



Detailed Biodata

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- Institution: **Indian Institute of Technology Guwahati**
- Date of Birth: **January 05, 1980**
- Gender (M/F/T): **M**
- Category Gen/SC/ST/OBC: **Gen**
- Whether differently abled: **No**
- Academic Qualifications (Undergraduate onwards):

S. No.	Degree Awarded	Year	Subject	University/Institution	% of Marks
1	B.V.Sc and AH	2004	Veterinary and Animal Sciences	Govind Ballabh Pant University of Agriculture and Technology, Pantnagar, Uttaranchal, India	7.99 with distinction
2	M.V.Sc in Veterinary Public Health	2006	Veterinary Public Health	Indian Veterinary Research Institute, Izatnagar, UP, India	8.397
3	PhD , in Veterinary Medical Sciences	2010	Veterinary Medical Sciences	University of Maryland, College Park, USA	8.0

- Ph.D thesis title, Guides's Name, Insitution/organization/University, Year of Award:
Title: Characterization of *Borrelia Burgdorferi* gene products critical for pathogen persistence and transmission
Guides Name: Professor Utpal Pal, University of Maryland, College Park, USA, and Year: 2010
- Work experience (in chronological order)

S.No	Positions held	Name of the Institute	From	To	Pay Scale
1	Graduate Research Assistant	University of Maryland	2006	2010	27000 USD per annum
2.	Post-doctoral fellow	Johns Hopkins School of Medicine, Baltimore, USA	2011	2012	42000 USD per annum

3.	Assistant Professor	IIT Guwahati	2012	2017	8000+30000
4.	Associate Professor	IIT Guwahati	2017	2021	9500+42800
5.	Professor	IIT Guwahati	2021	onwards	10500+

11. Professional Recognition/Award/Prize/Certificate, Fellowship received by the applicant

S.No	Name of Award	Awarding agency	Year
1	ICAR-National talent scholarship	ICAR, New Delhi	1999-2004
2	University merit Scholarship	GBPUA&T, Pantnagar	2000-2004
3	ICAR-JRF	ICAR, New Delhi	2004-2006
4	Research assistant fellowship	University of Maryland, College Park, USA	2006-2010
5	Avrum Gudelsky Veterinary Graduate Student Award for exemplary graduate research in Veterinary Medicine	Virginia-Maryland Regional College of Veterinary Medicine, College Park, Maryland, USA	2010
5.	Post-Doctoral fellowship	Johns Hopkins School of Medicine, Baltimore, USA	2011-12
6.	SERB-Young Scientist Grant Award	DST-SERB	2013-2016

12. Publications (List of papers published in SCI Journals, in year-wise descending order).

1. Hota S and **Kumar M** "Unveiling the impact of *Leptospira* TolC efflux protein on host tissue adherence, complement evasion, and diagnostic potential," *Infection and Immunity*. DOI.10.1021/acsinfecdis.4c00266, Vol.92, , P.P - , (2024)
2. Hota S and **Kumar M** "ErpY-like protein interaction with host thrombin and fibrinogen intervene the plasma coagulation through extrinsic and intrinsic pathways," *ACS Infectious Diseases*. DOI: 10.1021/acsinfecdis.4c00266, Vol., , P.P - , (2024)
3. Kumari S, Ali A, **Kumar M** "Nucleotide-induced ClpC oligomerization and its non-preferential association with ClpP isoforms of pathogenic *Leptospira*", *International Journal of Biological Macromolecules*. DOI.10.1016/j.ijbiomac.2024.131371, Vol., , P.P - , (2024)
4. Kumari S, Dhara A, **Kumar M** "Leptospira ClpP mutant variants in association with the ClpX, acyldepsipeptide, and the trigger factor displays unprecedented gain-of-function", *International Journal of Biological Macromolecules*. DOI.https://doi.org/10.1016/j.ijbiomac.2023.127753, Vol., , P.P - , (2023)
5. Hussain MS, Anand V, **Kumar M** "Functional PAM sequence for DNA interference by CRISPR-Cas I-B system of *Leptospira interrogans* and the role of LinCas11b encoded within

- linCas8b", *International Journal of Biological Macromolecules*, DOI.https://doi.org/10.1016/j.ijbiomac.2023.124086, Vol.237, 124086, P.P 1-14 , (2023)
6. Anand V, Harshini SP, Gogoi P, Kanaujia SP and **Kumar M** "Structural and functional characterization of Cas2 of CRISPR-Cas subtype I-C lacking the CRISPR component", *Frontiers in Molecular Biosciences*, DOI.10.3389/fmolb.2022.988569 , Vol.988569, 9, P.P - 15 , (2022)
 7. Hussain MS, **Kumar M** "Assembly of Cas7 subunits of Leptospira on the mature crRNA of CRISPR-Cas I-B is modulated by divalent ions", *Gene*, DOI.10.1016/j.gene.2022.146244, Vol., , P.P - , (2022)
 8. Hota S, Hussain MS, **Kumar M** "ErpY-like lipoprotein of Leptospira outsmart host complement regulation by acquiring complement regulators, activating alternative pathways, and intervening in the membrane attack complex", *ACS Infectious Diseases*, DOI.10.1021/acsinfecdis.1c00602 , Vol.8, 5, P.P 982-997 , (2022)
 9. Prakash A, **Kumar M** "Transcriptional analysis of CRISPR I-B arrays of Leptospira interrogans serovar Lai and its processing by Cas6", *Front. Microbiol.*, DOI. 10.3389/fmicb.2022.960559 , Vol.13, 960559, P.P 1-13 , (2022)
 10. Dhara A, Hussain M S, Kanaujia S P, **Kumar M** "Acyldepsipeptide activated ClpP1P2 macromolecule of Leptospira, an ideal Achilles' heel to hamper the cell survival and deregulate ClpP proteolytic activity", *Research in Microbiology*, DOI.10.1016/j.resmic.2021.103797, Vol., , P.P - , (2021)
 11. Harshini S P, Ghosh K K, Kumari R R, Kumar P, **Kumar M** "Evaluation of sporozoite and macroschizont antigen (Spm2) of Theileria annulata for its diagnostic potential", *Ticks and Tick-borne Diseases*, DOI.https://doi.org/10.1016/j.ttbdis.2021.101691, Vol.12, 4, P.P - , (2021)
 12. Prakash A, **Kumar M** "Characterizing the transcripts of Leptospira CRISPR I-B array and its processing with endoribonuclease LinCas6", *International Journal of Biological Macromolecules*, DOI.10.1016/j.ijbiomac.2021.04.066, Vol.182, , P.P 785-795 , (2021)
 13. Dixit B, Anand V, Hussain M S, **Kumar M** "The CRISPR-associated Cas4 protein from Leptospira interrogans demonstrate versatile nuclease activity", *Current Research in Microbial Sciences*, DOI.10.1016/j.crmicr.2021.100040, Vol.2, 100040, P.P - , (2021)
 14. Kumar P, Kumar P, Roy R K, Kumari R R, Kumar A, Sarma K, Sharma P, **Kumar M** "Mixed Infection of Tick-borne Haemo-parasites in Water Buffalo and Associated Pathological Responses and Treatment", *Indian Journal Of Animal Research*, DOI.10.18805/IJAR.B-4450 , Vol., , P.P 1-9 , (2021)
 15. Dixit B, Prakash A, Kumar P, Gogoi P, **Kumar M** "The core Cas1 protein of CRISPR-Cas I-B in Leptospira shows metal-tunable nuclease activity", *Current Research in Microbial Sciences*, DOI.10.1016/j.crmicr.2021.100059, Vol., 2, P.P - , (2021)
 16. Kumar P, Kumari RR, Devi S, Tripathi MK, Singh J, Kumar R, **Kumar M** "Emergence and transboundary spread of lumpy skin disease in South Asia", *Indian Journal Of Animal Sciences*, DOI., Vol.7, 91, P.P 507-517 , (2021)

17. Kumar P, Kumari R R, Kumar A, Raman R K, Chandran P C, **Kumar M** "Status of Subclinical Mastitis in Crossbred Cattle of Peri-urban Unorganized Herd of Middle Indo-gangetic Plains.", *Indian Journal of Animal Research*, DOI.10.18805/IJAR.B-4241, Vol., , P.P - , (2020)
18. Choudhury M, Dhara A and **Kumar M** "Trigger factor in association with the ClpP1P2 heterocomplex of *Leptospira* promotes protease/peptidase activity", *ACS Omega*, DOI.10.1021/acsomega.0c05057, Vol., , P.P - , (2020)
19. Saha G, Chiranjivi AK, Khamar BM, Prerna K, **Kumar M** and Dubey VK " BLIMP-1 Mediated Downregulation of TAK1 and p53 Molecules Is Crucial in the Pathogenesis of Kala-Azar. ", *Front. Cell. Infect. Microbiol.*, DOI.10.3389/fcimb.2020.594431, Vol.10, 594431, P.P - , (2020)
20. Ghosh K K *, Prakash A *, Dhara A , Hussain M S , Shrivastav P , Kumar P , Balamurugan V, **Kumar M.** (2019) Evaluating the moonlight role of supramolecule ErpY-like lipoprotein of *Leptospira* in thrombin-catalyzed fibrin clot inhibition, binding to complement factors H & I, and its diagnostic potential, *Infection and Immunity*. Vol.87, 12, P.P e00536-19-e00536-19 ,
21. Saha G, Khamar B, Kumari P, **Kumar M**, Dubey V. (2019) BLIMP-1 plays important role in the regulation of macrophage pyroptosis for the growth and multiplication of *Leishmania donovani*. *ACS Infectious Diseases* Dhara A, Hussain M S, Datta D, **Kumar M.** (2019) Insights to the assembly of functionally active leptospiral ClpP1P2 protease complex along with its ATPase chaperone ClpX. *ACS Omega*. Vol.4, P.P 12880-12895.
22. Kumari R K, Kumar R, Kumar P, **Kumar M.** (2019) Emergence and variations in disease ecology of tick-borne bovine theileriosis in East India, *International Journal of Livestock Research* .doi:10.5455/ijlr.20190920061236,
23. Ghosh K K, Prakash A, Shrivastav P, Balamurugan V, **Kumar M.** (2018). Evaluation of a novel outer membrane surface exposed protein, LIC13341 of *Leptospira*, as adhesin and serodiagnostic candidate marker for leptospirosis. *Microbiology*. doi: 10.1099/mic.0.000685.
24. Kumar P, Barari S K, Tripathi M K, Kumari R K, **Kumar M.** (2018). Foot and Mouth Disease: An Economically Devastating Disease of the Livestock. *Journal of Veterinary Sciences*; 4(1): 9-12.
25. Kumar P, Dey A, Kumar A, Ray P K, Chandran P C, Kumari R K, **Kumar M.** (2018). The effects of PPR on the reproductive health of Black Bengal goats and the possible role played by oxidative stress. *Tropical Animal Health and Production*; <https://doi.org/10.1007/s11250-018-1578-7>.
26. Ghosh K K, Prakash A, Balamurugan V, **Kumar M.** (2018). Catecholamine modulated novel surface exposed adhesin LIC20035 of *Leptospira* binds host extracellular matrix components and is recognized by host during infection. *Applied and Environmental Microbiology*; 84 (6): e02360-17.
27. Singh P, Verma D, Backstedt B T, Kaur S, **Kumar M**, Smith A A, Sharma K, Yang X, Azevedo JF, Gomes-Solecki M, Buyuktanir O, Pal U. (2017). *Borrelia burgdorferi* BBI39 paralogs are targets of protective immunity inducing microbicidal responses and reducing pathogen persistence either in hosts or in the vector. *J Infect Dis*. Jan 31. doi:10.1093/infdis/jix036.

28. Dixit B, Ghosh K K, Fernandes G, Kumar P, Gogoi P, **Kumar M.** (2016). Dual nuclease activity of a Cas2 protein in CRISPR-Cas subtype I-B of *Leptospira interrogans*. *FEBS Lett*; 590 (7): 1002-16.
29. Kumar P, Kumari RK, **Kumar M**, Kumar S, Chakrabarti A. (2014). Current practices and research updated on Diabetes mellitus in Canine. *Veterinary World*; 7(11): 952-959.
30. Ouyang Z, Narasimhan S, Neelakanta G, **Kumar M**, Pal U, Fikrig E, Norgard MV.(2012). Activation of the RpoN-RpoS regulatory pathway during the enzootic life cycle of *Borrelia burgdorferi*. *BMC Microbiology*; 44 (12) doi: 10.1186/1471-2180-12-44.
31. **Kumar M**, Kaur S, Kariu T, Yang X, Bossis I, Anderson JF, Pal U. (2011). *Borrelia burgdorferi* BBA52 is a potential target for transmission blocking Lyme disease vaccines. *Vaccine*; 29 (48): 9012– 9019.
32. Xiao S*, **Kumar M***, Yang X, Akkoyunlu M, Collins P L, Samal S K, Pal U. (2011). An efficient avian host-restricted viral vector for antigen-specific host immunization against Lyme disease pathogens. *Vaccine*; 29 (32):5294-303. (* equal contribution)
33. **Kumar M**, Bhilegaonkar K N, Agarwal R K. (2011). Prevalence and characterization of rotavirus from faecal samples of children and animals. *Indian Journal of Animal Sciences*; 81(10): 993–999.
34. Kumari R R, **Kumar M**, Kumar P. (2011). An Integrated Approach to Control *Toxocara vitulorum*: A Major Cause of Buffalo Calf Mortality. *Livestock International*; 15 (2):8-9.
35. **Kumar M**, Yang X, Coleman A S, Pal U. (2010). BBA52 facilitates *Borrelia burgdorferi* transmission from feeding ticks to murine hosts. *J Infect Dis*; 201 (7): 1084-1095.
36. Zhang X, Yang X, **Kumar M**, Pal U. (2009). BB0323 function is essential for *Borrelia burgdorferi* virulence and persistence through tick-rodent transmission cycle. *J Infect Dis*; 200 (8):1318-30.
37. Promnares K, **Kumar M**, Shroder D Y, Zhang X, Anderson J F, Pal U. (2009). *Borrelia burgdorferi* small lipoprotein Lp6.6 is a member of multiple protein complexes in the outer membrane and facilitates pathogen transmission from ticks to mice. *Mol Microbiol*; 74 (1):112-25.
38. Ouyang Z, **Kumar M**, Kariu Toru, Haq S, Goldberg M, Pal U, Norgard M V. (2009). BosR (BB0647) governs virulence expression in *Borrelia burgdorferi*. *Mol Microbiol*; 74(6):1331-43.
39. Kumari R R, Kumar P, **Kumar M.** (2009). Nutritional Deficiency Diseases of Newborn Farm Animals and There Management. *Intas Polivet* ; 10 (2).
40. Pal U, Dai J, Li X, Neelakanta G, Luo P, **Kumar M**, Wang P, Yang X, Anderson J F, Fikrig E. (2008). A differential role for BB0365 in the persistence of *Borrelia burgdorferi* in mice and ticks. *J Infect Dis*; 197 (1):148-55.
41. Coleman A S, Yang X, **Kumar M**, Zhang X, Promnares K, Shroder D, Kenedy M R, Anderson J F, Akins D R, Pal U.(2008). *Borrelia burgdorferi* complement regulator-acquiring surface protein 2 does not contribute to complement resistance or host infectivity. *PLoS ONE*; 3 (8):3010e
42. Kumar P, Challa J, Dimri U, **Kumar M.** (2007). Role of Micro-nutrients in dermatological disorders of dog. *Intas Polivet*; 8 (2): 465-471.
43. **Kumar M**, Bhilagaonkar K N, Kumar P. (2006). Epidemiology of Japanese Encephalitis in the Indian Scenario. *Intas Polivet*, 7 (II): 312-319.
44. Kumar P, **Kumar M**, Mudgal V, Mishra S K. (2005). Awareness for nutritional management in Pet animals. *Pet India*; 11 (6): 48-50.

45. Kumar P, **Kumar M**, Prasanna S B, Singh S K. (2004). First Aid assistance for companion animal during emergency. *Pet India*, 10 (12): 15-17.

13. Detail of patents: NA

14. Books/Reports/Chapters/General articles etc.

S.No.	Title	Authors name	Publisher	Year of Publication
1.	Pyometra in canines: an appraisal	Kushwaha R B, Shankar U, Kumar P, Kumar M	<i>Poulvet</i>	2005
2.	PPR control in Goat: A guide for animal health service providers.	Kumar P, Roy R K, Kumar M , Kumari R K, Kumar A.	Vet Helpline India (P) Ltd	2015
3.	Calf Diarrhoea: Devastating disease of bovine during first three months after birth.	Kumar P, Pandian S J, Sinha B S, Kumari R K, Kumar M.	<i>krishisewa</i>	2016
4.	Package and practices for Livestock Farmers: Under supervision of a Veterinarian	Kumar P, Pandian S J, Kumari R K, Kumar M.	<i>Poulvet</i>	2016
5.	Infectious Bovine Rhinotracheitis (IBR): silent problem causing infertility in cross-bred cattle	Kumari R R, Kumar R, Kumari S, Kumar P, Kumar M	Vet Helpline India (P) Ltd	2019
6.	Stem Cell in Veterinary Science	Hussain MS, Kumar M	Springer . Vol., 13:9789811634635	2021

15. Financial support received from various funding agencies:

Title	Role of PI/Co-PI	Funding agency	Funding amount	Duration
Insights to the proteolytic processing and regulation of Clp protease in <i>Leptospira</i> by its ATPase chaperone and adaptor proteins	PI	DBT	Rs.65,95,240	Dec 2021-2024
Role of Trigger factor in caseinolytic protease system of <i>Leptospira</i>	PI	SERB	Rs. 56,24,000	Dec 2020-2023

Repurposing endogenous CRISPR-Cas type_I machinery for efficient markerless genome editing tool in <i>Leptospira interrogans</i>	PI	DBT	Rs. 23,75,000	Aug 2020-Feb 2022
Elucidating the role of Cas6, Cas7, and Cas8 in spirochetes CRISPR adaptive immunity against alien genetic elements	PI	DBT	Rs. 68,75,000	May 2018-Dec 2021
Characterization of predicted novel extracellular proteins of pathogenic <i>Leptospira interrogans</i>	PI	ICMR	Rs. 37,96,000	Aug 2017-2020
Deciphering the role and architecture of CRISPR/Cas defense system in <i>Leptospira interrogans</i>	PI	DBT	Rs. 50,70,000	Oct 2013-April 2017
Purification and characterization of recombinant outer membrane proteins of <i>Leptospira interrogans</i> for vaccine and diagnostics	PI	ICMR	Rs.10,00,000.00	March 2013-2016
Modulation of gene expression in <i>Leptospira interrogans</i> exposed to human catecholamine hormone	PI	SERB	Rs.23,50,000	Aug 2013-2016
Unit of excellence in Molecular and Biochemical Parasitology: Investigation on evolutionary pressure for unique redox metabolism of <i>Leishmania</i> parasite	Co-PI	DBT	Rs.1,05,55,000	Dec 2015-2018

16. No. of Ph.D. students guided or currently enrolled: 07 and 06