

Dr. Anand Kumar, DVM, PhD.

Staff Scientist-2
 Group B-10: Biosecurity and Public Health, Bioscience Division.
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Education

PhD	Comparative Veterinary Medicine	The Ohio State University, USA	2015
MS	Comparative Veterinary Medicine	The Ohio State University, USA	2012
MVSc	Animal Biotechnology	G. B. Pant Univ. of Agri. and Tech, India	2007
DVM	Veterinary Medicine	University of Agri. Sciences, India	2004

Research Experience and Employment

- 1) **Staff Scientist-2:** Bioscience division, Los Alamos National Lab 2019 - present
Projects: (I) Intestinal Barrier, Probiotic Bacteria, and the Gut-Liver Axis (II) A high-throughput (RapidPhage) platform for the discovery of lytic bacteriophages against pathogens (III) Developing a unique technology to control emerging threats of antibiotic-resistant pathogens (e.g., *Clostridium difficile*, Methicillin-resistant *Staphylococcus aureus*-MRSA), (IV) RealGut: A Bioengineering Platform to Explore and Combat AMR
- 2) **Director's Postdoc Fellow:** Los Alamos National Lab. Advisor: Patrick Chain 2017 – 2019
Projects: (I) Developing a unique technology to control emerging threats of antibiotic-resistant pathogens (e.g., *Clostridium difficile*, Methicillin-resistant *Staphylococcus aureus*-MRSA).
- 3) **University of California Davis/LANL Entrepreneurial Fellow:** Advisor: Jerome Garcia 2017 - 2018
Projects: (I) Bugs as drugs: A universal gut microbial cocktail to treat *Clostridium difficile* infections in humans.
- 4) **Postdoctoral Research Associate:** Los Alamos National Lab. Advisor: Momo Vuyisich 2016 - 2017
Projects: (I) Using therapeutic bacterial cocktail to treat human disease-LDRD ER.
- 5) **Graduate Research Associate (PhD):** The Ohio State Univ. Advisor: Gireesh Rajashekara 2012-2015
Projects: (I) *In vivo* gut transcriptome responses to *Lactobacillus rhamnosus* GG and *Lactobacillus acidophilus* in a neonatal gnotobiotic piglet model (Dissertation topic) (II) Impact of diet and rotavirus infection on infant microflora in humanized piglet model (Dissertation topic) and (III) Colonization dynamics and succession of defined commensal microflora in gnotobiotic pigs challenged with human virulent rotavirus.
- 6) **Graduate Research Associate (MS):** The Ohio State Univ. Advisor: Gireesh Rajashekara 2010-2012
Projects: (I) Functional characterization of inorganic polyphosphate catabolic enzymes (exopolyphosphates: PPX) of *Campylobacter jejuni* (Dissertation topic) and (II) High-throughput screening to identify novel anti-campylobacter compounds using a pre-selected enriched small molecules library.
- 7) **Veterinary Officer (VO):** Dept. of Animal Husbandry, Govt of Karnataka, India 2007-2010
 Deputy Director: Dr. Prasad Murthy
Job Descriptions: (I) Diagnosis and treatment of disease in small and large animals in hospital settings and in farms (II) Seroprevalence and monitoring of infectious disease outbreaks (Foot and mouth disease, Anthrax, Sheep pox and Bird flu) in animals (III) Postmortem examination of wild animals (elephant, monkeys and wild buffalo).
- 8) **Senior Research Fellow (SRF):** Institute of Animal Health and Veterinary Biologicals (IAH&VB), India. 2007
 Advisor: Dr. S. M. Byregowda
Projects: (I) Evaluation of immunologic response to a recombinant DNA vaccine and recombinant BCG vaccines in bovines for control of bovine tuberculosis.
- 9) **Research Fellow (MVSc):** G.B. Pant Univ. of Agri. & Tech., India. Advisor: Dr. M.K. Saxena 2005-2007
Projects: (I) Molecular typing of field isolates of *Salmonella* by RAPD (Random Amplified Polymorphic DNA) PCR (Thesis topic), and (II) Detection and isolation of *Salmonella* serovars from river Ganga water samples.

10) **Veterinary Intern (DVM):** Univ. of Agri. Sciences, India. Advisor: Dr. Madhav Prasad 1999-2004

Projects: (I) Detection of antibiotic residues in fortified milk and meat samples using *Bacillus subtilis* as a test organism, **(II)** Detection of thermo-stability of antibiotics in milk and meat using *Bacillus subtilis* as a test organism, and **(III)** Submitted a dissertation on “Use of un-conventional feeds and fodders in dairy farming” to fulfill the requirements for DVM.

Area of Specialization and Technical Skills

Host / microbe interactions

- Experience in integrated microfluidics platform like encapsulation of known number of bacterial cells in gel microdroplets (GMDs) and microdroplets (MDs), and flow sorting of desirable bacterial population in GMDs
- Experience in analyzing gut microbiome that includes, sample and library preparation for Miseq, 16s sequence analysis (by Mothur & QIIME) and downstream analysis of microbiome data
- Proficient in functional or phenotypic identification and characterization of defined commensal microflora using culturing and PCR related techniques (TRFLP; Terminal Restricted Fragment Length Analysis)
- Competence in exploring transcriptome data using Ingenuity Pathway Analysis (IPA) tool and data validation by qPCR and ability to conduct numerous cell culture experiments including rotavirus infection and detection by immunofluorescence method.

Bacterial pathogenesis and molecular epidemiology

- Expertise in different molecular biological tools including cloning, mutant generation, Western blot, TLC (Thin Layer Chromatography) including various other essential microbiological techniques
- Conceptualization and design of *in vivo* experimental studies in (germ-free, specific pathogen free, and conventional) animals
- Skills in molecular epidemiological tools like PFGE (Pulse Field Gel Electrophoresis), MLST (Multi-locus Sequence Typing) and data analysis using BioNumerics tool

Antimicrobial discovery

- Designing *in vitro* high throughput screening experiments and identifying small molecules hits and downstream filtering
- Knowledge about SciFinder tool and SAR (Structural Activity Relationship) analysis and testing potential lead hits in *in vivo* settings

Computer proficiency

- Proficient in Microsoft Office, Mac iOS and Linux based terminal, Endnote, GraphPad prism, Minitab and other relevant tools

Peer Reviewed Publications (H-index: 17, I-index: 21, Cumulative citations: 663+)

<https://scholar.google.com/citations?user=HzKMaIYAAAAJ&hl=en>

- 1) **Kumar A**, Helmy Y, Fritts Z, Vlasova A, Saif L, and Rajashekara G. Anti-rotavirus properties and mechanisms of selected Gram-positive and Gram-negative probiotics in polarized HT-29 cells. *Probiotics and Antimicrobial Proteins* (in review)
- 2) Arruda AG, Deblais L, Hale V, Pairis-Garcia M, Srivastava V, Kathayat D, **Kumar A**, and Rajashekara G. A cross-sectional study of the nasal and fecal microbiota of sows from different health status within six commercial swine farms. *PeerJ* (in review)
- 3) LeBrun ES, Nighot M, Dharmaprakash V, **Kumar A**, Lo C, Chain P, and Ma TY. Ethanol treatment in a chronic plus binge model of alcoholic liver disease drives consistent and identifiable shifts in gut microbiota of mice. *Life* 2021, 11(1), 7; <https://doi.org/10.3390/life11010007>
- 4) Rawat M, Kadian K, Gupta Y, **Kumar A**, Chain P, Kovbasnjuk O, Kumar S, and Parasher G. MicroRNA in pancreatic cancer: from biology to therapeutic potential. *Genes*. 2019, 10(10), 752. doi.org/10.3390/genes10100752
- 5) Yang F, **Kumar A**, Davenport K, Kelliher J, Ezeji J, Good C, Jacobs M, Conger M, West G, Fiocchi C, Cominelli F, Dichosa A, and Rodriguez-Palacios A. Complete genome sequence of a Parabacteroides distasonis strain (CavFT hAR46) isolated from a gut wall-cavitating microlesion in a patient with severe crohn's disease. *Microbiol Resour Announc*. DOI: 10.1128/MRA.00585-19
- 6) Alhmoud T, **Kumar A**, Lo C, Al-Sadi R, Clegg S, Alomari I, Zmeili T, Gleasner C, Mcmurry K, Dichosa A, Vuyisich M, Chain P, Mishra S, and Ma TY. Investigating intestinal permeability and gut microbiota roles in acute coronary syndrome patients. *Human Microbiome Journal*. doi.org/10.1016/j.humic.2019.100059

- 7) Deblais L, Helmy Y, **Kumar A**, Antwi J, Kathayat D, Acuna U, Huang H, Blanco E, Fuchs J, and Rajashekara G. Novel narrow spectrum benzyl thiophene sulfonamide derivatives as growth inhibitors of *Campylobacter*. *Journal of Antibiotics*. 2019 Mar 27. doi: 10.1038/s41429-019-0168-x
- 8) **Kumar A**, Davenport K, Vuyisich G, Kunde Y, Johnson S, Dichosa A, Chain P, and Rodriguez- Palacios A. The Complete genome sequence of historic *Clostridioides difficile* food-dwelling ribotype strain 078 in Canada is identical to historic human clinical strain M120 in the United Kingdom. *Microbiol Resour Announc* 7:e00853-18. <https://doi.org/10.1128/MRA.00853-18>.
- 9) **Kumar A**, Vlasova A, H Huang, Kandasamy S, Fischer D, Shao L, Langel S, Rauf A, Saif L, and Rajashekara G. Impact of diet and/or rotavirus infection on human infant microflora in humanized piglet model. *BMC Gastroenterol*. 2018 Jun 22;18(1):93. doi: 10.1186/s12876-018-0810-2.
- 10) H Huang, Vlasova AN, **Kumar A**, Kandasamy S, Fischer D, Shao L, Langel S, Rauf A, Saif L, and Rajashekara G. Effect of antibiotic, probiotic, and human rotavirus infection on colonization of defined commensal microflora in a gnotobiotic (Gn) pig model. *Beneficial Microbes*. 2018 Jan 29;9(1):71-86. doi: 10.3920/BM2016.0225. Epub 2017 Oct 12.
- 11) Helmy Y, Kassem I, **Kumar A**, and Rajashekara G. The effect of the probiotic *E. coli* strain Nissle 1917 on *Campylobacter jejuni*'s interaction with HT-29 human colonic cells. *Frontiers in Microbiology*. 22 August 2017 | <https://doi.org/10.3389/fmicb.2017.01588>.
- 12) Fischer D, Kandasamy S, Shao L, Langel S, Rauf A, **Kumar A**, Huang H, Rajashekara G, Saif L, and Vlasova A. Protein malnutrition alters tryptophan and angiotensin converting enzyme 2 homeostasis and impairs adaptive immune responses in gnotobiotic pigs transplanted with human infant fecal microbiota and infected with human rotavirus. *Clinical and Vaccine Immunology*. 2017 Aug 4;24(8). pii: e00172-17. doi: 10.1128/CVI.00172-17.
- 13) Kassem I, Kehinde O, **Kumar A**, and Rajashekara G. Non-culturability might underestimate the occurrence of *Campylobacter* in broiler litter. *Foodborne Pathogens and Diseases*. 2017 Aug;14(8):472-477. doi: 10.1089/fpd.2017.2279.
- 14) Kandasamy S, Vlasova A, Fischer D, Chattha K, Shao L, **Kumar A**, Langel S, Rauf A, Huang H, Rajashekara G, and Saif L. Unraveling the differences between Gram-positive and Gram-negative probiotics in modulating protective immunity to human rotavirus infection in animal models and children. *Front in Immuno*. 2017 Mar 27;8:334. doi: 10.3389/fimmu.2017.00334.
- 15) Vlasova A, Paim F, Kandasamy S, Fischer D, Langel S, **Kumar A**, Alhamo M, Chepngeno J, Shao L, Huang H, Rajashekara R, and Saif L. Effects of protein deficiency in neonatal gnotobiotic pigs on human rotavirus infection, innate immunity and gene expression by intestinal epithelial cells. *mSphere*, 2017 Mar 1;22. DOI: 10.1128/mSphere.00046-17.
- 16) Paim F, Langel S, Fischer D, Kandasamy S, Shao L, Abdulhameed M, Huang H, **Kumar A**, Rajashekara G, Saif L, and Vlasova A. Effects of *Escherichia coli* Nissle 1917 and ciprofloxacin on small intestinal epithelial cell mRNA expression in the neonatal piglet model of human rotavirus infection. *Gut Pathogens*, 2016 Dec 13;8:66. doi: 10.1186/s13099-016-0148-7.
- 17) Kassem I, Kehinde O, **Kumar A**, and G Rajashekara. Antimicrobial resistant *Campylobacter* in organically and conventionally raised layer chickens. *Foodborne Pathogens and Diseases*, 2016 Sep 22. doi: 10.1089/fpd.2016.2161. Epub 2016 Sep 22.
- 18) **Kumar A**, Gangaiah D, Torrelles J, and Rajashekara G. Polyphosphate and associated enzymes as global regulators of stress response and virulence in *Campylobacter jejuni*. *World J Gastroenterol*, Sept 7, 2016; 22:33. doi: 10.3748/wjg.v22.i33.7402.
- 19) Vlasova A, Shao L, Kandasamy S, Fischer D, Rauf A, Langel S, Chattha K, **Kumar A**, Huang H, Rajashekara G, and Saif L. *Escherichia coli* Nissle 1917 protects gnotobiotic pigs against human rotavirus by modulating plasmacytoid dendriticpDC and natural killer NK- cell responses. *Eur J Immunol*. 2016 Jul 26. doi: 10.1002/eji.201646498. Epub 2016 Aug 11.
- 20) **Kumar A**, Drozd M, Pina-Mimbela R, Xu X, Helmy Y, Antwi J, Fuchs J, Nislow C, Templeton J, Blackall P, and Rajashekara G. Novel anti-campylobacter compounds identified using high throughput screening of a pre-selected enriched small molecules library. *Front Microbiol*. 2016 Apr 6;7:405. doi: 10.3389/fmicb.2016.00405.
- 21) Kandasamy S, Vlasova A, Fischer D, **Kumar A**, Chattha K, Rauf A, Shao L, Langel S, Rajashekara G, Saif L. Differential effects of *Escherichia coli* Nissle and *Lactobacillus rhamnosus* strain GG on human rotavirus binding, infection, and B cell immunity. *J Immunol*. 2016 Feb 15;196(4):1780-9. doi: 10.4049/jimmunol.1501705. Epub 2016 Jan 22.
- 22) Kashoma I, Kassem I, **Kumar A**, Kessy B, Gebreyes W, Kazwala R, and Rajashekara G. Antimicrobial resistance and genotypic diversity of *Campylobacter* isolated from pigs, dairy, and beef cattle in Tanzania. *Front Microbiol*. 2015 Nov 12;6:1240. doi: 10.3389/fmicb.2015.01240.

- 23) * Pina-Mimbela R, Arcos J, **Kumar A**, Torrelles J, and Rajashekara G. Polyphosphate kinases modulate the *Campylobacter jejuni* outer material composition altering its capacity to invade and survive in intestinal epithelial cells *in vitro*. *Emerg Microbes Infect.* 2015 Dec 30;4(12):e77. doi: 10.1038/emi.2015.77 * Selected as an editorial.
- 24) Xu X, **Kumar A**, Deblais L, Pina-Mimbela R, Nislow C, Fuchs J, Miller S, and Rajashekara G. Discover novel small molecules to control *Clavibacter michiganensis* subsp. *michiganensis* using a high-throughput screening approach. *Front Microbiol.* 2015 Oct 19;6:1127. doi: 10.3389/fmicb.2015.01127.
- 25) **Kumar A**, Vlasova A, Liu Z, Chattha K, Kandasamy S, Esseili M, Zhang X, Saif L, and Rajashekara G. *In vivo* gut transcriptome responses to *Lactobacillus rhamnosus* GG and *Lactobacillus acidophilus* in a neonatal gnotobiotic piglet model. *Gut Microbes* 2014 Mar-Apr;5(2):152-64. doi: 10.4161/gmic.27877. Epub 2014 Jan 22.
- 26) ***Malde A**, Gangaiah D, Chandrashekhar K, Pina-Mimbela R, Torrelles J, and Rajashekara G. Functional characterization of exopolyphosphatase/guanosine pentaphosphate phosphohydrolase (PPX/GPPA) of *Campylobacter jejuni*. *Virulence.* 2014 May 15;5(4):521-33. doi: 10.4161/viru.28311
* Selected as an editorial.
- 27) Kashoma I, **Kumar A**, Sanad Y, Gebreyes W, Kazwala R, Garabed R, and Rajashekara G. Phenotypic and genotypic diversity of thermophilic *Campylobacter* spp. in commercial turkey flocks: a longitudinal study. *Foodborne Pathogens and Diseases.* Dec 2014;11(12):917-9. doi: 10.1089/fpd.2014.1794. Epub 2014 Sep 3.
- 28) Mollenkopf D, Cenera J, Bryant E, King C, Kashoma I, **Kumar A**, Funk J, Rajashekara G, and Wittuma T. Impact of organic or antibiotic-free labeling on the recovery of enteric pathogens and antimicrobial-resistant *Escherichia coli* from fresh retail chicken. *Foodborne Pathogens and Diseases*, 2014 Dec;11(12):920-9. doi: 10.1089/fpd.2014.1808.
- 29) *Annamalai T, Pina-Mimbela R, **Kumar A**, Binjawadagi B, Renukaradhya G, and Rajashekara G. Evaluation of nanoparticle encapsulated OMPs for the control of *Campylobacter jejuni* colonization in chickens. *Poultry Science.* 2013 Aug;92(8):2201-11. doi: 10.3382/ps.2012-03004. * Highlighted in world poultry forum.
- 30) Sanad Y, Closs G, **Kumar A**, LeJeune J, and Rajashekara R. Molecular epidemiology and public health relevance of *Campylobacter* isolated from dairy cattle and European starlings in Ohio, USA. *Foodborne Pathogens and Diseases.* 2013 Mar;10(3):229-36. doi: 10.1089/fpd.2012.1293. Epub 2012 Dec 21.
- 31) **Kumar A** and Saxena M. Molecular typing of field isolates of *Salmonella* Seroovar by using RAPD-PCR. *Indian Journal of Animal Science.*80:3 March 2010.
- 32) **Kumar A**, Wodeyar K, and Saxena M, 2007. STEM CELL - Prospects in Veterinary Medicine. Pashudhanu Monthly Magazine from Natural Remedies Pvt. LTD. India.

In prep

- 33) **Anand Kumar**, G Vuyisich, A. Dichosa *et al.*, High throughput microbiome screening (HTMS) platform to interrogate complex microbial communities.
- 34) **Anand Kumar**, G Vuyaschi, A. Dichosa *et al.*, Gifu modified broth to recover and culture the most bacterial communities from the healthy human fecal samples.
- 35) **Anand Kumar et al.**, Genomic insight into first pathogenic *C. difficile* strain isolated from the infant.
- 36) **Anand Kumar**, Z Fritts, LJ Saif and G Rajashekara *et al.* Investigation of selected Gram-positive and Gram-negative probiotic's anti-rotavirus activities in human colonic (polarized HT-29) cells.
- 37) **Anand Kumar** and G Rajashekara *et al.* High-throughput screening to identify novel target specific (TAT system) anti-campylobacter compounds using small molecules library.

Book Chapters

- 1) Kassem I, Kehinde O, Helmy Y, Pina-Mimbela R, **Kumar A**, Chandrashekhar K, and Rajashekara G. *Campylobacter* in poultry: the conundrums of highly adaptable and ubiquitous foodborne pathogens. Book title: "Foodborne diseases: Case studies of outbreaks in the agri-food industries." Editors: Jan Mei Soon, Louise Manning and Carol A. Wallace. Publisher: CRC Press, Date of publication: March 18, 2016.
- 2) Kandasamy S, **Kumar A**, G Rajashekara, Vlasova A, and Saif L. Probiotics for immunomodulation and treatment of immunological disorders in children: Evaluation in a germ-free animal model. Book title: "Probiotics in Children" Editors: Marco Manfredi and Gian Luigi de'Angelis. Nova Science Publishers, Date of publication: Thursday 03 September 2015.

Patents

- 2020: Title of invention: Novel small molecule antimicrobials. Inventors: Rajashekara G, **Kumar A** et al. Status: Approved, US patent# US20200299259A1
Significance: Narrow spectrum antimicrobials, less likely to induce resistance in bacteria, unlikely to affect normal gut microflora.
- 2020: Title of invention: A high-throughput (RapidPhage) platform for the discovery of lytic bacteriophages against pathogens. Inventors: **Kumar A** et al., Status: Filing provisional patent application. *Significance:* Rapid discovery, isolation and characterization of novel lytic phages against pathogen.
- 2018: Title of invention: High throughput microbiome screening (HTMS) platform for industrial applications. Inventors: **Kumar A** et al., Status: Filing provisional patent application.
Significance: Provides millions of independent microenvironment & characterize their interactions, and overcome limitations associated with conventional microbiological techniques.
- 2018: Title of invention: Novel antimicrobials to control *Campylobacter*. Inventors: Rajashekara G, **Kumar A** et al., Application No IDF891329, Status: Patent approval pending
Significance: Narrow spectrum antimicrobials, known mechanism, less likely to induce resistance in bacteria, unlikely to affect normal gut microflora

Honors and Awards

- 2020: **The Secretary of Energy Achievement Award** for COVID-19 clinical testing
- 2020: **Spot Award** in recognition of contributions to accomplishing LANL mission
- 2018: Science-in-3 min, **Outstanding Presenter** (among preselected 27 presenters across LANL divisions)
- 2017: Univ. of California Davis/LANL **Entrepreneurial Fellow** (4 out of 400 postdocs)
- 2017: **Director's Postdoc Fellow** Los Alamos National Laboratory (<5% of top postdoc receive this award)
- 2014: Nominated for **Presidential Fellowship** from College of Veterinary Medicine, The Ohio State University in 2014 (one in 60 graduate students)
- 2014: First author paper selected as **An Editorial** Anandkumar Malde et al., *Virulence* 2014; 5(4):521-33
- 2012: **Best Poster Award (1st place)**, The annual Ohio Agricultural Research Development Center (OARDC) research conference, Wooster (among 40+ graduate students)
- 2012: **Travel Grant Award**, Graduate student oral presentation, North Central Avian Disease Conference (NCADC), MN, USA (among 25+ graduate students)
- 2012: **Qualified** as Biological Section poster presenter (20 out of 680 posters submitted), Edward F. Hayes Graduate Research Forum, The Ohio State University, Columbus, OH, USA
- 2004: **21st Rank** in All India Entrance Examination for Admission to Post-graduate Studies conducted by the Indian Council of Agricultural Research, New Delhi, India. (Highly competitive)
- 2004: **A Trophy of Appreciation** by Dairy Science Club, Dharwad, India for securing top rank at National level post-graduate entrance exam. (5 out of 60 students)
- 2003: **Best Poster Award (1st place)**, National Seminar on Quality Upgradation and Safety Aspects of Dairy Products, Veterinary College, Bidar, India. (2 out of 60 students)

Fellowships and Financial Support

- 2018: Milton S. Hershey Medical Center | Penn State Health, Guest Speaker Honorarium \$1000
- 2017: UC Davis/LANL Entrepreneurial Fellowship. Amount: \$100K for six months
- 2017: Director's Postdoc Fellowship. Amount: \$300K for two years
- 2014: Ohio Agricultural Research and Development Center (OARDC) professional growth scholarship for attending scientific conference. Amount: \$500.00
- 2013: OARDC professional growth scholarship for attending scientific conference. Amount: \$500.00
- 2012: OARDC professional growth scholarship for attending scientific conference. Amount: \$500.00
- 2003: Financial assistance covering annual tuition fee and living expenses in DVM curriculum from Government of Karnataka, India. Amount: ≈ \$ 200.00
- 2002: Financial assistance covering annual tuition fee and living expenses in DVM curriculum from Government of Karnataka, India. Amount: ≈ \$ 200.00

Mentoring and Supervising Experience

- 2021: Nathan Cruz, postmaster student, Arizona State University, AZ
- 2021: George Andrew Abernathy, Black Hills State University, SD
- 2019: Kevin Martinez, undergraduate student, University of New Mexico, NM
- 2019: Michael Kron, Naval Academy, MD
- 2017-2018: Julia Mae Kelliher, (undergraduate student), Boston University, MA

- 2017: Jake Charles Harbour (undergraduate student), Washington State University, Pullman
 2017: Rachel Katherine Frankle (high school student), University of New Mexico, NM
 2015: Dipak Kathayat (graduate student), The Ohio State University, OH
 2015: Zilu Wan (graduate student), The Ohio State University, OH
 2015: Zachary Fritts (senior high school student), Wooster community high school, OH
 2014: Andrea Hershey (undergraduate student), The Ohio State University, OH
 2013-2014: Olugbenga O Kehinde (visiting scholar), Lecturer, Federal Univ. of Agri., Nigeria
 2012: Gokben Ozbey (visiting scholar), Assistant Professor, Firat Üniversitesi, Turkey
 2012: Serpil Baspinar (visiting scholar), Associate Professor, Firat Üniversitesi, Turkey
 2011-2013: Isaac Pastory Kashoma (visiting scholar), Lecturer, Sokoine Univ. of Agri., Tanzania

Professional Service (last three years)

- 2021 to: Editorial board, *BMC Microbiology*
 2020 to: Editorial board, *Journal of Functional Foods*
 2020 to: Editorial board, *Infectious Disease Reports*
 2020 to: Editorial board, *Epidemiologia*
 2020 to: Regional Editor, *Vaccines*
 2020 to: Reviewer, *journal of Fungi*
 2020 to: Reviewer, *mSystems*
 2020 to: Reviewer, *Nature Communications*
 2020 to: Reviewer, *International Journal of Environmental Research & public Health*
 2019 to: Reviewer, *BMC Microbiology*
 2019 to: Track chair, Microbiome & Probiotics Series: USA,
 2019 to: Reviewer, *Journal Nutrients*
 2019 to: Reviewer, *Journal of Functional Food*
 2019 to: Reviewer, *Veterinary Sciences*
 2019 to: Reviewer, *Frontiers in Immunology*
 2019 to: Reviewer, *Journal of Foods*
 2018 to: Reviewer, *Foodborne Pathogens and Diseases*

LANL Institutional Service (last two years)

- 2020: Deputy group leader search committee member
 2020: Designing Your Career: Biology Speakers
 2019: Hosted and Chaired, the Microbiome Research Meeting
 2019: Panel member, Service, Employment Redevelopment Event at Northern NM College
 2019: 3rd annual Bioscience Day committee chair
 2019: Judged, Annual Student Symposium, Reviewed 5 abstracts and posters
 2019: Invited speaker, Clinical Metagenomics, B-division NGS & Bioinformatics Workshop
 2018: Volunteered, UC-LANL entrepreneurial video recording event
 2018: Judged, Annual Student Symposium, Reviewed 5 abstracts and posters
 2018: Invited speaker, Clinical Metagenomics, B-division NGS & Bioinformatics Workshop
 2018: Invited speaker, Animal subjects in clinical trials, Santa Fe High School students
 2018: Volunteered, UC-LANL entrepreneurial promotional event

Professional Affiliations

- 2015 to present: The American Association for the Advancement of Science (AAAS)
 2014 to present: American Society for Microbiology (ASM)
 2016 to 2019: Member of Los Alamos Postdoc Association (LAPA)
 2010 to 2015: Grad Student Council, College of Veterinary Medicine, The Ohio State University
 2012 to 2015: OARDC Scholars Association, The Ohio State University, Wooster
 2012 to present: Conference of Research Workers in Animal Diseases (CRWAD)
 2004 to present: Member of Veterinary Council of India (VCI)
 2004 to 2010: Karnataka Veterinary Association (KVA)

Certifications and Licensure

- 1) National Eligibility Test (NET) for Assistant Professorship cleared two times (2005 and 2006) conducted by Council of Scientific and Industrial Research (CSIR) India. (Clearing % < 5.0)

- 2) The Agricultural Research Service (ARS)/National Eligibility Test (NET) for Assistant Professorship in state universities cleared two times (2007 and 2008) conducted by The Indian Council of Agricultural Research (ICAR). (Clearing % < 7.0)
- 3) Registered Veterinary Practitioner in India

Invited Talk

- 1) Integration and maintenance of UBPS inside the living cell. Workshop on Visualizing Living Systems, (virtual) Feb 25, 2021. (virtual)
- 2) RealGut: a bioengineered platform to assess astronaut health risks and develop personalized countermeasures. The Center for Space and Earth Science CSES (virtual lightning talk), Oct 26th, 2020.
- 3) Targeting Emerging Pathogen Infections with Next Generation Therapeutic Probiotics, Microbiome & Probiotics Series: USA, San Diego, CA, Oct 29-30th, 2019
- 4) Disrupting fecal transplant practice with a pill. Science in 3 min, LANL, June 13th, 2018
- 5) Anti-C.diff Pill. FedTech: Startup Studio DC, Location: Washington DC, Feb 15th, 2018
- 6) Tools to investigate gut microbiome. Hershey Medical Center, Penn State University, May 7-9th, 2018
- 7) Astro-Gut. 2nd Annual Bioscience Day, LANL Los Alamos, NM. Aug 22nd, 2018
- 8) Dif-Fix-Get Your Gut Back, UC-LANL entrepreneurial final presentation. July 5th, 2018.
- 9) Dif-Fix- Get Your Gut Back, Innovate New Mexico. May 31st, 2018.
- 10) Using therapeutic bacteria to treat human diseases. 1st Annual Bioscience Day, LANL-Los Alamos, NM. Sept 15th, 2017
- 11) Bugs as drugs: An universal gut microbial cocktail to treat *Clostridium difficile* (CDI) in humans. 3rd Annual DisrupTech, Los Alamos National Lab Launch Pad. Location: Los Alamos, NM. July 20th, 2017
- 12) Discovering a novel gut bacterial cocktail to treat *Clostridium difficile* (CDI) in humans. Division of Gastroenterology and Liver Disease, Case Western Reserve University, School of Medicine. Location: Cleveland, OH. May 4th, 2016
- 13) Probing species specific 'probiotics' and connecting dots between diet, infant gut flora and rotavirus disease. Bioscience Division, Los Alamos National Laboratory (LANL). Location: Los Alamos, NM. October 14th, 2015.
- 14) *In vivo* gut transcriptome responses to *Lactobacillus rhamnosus* GG and *Lactobacillus acidophilus* in a neonatal gnotobiotic piglet model. Conference of Research Workers in Animal Diseases (CRWAD), Chicago, IL. Dec 8-10 2013
- 15) Role of exopolyphosphatase/ guanosine pentaphosphate phosphohydrolase (PPX/GPPA) enzymes of *Campylobacter jejuni*. Conference of Research Workers in Animal Diseases (CRWAD), Chicago, IL. Dec 2-4 2012
- 16) Exopolyphosphatase/ guanosine pentaphosphate phosphohydrolase (PPX/GPPA) enzymes of *Campylobacter jejuni*. North Central Avian Disease Conference (NCADC), Saint Paul RiverCentre, MN. March 13-15 2012

Contributed Talk

- 1) Dichosa A et al., Genomics investigation of the human gut microbiome in microgravity using gel microdroplets and community cultivation strategies. The 10th annual International Space Station Research and Development Conference (ISSRDC), (Virtual). August 3 to 5, 2021.
- 2) Kandasamy S et al., Differential Effects of *Escherichia coli* Nissle and *Lactobacillus rhamnosus* strain GG on Human Rotavirus Infection and B Cell Responses. Society of Microbial Immunology, 2015
- 3) Kassem I et al., An evaluation of the impact of litter chemical amendments on reducing *Campylobacter jejuni* in broilers. Conference of research workers in animal disease (CRWAD), Chicago, IL. December 6-8, 2014
- 4) Saif L et al., Tailoring probiotics as immunomodulators to enhance neonatal mucosal immunity to rotavirus (RV) vaccines or alleviate RV diarrhea: Evaluation in a neonatal gnotobiotic piglet model. Conference of research workers in animal disease (CRWAD), Chicago, IL. December 6-8, 2014
- 5) Mollenkopf D et al., Impact of organic or antibiotic-free labeling on the recovery of enteric pathogens and antimicrobial-resistant *Escherichia coli* from fresh retail chicken. Conference of Research Workers in Animal Diseases (CRWAD), Chicago, IL. Dec 8-10 2013
- 6) Sanad Y et al., Genotypic and phenotypic properties of *Campylobacter* isolated from dairy cattle and European starlings in Ohio, USA. North Central Avian Disease Conference (NCADC), Saint Paul RiverCentre, MN. March 13-15 2012

Poster Presentations

1. Kumar A et al., Combating Antibiotic-Resistant Pathogens by Microbiome-Based Therapeutics. Defense Threat Reduction Agency's (DTRA) 2019 Chemical and Biological Defense Science & Technology (CBD S&T) Conference Cincinnati, Ohio. Nov 17-21st, 2019.
2. Kumar A et al., Discovering a defined universal therapeutic bacterial cocktail (DUTBC) to treat *C. difficile* infections in humans. Microbiome, Host Resistance and Disease Keystone Symposium. Banff, AL. Canada Mar 3-08, 2018.
3. Kumar A et al., Exploring microbial interactions to discover a therapeutic bacterial cocktail to treat recurrent *Clostridioides difficile* infections in humans. 3rd Annual Translational Microbiome Conference, Boston, MA April 11-13, 2017.
4. Kumar A et al., Poop to pill. Sandia National Laboratories Postdoctoral Technical Showcase. Sandia National Lab. Albuquerque, NM. Nov 8th, 2016.
5. Kumar A et al., Exploring interspecies interactions to discover a novel gut bacterial cocktail to treat antibiotic-resistant *Clostridium difficile* infection. Sequencing, Finishing, and Analysis in the Future Meeting 2016. La Fonda on the Plaza, Santa Fe, NM. June 1-3, 2016.
6. Kumar A et al., *E. coli* strain Nissle 1917 mitigates *Campylobacter jejuni* invasion and intracellular survival in HT-29 human colonic cells. 6th ASM conference on Beneficial Microbes. Seattle, Washington. 9 -12 September 2016.
7. Kumar A et al., Novel Quorum Sensing Inhibitors for the Control of Avian Pathogenic *E. coli*. OARDC Annual Research Conference. Ohio State University, Columbus, Ohio State, USA. 21st April 2016.
8. Kumar A et al., Quorum Sensing Inhibitors to Enhance the Control of Avian Pathogenic *E. coli*. The 65th Western Poultry disease conference, Vancouver, Canada. 24-27th April 2016.
9. Kumar A et al., Colonization dynamics and succession of defined commensal microflora in a gnotobiotic pigs challenged with human virulent rotavirus. OARDC Annual Research Conference, Nationwide 4-H & Ohio Farm Bureau Center, Columbus, OH. April 16 2015.
10. Kumar A et al., Differential effects of *E.coli* Nissle and *Lactobacillus rhamnosus* strain GG on human rotavirus infection and B cell responses. Society for Mucosal Immunology, Berlin, Germany, July 15, 2015
11. Kumar A et al., An evaluation of the impact of litter chemical amendments on reducing *Campylobacter jejuni* in broilers. General Meeting of the American Society for Microbiology-115th, Ernest N. Morial Convention Center New Orleans, LA. May 30- June 2, 2015.
12. Kumar A et al., An evaluation of the impact of litter chemical amendments on reducing *Campylobacter jejuni* in broilers. Conference of research workers in animal disease (CRWAD), Chicago, IL. December 6- 8, 2014.
13. Kumar A et al., Colonization dynamics and succession of defined commensal microflora in a gnotobiotic pigs challenged with human virulent rotavirus. Conference of research workers in animal disease (CRWAD), Chicago, IL. December 6- 8, 2014.
14. Kumar A et al., *Escherichia coli* Nissle 1917 colonization ameliorates human rotavirus diarrhea and modulates B cell responses in a neonatal gnotobiotic pig disease model. Immunology meeting, Pittsburg, PA. May 2- 6, 2014
15. Kumar A et al., *In vivo* gut transcriptome responses to *Lactobacillus rhamnosus* GG and *Lactobacillus acidophilus* in neonatal gnotobiotic piglets. ASM Conference on Beneficial Microbes, Omni Shoreham Hotel in Washington, DC. September 27-30, 2014
16. Kumar A et al., *In vivo* gut transcriptome responses to *Lactobacillus rhamnosus* GG and *Lactobacillus acidophilus* in a neonatal gnotobiotic piglet model. Public Health Preparedness for Infectious Diseases (PHPID) meeting, Biological Research Tower, Columbus, OH. May 30, 2013
17. Kumar A et al., 2012. Functional characterization of exopolyphosphatase/ guanosine pentaphosphate phosphohydrolase (PPX/GPPA) enzymes of *Campylobacter jejuni*. 20th Annual Midwest Microbial Pathogenesis Conference (MMPC), Columbus, OH. August 23-25, 2013
18. Kumar A et al., A Longitudinal study on *Campylobacter* spp. in commercial turkey flocks in northwest Ohio: phenotypic and genetic diversity. Second International Congress on Pathogens at the Human-Animal Interface (ICOPHA): One Health for Sustainable Development, Porto De Galinhas, Brazil. Aug 14-17, 2013
19. Kumar A et al., Prevalence, phenotypic and genotypic properties of *Campylobacter* species from turkeys. OARDC conference proceeding. April 26, 2012
20. Kumar A et al., Functional Characterization of Exopolyphosphatase/ Guanosine Pentaphosphate Phosphohydrolase (PPX/GPPA) Enzymes of *Campylobacter jejuni*. 2012 Edward F. Hayes Graduate Research Forum conference proceeding. Feb 24, 2012
21. Kumar A et al., Exopolyphosphatase/ Guanosine Pentaphosphate Phosphohydrolase (PPX/GPPA) Enzymes of *Campylobacter jejuni*. North Central Avian Disease Conference (NCADC) conference proceeding. March 13- 15, 2012

22. Nadoor, P., Prasad, M., Kumar A et al., Detection of thermostability of veterinary antibiotics in milk and meat using *Bacillus subtilis* as a test organism. National Seminar on Quality Upgradation and Safety Aspects of Dairy Products conference proceeding, India. January 2003
23. Nadoor, P., Prasad, M., Gangaiah, D., and Kumar A. Detection of antibiotic residues in fortified milk and meat samples using *Bacillus subtilis* as a test organism. National Seminar on Quality Upgradation and Safety Aspects of Dairy Products conference proceeding, India. January 2003

Outreach

- 1) Volunteered the Ohio State University Wooster campus booth at the Wayne County Fair
Place: Wooster, OH. Date: September 12 – 17, 2015
- 2) Organized numerous animal health camps (40 in number), farmers' awareness camp (03 in number), and dairy farming lectures (02 in number) in India. Place: Yelandur, KA. Date: During my tenure as a veterinary officer (2007-2010)
- 3) Volunteered as a head of Parasitology and Zoonosis section exhibit at the Veterinary College Bidar, India. During this exhibition, created awareness among senior high school students (approximately 300 students). Place: Bidar, KA. Date: September 2003