**.
 28. Shin O, Song G, **Kumar M**, Yanagihara R, Lee HW, and Song JW. Hantaviruses modulate anti-viral and pro-inflammatory innate immune responses in astrocytic cells and the brain. *Viral Immunology*. 2014 Aug;27(6):256-66. **(JIF: 1.63)**.
 29. **Kumar M**, Roe K, Nerurkar PV, Orillo B, Thompson KS, Verma S, and Nerurkar VR. Reduced immune cell infiltration and increased neuroinflammation in type 2 diabetic mice infected with West Nile virus. *Journal of Neuroinflammation*. 2014 Apr 21;11:80. **(JIF: 6.0)**.
 30. **Kumar M** and Nerurkar VR. Integrated analysis of microRNAs and their disease related targets in the brain of mice infected with West Nile virus. *Virology*. 2014;452-453:143-51. **(JIF: 3.6)**.
 31. Shin O, **Kumar M**, Yanagihara R, and Song JW. Hantaviruses induce cell type- and viral species-specific host microRNA expression signatures. *Virology*. 2013 Nov;446(1-2):217-24. **(JIF: 3.6)**.
 32. **Kumar M**, Roe K, Orillo B, Nerurkar VR, and Verma S. Inflammasome sensor apoptosis-associated speck-like protein containing CARD (ASC) restricts West Nile virus infection and spread to the central nervous system. *Journal of Virology*. 2013 Apr; 87(7):3655-67. **(JIF: 4.64)**.

33. Namekar M, **Kumar M**, O'Connell M, and Nerurkar VR. Effect of serum heat-inactivation and dilution on detection of anti-WNV antibodies in mice by West Nile virus E-protein microsphere immunoassay. *PLoS ONE*. 2012; 7(9):e45851. (**JIF: 3.53**).
34. **Kumar M**, Roe K, Nerurkar PV, Namekar M, Orillo B, Verma S, and Nerurkar VR. Impaired virus clearance, compromised immune response and increased mortality in type 2 diabetic mice infected with West Nile virus. *PLoS ONE*. 2012; 7(8):e44682. (**JIF: 3.53**).
35. Roe K*, **Kumar M***, Nerurkar VR, and Verma S. In vivo West Nile virus-induced disruption of the blood-brain barrier is characterized by the disruption of tight junction proteins and increase in matrix metalloproteinases. *Journal of General Virology*. 2012 Jun; 93(Pt 6):1193-203. (**JIF: 3.52**). ***Equal contribution**
36. Verma S, Hoffmann FW, **Kumar M**, Huang Z, Roe K, Nguyen-Wu E, Hashimoto AS, and Hoffmann PR. Selenoprotein K knockout mice exhibit deficient calcium flux in immune cells and impaired immune responses. *Journal of Immunology*. 2011 Feb 15;186(4):2127-37. (**JIF: 5.36**).
37. Verma S*, **Kumar M***, and Nerurkar VR. Cyclooxygenase-2 inhibitor blocks the production of WNV-induced neuroinflammatory markers in astrocytes. *Journal of General Virology*. 2011 Mar;92(Pt 3):507-15. (**JIF: 3.52**). ***Equal contribution**
38. **Kumar M**, Verma S, and Nerurkar VR. Pro-inflammatory cytokines derived from West Nile virus (WNV)-infected SK-N-SH cells mediates neuroinflammatory markers and neuronal death. *Journal of Neuroinflammation*. 2010 Oct 31;7:73. (**JIF: 6.0**)
39. Verma S, **Kumar M**, Gurjav U, Lum S, and Nerurkar VR. Reversal of West Nile virus-induced blood-brain barrier disruption and tight junction proteins degradation by matrix metalloproteinases inhibitor. *Virology*. 2010 Feb 5;397(1):130-8. (**JIF: 3.6**).
40. Verma S, Lo YY, Chapagain M, Gurjav U, Lum S, **Kumar M**, Lo H, Tanaka A, and Nerurkar VR. West Nile virus infection modulates human brain micro-vascular endothelial cells tight junction proteins and cell adhesion molecules: Transmigration across the in-vitro blood-brain barrier. *Virology*. 2009 Mar 15;385(2):425-33. (**JIF: 3.6**).

Book Chapters

1. **Kumar M**, Yanagihara R and Liberski PP. Rabies virus. In: `Neuroinfections', Liberski PP, Kozubski W and Katz M (eds). Wydawnictwo Lekarskie PZWL, Warsaw, Poland, 2015, pp. 140-143.
2. **Kumar M**. Polio virus. In: `Neuroinfections', Liberski PP, Kozubski W and Katz M (eds). Wydawnictwo Lekarskie PZWL, Warsaw, Poland, 2015, pp. 153-154.
3. **Kumar M**. Enterovirus 71. In: `Neuroinfections', Liberski PP, Kozubski W and Katz M (eds). Wydawnictwo Lekarskie PZWL, Warsaw, Poland, 2015, pp. 157-158.
4. **Kumar M**. Enterovirus 68. In: `Neuroinfections', Liberski PP, Kozubski W and Katz M (eds). Wydawnictwo Lekarskie PZWL, Warsaw, Poland, 2015, pp. 158-159.

Selected Invited Presentations:

1. COVID-19 and Brain. Invited lecture; UNESCO and Moulay Ismail University, Morocco, May 26, 2021.
2. Novel Therapeutic Targets for Emerging RNA Viruses. Invited lecture; Department of Chemistry, University of Puerto Rico- Río Piedras, April 13, 2021.

3. Understanding SARS-CoV-2 Pathophysiology: From Mechanisms to Potential Therapeutic Targets. Invited lecture; Center for Diagnostics & Therapeutics (CDT), Georgia State University, February 17, 2021.
4. Emerging Infections of the Central Nervous System. Invited lecture; College of Veterinary Science, MHOW, India, October 30, 2020.
5. Pathogenesis of SARS-CoV-2 infection. Invited lecture; Department of Tropical Medicine, Medical Microbiology and Pharmacology, John A. Burns School of Medicine, University of Hawaii, Honolulu, September 30, 2020.
6. Keynote Speaker. International Webinar on COVID-19 Pandemic. Amity University, New Delhi, India, June 22-23, 2020.
7. Global Research Perspectives to Pandemic COVID-19. Invited lecture; Department of Biotechnology, Jawahar Lal Nehru University, New Delhi, India, June 13, 2020.
8. New insights into the pathogenesis of encephalitic flaviviruses. Department of Veterinary Pathobiology, Oklahoma State University, Stillwater, May 29, 2018.
9. Neuropathogenesis of West Nile virus infection. Invited lecture; Department of Biomedical and Diagnostic Sciences, The University of Tennessee, Knoxville, April 16, 2018.
10. Zika virus-associated microcephaly in animals. Invited lecture; Department of Biological Sciences, Old Dominion University, Norfolk, Virginia, December 18, 2017.
11. New insights into the pathogenesis of encephalitic flaviviruses. Invited lecture; 2017 NIH IDeA Western Regional Conference. Jackson Hole, Wyoming, October 19, 2017.
12. Zika virus associated neurological diseases. Invited Lecture; Korea University School of Medicine, Seoul, South Korea, July 15, 2017.
13. Neuropathogenesis of West Nile virus infection. Invited lecture; Department of Microbiology Seminar Series, UHM, Honolulu, 2016.
14. Molecular Testing, “Changing the Game” – Review the New Strategies for Early Diagnosis, Management. American Medical Technologists 77th Educational Program and Educational Meeting, Hawaii, June 23, 2015.

National/International Conference & Symposium Presentations (#Student author)

1. Arora K, [Natekar JP[#]](#), Rothan HA, **Kumar M**. MicroRNA regulation of Zika virus Infection. 2019. *Journal of NeuroVirology*. <https://doi.org/10.1007/s13365-019-00807-1>.
2. [Natekar JP[#]](#), [Strate PG[#]](#), Rothan HA, Arora K, and **Kumar M**. Z-DNA-binding protein in West Nile virus encephalitis. 2019. *Journal of NeuroVirology*. <https://doi.org/10.1007/s13365-019-00807-1>.
3. [Stone S[#]](#), [Azouz F[#]](#), Nerurkar VR, and **Kumar M**. Congenital Zika syndrome in guinea pigs. 2019. *Journal of NeuroVirology*. <https://doi.org/10.1007/s13365-019-00807-1>.
4. Rothan HA, Arora K, and **Kumar M**. Multiplexed digital gene expression profiling of West Nile virus neurovirulence in C57BL/6J and C57BL/6N mouse models. 2019. *Journal of NeuroVirology*. <https://doi.org/10.1007/s13365-019-00807-1>.
5. **Kumar M**, [Krause K[#]](#), [Azouz F[#]](#), Nakano E, Nerurkar VR, and Deletion of pregnancy zone protein and murinoglobulin-1 restricts the pathogenesis of West Nile virus infection in mice. *American Society for Virology (ASV) 38th Annual Conference*, Minneapolis, July 20-24, 2019.

6. **Kumar M**, [Stone S[#]](#), [Azouz F[#]](#), Nerurkar VR, and Congenital Zika syndrome in guinea pigs. *ASV 38th Annual Conference*, Minneapolis, July 20-24, 2019.
7. Elisara T, [Ching L[#]](#), **Kumar M**, Astern J, and Nerurkar VR. Serodiagnostic assay for the identification of ZIKV antibodies in cord blood. *American Society of Tropical Medicine and Hygiene (ASTMH) 66th annual meeting*, Maryland, November 5-9, 2017.
8. Nerurkar VR, [Azouz F[#]](#), [Krause K[#]](#), [Ching L[#]](#), **and Kumar M**. Function of Schlafen4 in the pathogenesis of flavivirus encephalitis. *ASTMH 66th annual meeting*, Maryland, November 5-9, 2017.
9. Elisara T, [Ching L[#]](#), **Kumar M**, Astern J, and Nerurkar VR. Identification of Zika virus antibodies in cord blood. *RCMI Translational Science 2017 Conference*, Washington DC, October 28-November 1, 2017.
10. [Azouz F[#]](#), [Krause K[#]](#), [Ching L[#]](#), Nerurkar VR, **and Kumar M**. A Novel Role of Schlafen4 in West Nile Virus Replication and Pathogenesis. *ASTMH 66th annual meeting*, Maryland, November 5-9, 2017.
11. **Kumar M**, Melish M, and Nerurkar VR. Zika virus-associated microcephaly in Hawaii. *International Union of Microbiological Societies 2017 Meeting*, Singapore, July 17-21, 2017.
12. Wong T, To A, Medina L, Lieberman MM, Namekar M, Nakano E, **Kumar M**, Nerurkar VR, and Lehrer AT. Development of a recombinant Zika virus vaccine based on insect cell expressed subunits. *International Union of Microbiological Societies 2017 Meeting*, Singapore, July 17-21, 2017.
13. [Seong RK[#]](#), Seo SW, Kim JA, Park SK, **Kumar M**, and Shin OK. Schlafen 14 is a novel antiviral factor involved in the control of viral replication. *International Union of Microbiological Societies 2017 Meeting*, Singapore, July 17-21, 2017.
14. [Krause K[#]](#), [Azouz F[#]](#), Nakano E, Nerurkar VR, and **Kumar M**. A guinea pig model of Zika virus infection. *American Society for Virology (ASV) 36th Annual Conference*, Wisconsin, June 24-28, 2017.
15. To A, Medina L, Lieberman MM, Wong T, Namekar M, Nakano E, **Kumar M**, Nerurkar VR, and Lehrer AT. Development of a recombinant Zika virus vaccine based on insect cell expressed subunits. *ASV 36th Annual Conference*, Wisconsin, June 24-28, 2017.
16. **Kumar M**, Shin OK, Hughes L and Nerurkar VR, and. Virus-induced Schlafen genes and their role in replication and pathogenesis. *ASV 35th Annual Conference*, Blacksburg, Virginia, June 18-22, 2016.
17. **Kumar M**, [Hughes L[#]](#) and Nerurkar VR, and. Expression and regulatory effects of Schlafen genes in flavivirus infection. *American Association of Immunologists (AAI) 103rd Annual Meeting*, Seattle, Washington, May 13-17, 2016. **(Early Career Faculty Award)**.
18. **Kumar M**, Belciad M, and Nerurkar VR. Identification of host genes leading to West Nile virus encephalitis in mice brain using RNA-Seq analysis. *17th International Congress on Infectious Diseases*, Hyderabad, India, March 2-5, 2016.
19. Gu SH, **Kumar M**, Sikorska B, Hejduk J, Markowskic J, Markowski M, Liberski PP and Yanagihara R. Isolation of a highly divergent hantavirus from the European mole (*Talpa europaea*) in Poland. *American Society of Tropical Medicine and Hygiene 64th annual meeting*, Philadelphia, Pennsylvania, October 25-29, 2015.
20. Gu SH, **Kumar M**, Hejduk J, Markowskic J, Markowski M, Liberski PP and Yanagihara R. Preliminary characterization of a novel hantavirus isolated from the European mole (*Talpa europaea*). *9th International Conference on Emerging Infectious Diseases*, Atlanta, Georgia, August 24-26, 2015.
21. **Kumar M**, and Nerurkar VR. Negative correlation between protective effect of migrating immune cells and associated inflammation in mouse model of WNV infection. *ASV 34th*

- Annual Conference*, Western University, London ON, Canada, July 11-15, 2015. **(ASV Travel Award)**
22. **Kumar M**, and Nerurkar VR. Identification of genes critical for resistance to infection by West Nile virus in mice brain using RNA-Seq analysis. *ASV 34th Annual Conference*, Western University, London ON, Canada, July 11-15, 2015. **(ASV Travel Award)**
 23. **Kumar M**, and Nerurkar VR. Defining cause-and-effect relationships between virus replication, infiltration of immune cells, and production of inflammatory mediators in mouse models of West Nile virus-associated neuroinflammation. *Keynote Symposia on Neuroinflammation in the Diseases of Central Nervous System*, Taos, New Mexico, January 25-30, 2015.
 24. **Kumar M**, O'Connell, M, Namekar, M and Nerurkar VR. Infection with non-lethal West Nile virus Eg101 strain induces immunity that protects mice against the lethal West Nile virus NY99 strain. *ASV 33rd Annual Conference*, Colorado State University, Fort Collins, Colorado, June 21-25, 2014.
 25. **Kumar M**, O'Connell, M, and Nerurkar VR. Differential antiviral, inflammatory and pathological responses in lethal and non-lethal West Nile virus infections in mice. *ASV 33rd Annual Conference*, Colorado State University, Fort Collins, Colorado, June 21-25, 2014.
 26. Lazaga NB, **Kumar M**, and Nerurkar VR. Development of a human polyomavirus JC infection model using humanized NSG mice. *ASV 33rd Annual Conference*, Colorado State University, Fort Collins, Colorado, June 21-25, 2014.
 27. **Kumar M**, Roe K, Nerurkar PV, Orillo B, Thompson KS, Verma S and Nerurkar VR. Type 2 diabetes in mice impairs immune cell infiltration and neuroinflammation after West Nile virus infection. *Third Biennial Western Regional IDeA Scientific Conference*, Honolulu, Hawai'i, October 6-8, 2013.
 28. **Kumar M**, and Nerurkar VR. Integrated analysis of microRNAs induced by West Nile virus infection and their disease related targets in mouse brain. *Third Biennial Western Regional IDeA Scientific Conference*, Honolulu, Hawai'i, October 6-8, 2013.
 29. Lazaga NB, **Kumar M**, and Nerurkar VR. Development of a human polyomavirus JC infection model using humanized NSG mice. *Third Biennial Western Regional IDeA Scientific Conference*, Honolulu, Hawai'i, October 6-8, 2013.
 30. Nerurkar PV, **Kumar M**, and Nerurkar VR. Differential expression of microRNA and neuroinflammatory target mRNA profiles in diabetic mouse brains. *Third Biennial Western Regional IDeA Scientific Conference*, Honolulu, Hawai'i, October 6-8, 2013.
 31. **Kumar M**, Roe K, Nerurkar PV, Orillo B, Thompson KS, Verma S and Nerurkar VR. Reduced immune cell infiltration and increased neuroinflammation in type 2 diabetic mice infected with West Nile virus. *ASV 32nd Annual Conference*, Penn State University, State College, Pennsylvania, July 20-24, 2013. **(ASV Travel Award)**
 32. **Kumar M**, Roe K, Nerurkar PV, Orillo B, Thompson KS, Verma S, and Nerurkar VR. Reduced immune cell infiltration and increased neuroinflammation in type 2 diabetic mice infected with West Nile virus. *AAI 100th Annual Meeting*, Honolulu, Hawai'i, May 3-7, 2013. **(AAI Travel Award)**
 33. Verma S, **Kumar M**, Roe K, Orillo B, Muruve D, Nerurkar VR, and Gale M. Inflammasome adaptor protein ASC is critical for the immune response and survival in West Nile virus encephalitis. *AAI 100th Annual Meeting*, Honolulu, Hawai'i, May 3-7, 2013.
 34. **Kumar M**, Roe K, Nerurkar PV, Namekar M, Orillo B, Verma S and Nerurkar VR. Impaired virus clearance, compromised immune response and increased mortality in type 2 diabetic mice infected with West Nile virus. *ASV 31st Annual Conference*, Madison, Wisconsin, July 16-20, 2012.
 35. Namekar M, **Kumar M**, O'Connell, M, and Nerurkar VR. Effect of serum heat-inactivation and dilution on enhanced detection of anti-WNV IgM and IgG antibodies in mice by WNV E-

- protein microsphere immunoassay. *ASV 31st Annual Conference*, Madison, Wisconsin, July 16-20, 2012.
36. **Kumar M**, Roe K, Orillo B, Nerurkar VR, and Verma S. Protective Role of Inflammasome Adaptor Apoptosis-associated Speck-like Protein Containing a CARD in West Nile Virus Infection. *12th Annual Meeting of the Federation of Clinical Immunology Societies*, Vancouver, Canada, June 20-23, 2012. (**Dai Ho Chun Travel Fellowship**)
 37. **Kumar M**, Roe K, Nerurkar PV, Namekar M, Orillo B, Verma S and Nerurkar VR. Impaired virus clearance, compromised immune response and increased mortality in type 2 diabetic mice infected with West Nile virus. *12th International Immunology of Diabetes Society Conference*, Victoria, Canada, June 15-19, 2012. (**Dai Ho Chun Travel Fellowship**)
 38. **Kumar M**, Verma S, and Nerurkar VR. Cyclooxygenase enzymes and prostaglandin E2 modulate West Nile virus-induced neuroinflammation, and regulate the production of neuroinflammatory molecules including matrix metalloproteinases (MMP). *Society on Neuroimmune Pharmacology 18th Scientific Conference*, Honolulu, Hawai'i, April 25-28, 2012. (**Outstanding Investigator Award**)
 39. **Kumar M**, Verma S, and Nerurkar VR. Cyclooxygenase (COX) enzymes and prostaglandin E2 (PGE2) modulate West Nile virus (WNV)-induced neuroinflammation, and regulate the production of neuroinflammatory molecules including matrix metalloproteinases (MMP). *ASV 30th Annual Conference*, Minneapolis, Minnesota, July 16-20, 2011.
 40. Verma S, **Kumar M**, Roe K, Lum S and Nerurkar VR. Inflammasome sensor apoptosis-associated spec-like protein containing CARD (ASC) restricts West Nile virus (WNV) infection and spread to the central nervous system. *ASV 30th Annual Conference*, Minneapolis, Minnesota, July 16-20, 2011.
 41. Roe K, **Kumar M**, Lum S, Orillo B, Nerurkar VR and Verma S. In vivo West Nile virus-infection modulates the markers of blood-brain barrier disruption. *ASV 30th Annual Conference*, Minneapolis, Minnesota, July 16-20, 2011.
 42. **Kumar M**, Verma S, and Nerurkar VR. Pro-inflammatory cytokines mediate WNV-induced neuroinflammation. *12th Research Centers in Minority Institutions (RCMI) International Symposium on Health Disparities*, Tennessee, December 6-9, 2010.
 43. Verma S, **Kumar M**, Roe K and Nerurkar VR. WNV alters junctional complexes of the blood-brain barrier. *12th RCMI International Symposium on Health Disparities*, Tennessee, December 6-9, 2010.
 44. Nerurkar VR, **Kumar M** and Verma S. WNV-induced cyclooxygenase-2 promotes inflammation in astrocytes. *12th RCMI International Symposium on Health Disparities*, Tennessee, December 6-9, 2010.
 45. Chapagain ML, Lazaga NB, **Kumar M**, Volper E, Cropp BS, Shah PA, Verma S and Nerurkar VR. Minocycline protects against WNV-associated encephalitis in mice. *12th RCMI International Symposium on Health Disparities*, Tennessee, December 6-9, 2010.
 46. **Kumar M**, Verma S, and Nerurkar VR. Pro-inflammatory cytokines derived from West Nile virus-infected neurons mediates neuroinflammation and neuronal death. *Society for Neuroscience (SfN) 40th Annual Meeting*, San Diego, November 13-17, 2010.
 47. Roe K, **Kumar M**, Nerurkar VR and Verma S. In vivo West Nile virus-induced disruption of the blood-brain barrier is characterized by the disruption of tight junction proteins and increase in matrix. *SfN 40th Annual Meeting*, San Diego, November 13-17, 2010.
 48. **Kumar M**, Verma S, and Nerurkar VR. Role of pro-inflammatory cytokines released from West Nile virus-infected neurons in mediating neuroinflammation and neuronal death. *ASV 29th Annual Conference*, Bozeman, Montana, July 17-21, 2010. (**ASV Travel Award**)
 49. Verma S, **Kumar M**, and Nerurkar VR. WNV-induced cyclooxygenase-2 (COX-2) in astrocytes is a critical modulator of inflammation. *Keynote Symposia on Cell Biology of Virus Entry, Replication and Pathogenesis*, Taos, New Mexico, February 16-21, 2010.

50. Verma S, **Kumar M**, and Nerurkar VR. West Nile virus-induced cyclooxygenase-2 (COX-2) in astrocytes is a critical modulator of neuroinflammation. *American Society of Tropical Medicine and Hygiene 58th annual meeting*, Washington, D.C., November 18-22, 2009.
51. **Kumar M**, Verma S, and Nerurkar VR. Cyclooxygenase-2 (COX-2)-induced from WNV-infected astrocytes is a critical modulator of mediators of blood-brain barrier (BBB) disruption. *ASV 28th Annual Conference*, Vancouver, BC, Canada, July 11-15, 2009. (**ASV Travel Award**)
52. **Kumar M**, Verma S, Lo YY, Chapagain M, Gurjav U, Lum S, Lo H, Tanaka A, and Nerurkar VR. West Nile virus (WNV) infection modulates human brain micro-vascular endothelial (HBMVE) cells tight junction proteins (TJP) and cell adhesion molecules (CAM): Transmigration across the in-vitro blood-brain barrier (BBB). *11th RCMI International Symposium on Health Disparities*, Honolulu, Hawai'i, December 1-4, 2008.
53. Verma S, **Kumar M**, Gurjav U, Lum S, and Nerurkar VR. Role of West Nile virus (WNV) induced matrix metalloproteinases (MMP) in disruption of the blood-brain barrier. *11th RCMI International Symposium on Health Disparities*, Honolulu, Hawai'i, December 1-4, 2008.

Local Conference & Symposium Presentations (#Student author)

1. Arora K, [Natekar JP[#]](#), Rothan HA, **Kumar M**. MicroRNA regulation of Zika virus Infection. 2019 Georgia Bio Innovation Summit, Atlanta, October 8, 2019.
2. [Natekar JP[#]](#), [Strate PG[#]](#), Rothan HA, Arora K, and **Kumar M**. Z-DNA-binding protein in West Nile virus encephalitis. 2019 Georgia Bio Innovation Summit, Atlanta, October 8, 2019.
3. [Stone S[#]](#), [Azouz F[#]](#), Nerurkar VR, and **Kumar M**. Congenital Zika syndrome in guinea pigs. 2019 Georgia Bio Innovation Summit, Atlanta, October 8, 2019.
4. Rothan HA, Arora K, and **Kumar M**. Multiplexed digital gene expression profiling of West Nile virus neurovirulence in C57BL/6J and C57BL/6N mouse models. 2019 Georgia Bio Innovation Summit, Atlanta, October 8, 2019.
5. [Stone S[#]](#), [Azouz F[#]](#), Nerurkar VR, and **Kumar M**. A guinea pig model of Zika virus disease. *2019 Biomedical Sciences Symposium*, JABSOM, UHM, April 25-26, 2019.
6. [Vuong C[#]](#), [Azouz F[#]](#), [Kutscher S[#]](#), Nerurkar VR and **Kumar M**. Zika Virus detection in urine and saliva of pregnant guinea pigs. *2018 Biomedical Sciences Symposium*, JABSOM, UHM, April 18-19, 2018.
7. [Krause K[#]](#), [Azouz F[#]](#), Nakano E, Nerurkar VR and **Kumar M**. Alpha-macroglobulins deficient mice are resistant to lethal flavivirus encephalitis. *2018 Biomedical Sciences Symposium*, JABSOM, UHM, April 18-19, 2018.
8. [Azouz F[#]](#), [Krause K[#]](#), [Ching L[#]](#), Nerurkar VR, and **Kumar M**. Function of Schlafen4 in the pathogenesis of flavivirus encephalitis. *2018 Biomedical Sciences Symposium*, JABSOM, UHM, April 18-19, 2018.
9. [Azouz F[#]](#), [Krause K[#]](#), [Ching L[#]](#), Nerurkar VR, and **Kumar M**. A novel role of Schlafen4 in West Nile virus replication and pathogenesis. *2017 Biomedical Sciences Symposium*, JABSOM, UHM, April 20-21, 2017.
10. [Krause K[#]](#), [Azouz F[#]](#), Nakano E, Nerurkar VR and **Kumar M**. A guinea pig model of Zika virus infection. *2017 Biomedical Sciences Symposium*, JABSOM, UHM, April 20-21, 2017.
11. **Kumar M**, Melish M, and Nerurkar VR. Zika-virus associated microcephaly in Hawaii. *2017 Biomedical Sciences Symposium*, JABSOM, UHM, April 20-21, 2017.
12. Elisara T, Ching L, **Kumar M**, Astern J, and Nerurkar VR. Comparison of commercially available Zika Virus serodiagnostic assays. *2017 Biomedical Sciences Symposium*, JABSOM, UHM, April 20-21, 2017.
13. [Krause K[#]](#), [Azouz F[#]](#), Nakano E, Nerurkar VR and **Kumar M**. A guinea pig model of Zika virus infection. *American Society for Microbiology (ASM)-Ha'wai'i Branch, Spring Meeting*, Honolulu, April 15, 2017.

14. [Azouz F[#]](#), [Krause K[#]](#), [Ching L[#]](#), Nerurkar VR, and **Kumar M**. A novel role of Schlafen4 in West Nile virus replication and pathogenesis. *ASM-Ha'wai'i Branch, Spring Meeting*, Honolulu, April 15, 2017.
15. [Ching L[#]](#), Shin OK, [Hughes L[#]](#), Nerurkar VR, and **Kumar M**. Virus-induced Schlafen genes and their role in replication and pathogenesis. *2016 Biomedical Sciences Symposium*, JABSOM, UHM, April 21-22, 2016.
16. Nerurkar VR, Belciad M, and **Kumar M**. Identification of host genes leading to West Nile virus encephalitis in mice brain using RNA-Seq analysis. *2016 Biomedical Sciences Symposium*, JABSOM, UHM, April 21-22, 2016.
17. [Hughes L[#]](#), Nerurkar VR, and **Kumar M**. Expression and regulatory effects of Schlafen genes in flavivirus infection. *ASM-Ha'wai'i Branch, Spring Meeting*, Honolulu, April 11, 2016.
18. [Kyung Moo Kim[#]](#), Olivia Achonduh, Diane W. Taylor, Vivek R. Nerurkar, Kenji O. Mfuh, and **Kumar M**. Biomarkers of Fever: Expression of Cytokines and CRP Levels in Febrile Patients. *2015 SACNAS Regional Meeting*, UHM, April 17-19, 2015.
19. [Kyung Moo Kim[#]](#), Olivia Achonduh, Diane W. Taylor, Vivek R. Nerurkar, Kenji O. Mfuh, and **Kumar M**. Biomarkers of Fever: Expression of Cytokines and CRP Levels in Febrile Patients. *2015 Biomedical Sciences Symposium*, JABSOM, UHM, April 15-17, 2015.
20. **Kumar M**, and Nerurkar VR. Defining cause-and-effect relationships between virus replication, infiltration of immune cells, and production of inflammatory mediators in mouse models of West Nile virus-associated neuroinflammation. *2015 Biomedical Sciences Symposium*, JABSOM, UHM, April 15-17, 2015.
21. **Kumar M**, O'Connell, M, and Nerurkar VR. Differential antiviral, inflammatory and pathological responses in lethal and non-lethal West Nile virus infections in mice. *2014 Biomedical Sciences Symposium*, JABSOM, UHM, April 3-4, 2014.
22. Lazaga NB, **Kumar M**, and Nerurkar VR. Progressive multifocal leukoencephalopathy: Development of a human polyomavirus JC infection model using humanized mice. *2013 Biomedical Sciences Symposium*, JABSOM, UHM, April 8-9, 2013.
23. **Kumar M**, Roe K, Nerurkar PV, Orillo B, Thompson KS, Verma S, and Nerurkar VR. Reduced immune cell infiltration and increased neuroinflammation in type 2 diabetic mice infected with West Nile virus. *2013 Biomedical Sciences Symposium*, JABSOM, UHM, April 8-9, 2013.
24. **Kumar M**, and Nerurkar VR. Integrated analysis of microRNAs induced by West Nile virus infection and their disease related targets in mouse brain. *2013 Biomedical Sciences Symposium*, JABSOM, UHM, April 8-9, 2013.
25. **Kumar M**, Roe K, Nerurkar PV, Namekar M, Orillo B, Verma S, and Nerurkar VR. Diabetes as a risk factor for West Nile virus associated encephalitis. *ASM-Ha'wai'i Branch, Spring Meeting*, Honolulu, April 21, 2012. **(First Prize, Oral Presentation)**
26. **Kumar M**, Roe K, Nerurkar PV, Namekar M, Orillo B, Verma S, and Nerurkar VR. Impaired virus clearance, compromised immune response and increased mortality in type 2 diabetic mice infected with West Nile virus. *2012 Biomedical Sciences Symposium*, JABSOM, UHM, April 17-18, 2012.
27. Namekar M, **Kumar M**, O'Connell, M, and Nerurkar VR. Optimization of West Nile virus E-protein microsphere immunoassay for enhanced detection of anti-WNV IgM AND -IgG antibodies in mice. *2012 Biomedical Sciences Symposium*, JABSOM, April 17-18, 2012.
28. Roe K, **Kumar M**, Orillo B, Nerurkar VR, and Verma S. Inflammasome sensor apoptosis-associated speck-like protein containing CARD (ASC) restricts West Nile virus infection and spread to the central nervous system. *2012 Biomedical Sciences Symposium*, JABSOM, UHM, April 17-18, 2012.
29. **Kumar M**, Roe K, Lum S, Orillo B, Nerurkar VR, and Verma S. Role of Nod-like receptor protein 3 (NLRP3) inflammasome in West Nile virus-induced neuroinflammation. *ASM-Hawai'i Branch, Spring Meeting*, Honolulu, April 23, 2011. **(First Prize, Oral Presentation)**

30. **Kumar M**, Verma S, and Nerurkar VR. Cyclooxygenase (COX) enzymes and prostaglandin E2 (PGE2) modulate West Nile virus (WNV)-induced neuroinflammation, and regulate the production of neuroinflammatory molecules including matrix metalloproteinases (MMP). *2011 Biomedical Sciences Symposium*, JABSOM, UHM, April 19-20, 2011.
31. Roe K, **Kumar M**, Lum S, Orillo B, Nerurkar VR and Verma S. In vivo West Nile virus-infection modulates the markers of blood-brain barrier disruption. *2011 Biomedical Sciences Symposium*, JABSOM, UHM, April 19-20, 2011.
32. **Kumar M**, Verma S, and Nerurkar VR. Cyclooxygenase-2 (COX-2) inhibitor blocks the production of West Nile virus-induced neuroinflammatory markers in astrocytes. *ASM-Hawai'i Branch, Spring Meeting*, Honolulu, April 24, 2010. **(First Prize, Oral Presentation)**
33. Chapagain M, Lazaga N, **Kumar M**, Verma S, and Nerurkar VR. Minocycline treatment improves survival of mice infected with West Nile virus. *2010 Biomedical Sciences Symposium*, JABSOM, UHM, April 13, 2010.
34. **Kumar M**, Verma S, and Nerurkar VR. Pro-inflammatory cytokines derived from West Nile virus-infected neurons mediates neuroinflammation and neuronal death. *2010 Biomedical Sciences Symposium*, JABSOM, UHM, April 13, 2010.
35. Roe K, **Kumar M**, Verma S, and Nerurkar VR. In vivo West Nile virus-induced disruption of the blood-brain barrier is characterized by the disruption of tight junction proteins and increase in matrix metalloproteinases. *2010 Biomedical Sciences Symposium*, JABSOM, UHM, April 13, 2010.
36. Verma S, **Kumar M**, and Nerurkar VR. Role of astrocytes derived cyclooxygenase-2 (COX-2) in modulating neuroinflammation in West Nile virus infection. *2010 Biomedical Sciences Symposium*, JABSOM, UHM, April 13, 2010.
37. **Kumar M**, Verma S, and Nerurkar VR. Pro-inflammatory cytokines derived from West-Nile virus-infected neurons mediates neuroinflammation and neuronal death. *ASM-Hawai'i Branch, Spring Meeting*, Honolulu, April 20, 2009. **(First Prize, Oral Presentation)**
38. **Kumar M**, Verma S, Lo YY, Chapagain M, Gurjav U, Lum S, Lo H, Tanaka A, and Nerurkar VR. West Nile virus (WNV) infection modulates human brain micro-vascular endothelial (HBMVE) cells tight junction proteins (TJP) and cell adhesion molecules (CAM): Transmigration across the in-vitro blood-brain barrier (BBB). *2009 Biomedical Sciences Symposium*, JABSOM, UHM, April 14, 2009.
39. Verma S, **Kumar M**, Gurjav U, Lum S, and Nerurkar VR. Role of West Nile virus (WNV) induced matrix metalloproteinases (MMP) in disruption of the blood-brain barrier (BBB). *2009 Biomedical Sciences Symposium*, JABSOM, UHM, April 14, 2009.

Peer Reviewer for Scientific Journals

ad hoc reviewer for numerous journals including Nature Communications, PLoS Pathogens, PLoS Pearls, PLoS Neglected Tropical Diseases, Frontiers in Microbiology, ASC Infectious Disease, Frontiers in Immunology, Nature Scientific Reports, PLoS One, Viruses, Virology, Journal of Virology, Journal of Neurovirology, Virology Journal, Pathogens, Future Virology, F1000 Research, Vaccine, eNeurologicalSci, PeerJ, Viral Immunology, Intervirology, Journal of Medical Virology, Bioscience Reports, Clinical and Experimental Neuroimmunology, International Journal of Molecular Sciences, Diagnostic Microbiology and Infectious Disease, Pharmaceutics, Tropical Medicine.

Editor of Scientific Journals

Frontiers in Microbiology, Pathogens

RESEARCH SUPPORT
Ongoing Research Support

R21OD024896 (Kumar) 10/01/17-09/30/21
NIH/OD Total Cost: \$402,325
A guinea pig model of Zika virus disease
Role: Principal Investigator

R21NS099838 (Kumar) 12/01/16-11/30/20
NIH/NINDS Total Cost: \$423,500
Defining the function of Schlafen4 in the pathogenesis of flavivirus encephalitis
Role: Principal Investigator

Defense Advanced Research Projects Agency (Brinton and Kumar) 10/01/20-09/30/22
Cas13a RNA based therapy against emerging viruses Total Cost: \$400,000
Role: It is a sub-contract from Georgia Institute of Technology from a multi-year DARPA grant.
The goal of this grant is to test novel Cas-13 based therapeutics against emerging viruses including, SARS-CoV-2 and Flaviviruses using in vitro cell culture and mouse model.

2034498 (Wang, Department of Chemistry, GSU) 09/01/20-08/30/21
NSF Total Cost: \$200,000
RAPID: Microelectrode Array Sensors for SARS-CoV-2 and Other RNA Viruses
Role: Co-Investigator

1R33CA235319-01A1 (Yang, Department of Chemistry, GSU) 10/01/20-09/30/21
NIH/NCI Total Cost: \$100,000
Non-invasive Detection of SARS-CoV-2
Role: Co-Investigator

Molecular Biology of the Disease Grant 04/01/21-12/30/21
Georgia State University Total Cost: \$20,000
Pathogenesis of Powassan virus infection
Role: Principal Investigator

Completed Research Support

Molecular Biology of the Disease Grant 07/01/20-12/31/20
Georgia State University Total Cost: \$25,000
Pilot Project: Neuropathogenesis of Powassan virus
Role: Principal Investigator

U19-AI-131130 07/01/19-06/30/20
NIH/NIGMS Total Cost: \$38,625
Center for Engineering a Human Brain Organoid-based Platform to Study Neurotropic Viruses
Pilot Project: MicroRNA Regulation of Neurotropic Flavivirus Infections
Role: Principal Investigator

Molecular Biology of the Disease Seed Grant 01/01/20-06/30/20
Georgia State University Total Cost: \$25,000
Pilot Project: Towards point of care diagnostics for flavivirus detection

Role: Principal Investigator

HCF 12337 (Kumar)

Hawaii Community Foundation

Defining the function of MicroRNAs associated with Zika virus neurological disease

Role: Principal Investigator

07/01/18-12/31/19

Total Cost: \$50,000

0000 (Chul-Jung, Kim and Sarah Shin, University of Korea Medical School)

Transgovernmental Enterprise for Pandemic Influenza in Korea (TEPIK)

Ministry of Health and Welfare

Basic research on H5N8 influenza virus pathogenesis

Role: Co-Investigator

08/01/14-07/30/19

Total Cost: \$1,200,000

5T37MD008636-05 (Taylor, University of Hawaii)

NIH/NIMHD

International Biomedical Research Training for Hawaiian & Pacific Island Students

The goal is to train minority students to conduct summer research.

Role: Mentor

12/01/13 – 11/30/18

Total Cost: \$1,250,000

5P30GM114737-03 (Yanagihara)

NIH/NIGMS

Pathogenesis of Asian and African Zika virus strains

Role: Principal Investigator

07/01/17-06/30/18

Total Cost: \$40,000

5P30GM114737-03 (Yanagihara)

NIH/NIGMS

Pathogenesis of Zika virus infection

Role: Principal Investigator

06/30/17-11/30/17

Total Cost: \$25,000

5P30GM114737-02 (Yanagihara)

NIH/NIGMS

Defining the function of Schlafen4 in the pathogenesis of flavivirus encephalitis

Role: Principal Investigator

06/30/16-11/30/16

Total Cost: \$30,000

5P30GM114737-02 (Yanagihara)

NIH/NIGMS

Guinea pig model of Zika virus infection

Role: Principal Investigator

07/01/16-06/30/17

Total Cost: \$50,000

5P30GM114737-01 (Yanagihara)

NIH/NIGMS

Characterization of SLFN4-dependent neuroimmune response associated with WNVE

Role: Principal Investigator

08/15/15-06/30/16

Total Cost: \$50,000

5P30GM114737-03 (Yanagihara)

NIH/NIGMS

Pacific Center for Emerging Infectious Diseases Research

Center for Biomedical Research Excellence (COBRE)

The goal of this COBRE proposal is to augment and strengthen the infectious diseases-related research capacity at the University of Hawaii and to expand and develop biomedical faculty

07/01/15-06/30/20

Total Cost: \$5,800,000

research capability and enhance research infrastructure through support of a multi-disciplinary infectious disease program.

Role: Associate Director Biocontainment Core

5P20GM103516-10 (Yanagihara)

07/01/10-06/30/15

NIH/NIGMS

Pacific Center for Emerging Infectious Diseases Research

Role: Associate Director, BSL-3/ABSL-3 Core Facility

TEACHING, TRAINING, MENTORING

Instructional Activities (Georgia State University)

Instructor and Course Coordinator

Spring 2021 BIOL 4575/6575 (Virology), (4 credit course), Number of Students: 70
Fall 2020 BIOL 4575/6575 (Virology), (4 credit course), Number of Students: 78
Spring 2020 BIOL 8700 (Biology Seminar), (2 credit course), Number of Students: 52
Fall 2019 BIOL 4575/6575 (Virology), (4 credit course), Number of Students: 53
Spring 2019 BIOL 8700 (Biology Seminar), (2 credit course), Number of Students: 32

Instructional Activities (University of Hawaii)

Instructor and Course Coordinator

Fall 2017 TRMD 672 (Advanced Medical Virology), (2 credit course)
Fall 2016 TRMD 672 (Advanced Medical Virology), (2 credit course)
Spring 2016 TRMD 605 (Infectious Disease Microbiology II: Virology), (3 credit course)
Fall 2015 TRMD 672 (Advanced Medical Virology), (2 credit course)

Co-instructor

Spring 2018 TRMD 609 (Advances in Medical Immunology), (3 credit course)
Spring 2018 TRMD 608 (Infectious Disease Microbiology III: Bacteriology), (3 credit course)
Spring 2018 TRMD 605 (Infectious Disease Microbiology II: Virology), (3 credit course)
Fall 2017 TRMD 610 (Infection and Immunity), (3 credit course)
Fall 2017 TRMD 604 (Immunology and Immunopathogenesis), (2 credit course)
Summer 2017 MEDT 591 (Medical Technology), Clinical Training Didactic Sessions
Spring 2017 TRMD 608 (Infectious Disease Microbiology III: Bacteriology), (3 credit course)
Spring 2017 TRMD 605 (Infectious Disease Microbiology II: Virology), (3 credit course)
Fall 2016 TRMD 604 (Immunology and Immunopathogenesis), (2 credit course)
Summer 2016 MEDT 591 (Medical Technology), Clinical Training Didactic Sessions
Spring 2016 TRMD 608 (Infectious Disease Microbiology III: Bacteriology), (3 credit course)
Spring 2016 TRMD 609 (Advances in Medical Immunology), (3 credit course)
Fall 2015 TRMD 610 (Infection and Immunity), (3 credit course)
Fall 2015 TRMD 604 (Immunology and Immunopathogenesis), (2 credit course)
Summer 2015 MEDT 591 (Medical Technology), Clinical Training Didactic Sessions
Spring 2015 TRMD 605 (Infectious Disease Microbiology II: Virology), (3 credit course)
Spring 2015 TRMD 608 (Infectious Disease Microbiology III: Bacteriology), (3 credit course)
Fall 2014 TRMD 604/PH665 (Immunology & Immunopathogenesis), (2 credit course)
Summer 2014 MEDT 591 (Medical Technology), Clinical Training Didactic Sessions
Spring 2014 TRMD 605 (Infectious Disease Microbiology II: Virology), (3 credit course)
Spring 2014 MICR 625/TRMD 609 (Advances in Medical Immunology), (3 credit course)
Spring 2014 TRMD 608 (Infectious Disease Microbiology III: Bacteriology), (3 credit course)
Fall 2013 TRMD 672 (Advanced Virology), (2 credit course)
Summer 2013 MEDT 591 (Medical Technology), Clinical Training Didactic Sessions

Guest Lectures

Spring 2017 PH666, Seminars in Infectious Disease Control
Fall 2016 MD6 (Infections of the Nervous System)
Spring 2016 PH666, Seminars in Infectious Disease Control
Fall 2015 M490 (Virology), (3 credit course)
Fall 2015 MD6 (Infections of the Nervous System)
Spring 2015 PH666, Seminars in Infectious Disease Control
Fall 2014 M490 (Virology), (3 credit course)
Fall 2014 MD6 (Infections of the Nervous System)
Spring 2014 PH666, Seminars in Infectious Disease Control
Fall 2013 MD6 (Infections of the Nervous System)

Directed Research (Georgia State University):

BIOL 6900 (Directed Lab Study), Summer 2021, Number of Students: 8
BIOL 8800 (Directed Research), Summer 2021, Number of Students: 8
BIOL 6900 (Directed Lab Study), Spring 2021, Number of Students: 8
BIOL 8800 (Directed Research), Spring 2021, Number of Students: 8
BIOL 6900 (Directed Lab Study), Fall 2020, Number of Students: 7
BIOL 8800 (Directed Research), Fall 2020, Number of Students: 7
BIOL 6900 (Directed Lab Study), Summer 2020, Number of Students: 7
BIOL 8800 (Directed Research), Summer 2020, Number of Students: 7
BIOL 6900 (Directed Lab Study), Spring 2020, Number of Students: 7
BIOL 8800 (Directed Research), Spring 2020, Number of Students: 7
BIOL 6900 (Directed Lab Study), Fall 2019, Number of Students: 6
BIOL 8800 (Directed Research), Fall 2019, Number of Students: 6
BIOL 6900 (Directed Lab Study), Summer 2019, Number of Students: 6
BIOL 8800 (Directed Research), Summer 2019, Number of Students: 6
BIOL 8800 (Directed Research), Spring 2019, Number of Students: 3
BIOL 6900 (Directed Lab Study), Spring 2019, Number of Students: 3
BIOL 8800 (Directed Research), Fall 2018, Number of Students: 3
BIOL 6900 (Directed Lab Study), Fall 2018, Number of Students: 3

Directed Research (University of Hawaii):

TRMD 699 (Directed Research), Spring 2018, Number of Students: 4
TRMD 699 (Directed Research), Fall 2017, Number of Students: 3
TRMD 699 (Directed Research), Spring 2017, Number of Students: 2
TRMD 699 (Directed Research), Fall 2016, Number of Students: 1
TRMD 699 (Directed Research), Spring 2016, Number of Students: 1
CMB 699 (Directed Research), Spring 2016, Number of Students: 1
TRMD 499 (Directed Research), Fall 2015, Number of Students: 3
TRMD 499 (Directed Research), Spring 2015, Number of Students: 2
TRMD 499 (Directed Research), Fall 2014, Number of Students: 1

Students

Primary Advisor to Graduate Students (#Current Student)

Name	University	Degree	Duration	Current Affiliations
Shannon Stone [#]	UHM and GSU	MS and PhD	2018-	PhD student at GSU
Philip Strate [#]	GSU	PhD	2018-	PhD student at GSU
Janhavi Natekar [#]	GSU	MS and PhD	2018-	PhD student at GSU

Tabassum Aurani [#]	GSU	PhD	2019-	PhD student at GSU
Heather Pathak [#]	GSU	PhD	2019-	PhD student at GSU
Pratima Kumari [#]	GSU	PhD	2019-	PhD student at GSU
Huyen Nguyen [#]	GSU	MS	2020-	MS student at GSU
Kelly Lopez [#]	GSU	MS	2021-	MS student at GSU
Keeton Krause	UHM	MS	2016-18	Microbiologist, Hawaii Department of Health
Francine Azouz	UHM	MS	2016-18	Microbiologist, Hawaii Department of Agriculture
Meghan Rondel	GSU	MS	2018-20	Microbiologist, Biotech Company, Atlanta
Hassan Rhbiny	GSU	MS	2019-20	Microbiologist, NY city Hospital
Anastasia Kondakova	GSU	MS	2019-20	Graduated
Saada Musa	GSU	MS	2020-21	Graduated
Karishma Saini	GSU	MS	2020-21	Graduated

Undergraduate Student Mentees

Name	Home Institution	Duration
Sanjana Sarker	GSU	2019-21
Edwin Somer Belle	GSU	2019-21
Landon Negrillo	UHM	Summer 2018
Cindy Wong	UHM	2018
Michael Faundo	UHM	Summer 2017
Ernest Puletasi	UHM	2016-17
John Ngo	UHM	Summer 2016
Ross Takemoto	UHM	2015-17
Taneesha Asing	UHM	Summer 2015
Laura Hughes	UHM	2014-16
Hilario Franco	UHM	2014-15
Kyung Moo Kim	UHM	2014-15

Participation in Thesis/Dissertation Committees

Name	University	Degree/Position	Year
Amany Elsharkawy	GSU	Ph.D.	2021-
Rahul Basu	GSU	Ph.D.	2020-
Shaligram Sharma	GSU	Ph.D.	2020-
Noopur Bhatnagar	GSU	Ph.D.	2020-
Emilio Espinola	GSU	Ph.D.	2019-
Ayisha Allison McIntyre	GSU	Ph.D.	2019-
Destiny Mythe Hutchinson	GSU	B.S. (Honors)	2019
Cindy Wong	UHM	B.S. (Honors)	2018
Carissa Nakao	UHM	B.S. (Honors)	2016

Priyanka Gupta	University of Sydney, Australia	Ph.D.	2014
Zachary D. Acker	UHM	B.S. (Honors)	2014

Department Qualifying Exam Committee:

- Rahul Basu
- Lanqiao Xiong
- Jay Joo Young Oh

SERVICE & COMMUNITY ACTIVITIES

Professional Service

2021- Grant Reviewer, NIH Virology B Study Section
2021 Grant Reviewer, Austrian Science Fund (FWF)
2020 Grant Reviewer, NIH Special Emphasis Panel ZAI1-FDS-W-S1
2020 Grant Reviewer, NIH Special Emphasis Panel ZAI1 JP-W S2
2020 Grant Reviewer, NIH Special Emphasis Panel 202105 ZRG1 AIDC K83
2020 Grant Reviewer, NIH Special Emphasis Panel ZRG1 AIDC-B (07) S).
2020 Grant Reviewer, COVID Discovery panel, US Department of Defense, Congressionally Directed Medical Research Programs.
2018-19 Grant Reviewer, Natural Sciences and Engineering Research Council of Canada, Discovery Grants Review.
2019 Chairperson, Panel 1, OASH/Office of Minority Health/Hepatitis B Demonstration Grant Program, Food and Drug Administration
2018-19 Grant Reviewer, Pacific Center for Emerging Infectious Diseases Research, Center for Biomedical research Excellence, University of Hawaii
2018-19 Grant Reviewer, BioNexus KC Review, Oak Ridge Associated Universities
2018 Grant Reviewer, Israel Science Foundation
2017-18 Grant Reviewer, Office of Chief Scientist Intramural grant program in Food and Drug Administration
2017 Grant Reviewer, 2017 RMATRIX-II Collaboration Pilot Projects Program
2017 Scientific Reviewer, Proposals for Center for Collaborative Research in Health Disparities at the University of Puerto Rico Medical Sciences Campus
2017 Abstract Reviewer, American Society for Microbiology Microbe Meeting 2017
2016 Scientific Reviewer, RMATRIX-II Pilot Projects Letters of Intent
2016 Grant Reviewer, Florida Department of Health Zika Review 2016
2016-19 Grant Reviewer, Northern Pacific Global Health (NPGH) program grant applications
2016-17 President, American Society for Microbiology (ASM)-Hawai'i Branch
2015- National Pacific Global Health Research Fellows Training Consortium Interviewer and Application Reviewer
2015-16 President-Elect, American Society for Microbiology (ASM)-Hawai'i Branch
2014-19 Grant Reviewer, Mountain West Clinical Translational Research-Infrastructure Network, National Institute of Health
2013-15 Secretary, American Society for Microbiology (ASM)-Hawai'i Branch
2012-13 President, ASM-Hawai'i Branch (Student Chapter)

University Service (Georgia State University)

2021- Faculty Mentor, Biology Graduate Students Association

2020- Department of Biology Student Awards Committee
 2019- Voting Member, GSU Institutional Animal Care and Use Committee
 2019 Judge, GSU Annual Research Symposium
 2018- Department of Biology Student Qualifying Exam Committee
 2018 Judge, 2018 Fall Molecular Biology of Disease Annual Symposium

University Service (University of Hawaii)

2017-18 Member, University of Hawaii Research Ethics Committee
 2014-18 Member, Institutional Biosafety Committee
 2016 Judge, 2016 Fall Undergraduate Showcase, University of Hawai'i at Mānoa
 2015-18 MHIRT Application Reviewer and Program Interviewer
 2015-18 Reviewer, Undergraduate Research Opportunities Program, University of Hawai'i
 2015 Judge, CTAHR/COE Student Research Symposium, University of Hawai'i
 2015-16 Judge, Spring Forum, University of Hawai'i at Mānoa Honors Program & Undergraduate Research Opportunities Program
 2015-18 Graduate examination committee, Tropical Medicine Graduate program
 2014-18 Medical School (JABSOM) Applicant Interviewer
 2014-17 Faculty Reviewer, Spring Associated Students of University of Hawai'i Scholarship
 2014-17 Judge, Biomedical Science Symposium, JABSOM
 2013-17 Faculty Reviewer, Fall Associated Students of University of Hawai'i Scholarship
 2013-17 Judge, Spring Forum, University of Hawai'i at Mānoa Honors Program & Undergraduate Research Opportunities Program
 2012 Judge, Leeward Community College Science and Engineering Fair

Membership in Professional Associations

2019- International Society for NeuroVirology
 2015- Subject Matter Expert, American Medical Technologists
 2013- International Society for Infectious Diseases
 2013- American Association of Immunologists
 2012 Society on Neuroimmune Pharmacology
 2012- American Society for Microbiology
 2012-14 Federation of Clinical Immunology Societies
 2010 Society for Neuroscience
 2009-18 American Society for Microbiology-Hawai'i Branch
 2009- American Society for Virology

PROFESSIONAL GROWTH

Honors and Awards

2021- College of Arts and Sciences Outstanding Junior Faculty Award, GSU
 2021- Nominated for the 2021 Blavatnik National Awards for Young Scientists by GSU
2020- My lab was highlighted in Spring 2020 issue of GSU research magazine
 2018- Graduate Faculty Member, Department of Biology, GSU
 2016 American Association of Immunologists Early Career Faculty Award
 2016-18 Graduate Faculty Member, Neuroscience Program, UHM
 2015-18 Graduate Faculty Member, Department of Cell and Molecular Biology, UHM
 2015 American Society for Virology Travel Award
 2014-18 Graduate Faculty Member, Department of Tropical Medicine, UHM
 2013 Joseph E. Alicata Award in Tropical Medicine and Infectious Disease

2013	American Society for Virology Travel Award
2013	American Association of Immunologists Travel Award
2012-13	Department of Tropical Medicine Achievement Award
2012	Dai Ho Chun Travel Fellowship (UH Foundation)
2012	Society on Neuroimmune Pharmacology Young Investigator Travel Award
2010	Research Corporation of University of Hawai'i Appreciation Award for Research Achievements
2010	Nominated by the University of Hawai'i for 2010-2011 Western Association of Graduate Schools (WAGS) and University Microfilms International (UMI) Distinguished Master's Thesis Award
2010	Selected by WAGS as one of the five finalists for 2010-2011 WAGS and UMI Distinguished Master's Thesis Award
2009-11	American Society for Microbiology-Hawai'i Branch Travel Award
2009-10	Graduate Student Organization, UHM, Travel Award
2009-10	American Society for Virology Travel Award
2009-12	First Prize (Oral Presentation), American Society for Microbiology-Hawai'i Branch, Spring Meeting

Press Articles and Interviews

- 5 mysteries about COVID-19 that scientists must solve to end COVID-19 Pandemic. Association of American Medical Colleges. March 11, 2021.
- COVID-19 attack on Brain, not lungs, triggers severe disease in mice: Highlighted in Daily Mail, Axios, NewYork Post, Atlanta Journal Constitution, WSB-TV, 11 ALIVE, CBS, FOX and Newsweek.
This research was covered by more than 100 media outlets. Altmetric Score: 1085 (In the top 5% of all research outputs scored by Altmetric)
<https://mdpi.altmetric.com/details/97986361>
- Researchers at GSU developing new COVID-19 test that gives results in just minutes. WSB-TV. July 23, 2020.
- Georgia State Faculty Get COVID-19 Funding To Develop Coronavirus Test Tools. GSU News. July 22, 2020.
- Research at warp speed: Urgent, personal, frightening. Association of American Medical Colleges. May 26, 2020.
- COVID-19 Daily: Reusing Masks, Imaging Guidance. Medscape. April 20, 2020.
- Cytokine Storms May Be Fueling Some COVID Deaths. WebMD. April 17, 2020.
- Researchers find rheumatoid arthritis drug is promising coronavirus treatment: Highlighted in NewYork Post, Atlanta Journal Constitution, Washington Examiner, Atlanta Magazine, Georgia Public Radio, WSB-TV and 11 ALIVE.
This research was covered by more than 50 media outlets (In the top 5% of all research outputs scored by Altmetric).
- GSU Researchers Identify Protein That Could Unlock West Nile, Zika Virus Treatments. Georgia public Radio. November 7, 2019.
This research was covered by several media outlets (In the top 5% of all research outputs scored by Altmetric).
- Scientists discover cell protein crucial in preventing viral replication. The Medical News. November 6, 2019.

- Can one protein open the door to West Nile and Zika treatments? Medical News Today. November 7, 2019.
- Preventing Zika from being transmitted to fetus is goal of new NIH grant to Hawaii. Press Release. University of Hawaii Cancer Center. September 27, 2017.
- Grant to UH researcher will boost studies of Zika. Press Release. Honolulu Star-Advertiser. September 19, 2017.
- Interested in how MILLIPLEX® MAP assays can further Zika research? On Demand Webinar with Dr. Mukesh Kumar. September 1, 2017.
- Zika virus research advanced by new guinea pig model. Video Interview with Dr. Mukesh Kumar. Select Science. August 10, 2017.

This research was covered by several media outlets (In the top 5% of all research outputs scored by Altmetric).

- Zika research at University of Hawai'i medical school in the spotlight at "Select Science". Press Release. UH News Now. July 24, 2017
- UH medical school research finds Zika virus-infected mothers delivered babies with microcephaly here as early as 2009. Press Release. UH Med Now. December 28, 2016
- UH scientist funded to find effective treatment for brain inflammation from West Nile, other viruses. Press Release. UH News Now. October 24, 2016