Dr. Rajeev Ranjan
(IFBA Certified Professional)

Designation : Scientist cum Biosafety Officer
Qualification : M.V.Sc., Ph.D., DICVP
Discipline : Veterinary Pathology
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Research area: Understanding Foot and Mouth Disease Viral Ecology in India and Landscape Epidemiology toward Control and Eradication.

National/International Awards/Recognitions Received:

- Awarded with the ***Indian Council for Agricultural Research National Eligibility Test*** (ICAR-NET) in 2008 and 2009 for **Veterinary Pathology** under the stream of Life Sciences.
- Awarded with the ***Indian Council for Agricultural Research Senior Research Fellow*** (ICAR-SRF) first position in 2008- 09 for Veterinary Pathology.
- SK Panda, SK Behera, AP Acharya, **Rajeev Ranjan** and PK Rath (2010). "Studies on cattle mortality in different agroclimatic zones of Orissa. National symposium on *Recent Trend in Diagnosis and Pathology of Emerging and Re-emerging Diseases of Livestock and Poultry in* XXVII Annual Conference of IAVP, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati-22, Assam, 25-27 November, 2010. **(Best poster award-2010)**.
- *"Savithree Jibachch Sinha"* awarded to **Ranjan Rajeev**, Biswal J K, Singh K P, Arzt J and Pattnaik B for the ***Best Poster Presentation Award -2015*** on the topic entitled "*Evidence of vertical transmission of foot-and-mouth disease virus from cow to the foetus*" during Veterinary Pathology Congress- 2015 at Department of Veterinary Pathology, NTR College of Veterinary Science, Gannavaram- 521 102, Andhra Pradesh, India, 03- 05 December 2015.
- *"Dr. B.S. Rajya Memorial Award, 2015*" for the **best short/rapid communication** entitled- Isolation and characterization of foot-and-mouth disease virus from a captive Indian elephant (*Elephas maximus*). J.K. Biswal, S. Subramaniam, R. Ranjan, G.K. Sharma and B. Pattnaik. *Indian Journal of Veterinary Pathlogy*, 39 (4): 376-379, 2015.by The Indian Association of Veterinary Pathologists during the Annual conference held at Chhattisgarh Kamdhenu vishwavidhyalaya, Anjora, Durg (CG), 9-11th November, 2016.
- "*ASVP President's Poster Award-2017" to* **Dr. Rajeev Ranjan and Associates** for best poster on the topic entitled "*Foot and Mouth Disease virus ecology in Cattle and Buffalo under natural condition in India*" during International Conference on "*Emerging Horizons in Diagnosis of Animal and Poultry Disease-Towards Sustainable Production in Asia* Countries" under Asian Veterinary Pathology Congress-2017 at Department of Veterinary Pathology, Veterinary College, Hebbal, Bengaluru, Karnataka, India organized by the Asian Society of Veterinary Pathologists, 9-11 November 2017.
- "*IAVP-Best Poster Presentation Award-2017"* to **Drs. Rajeev Ranjan**, J.K. Biswal, S. Subramaniam, K.P. Singh, B. Pattnaik for the Poster entitled "*Foot and Mouth Disease virus ecology in Cattle and Buffalo under natural condition in India*" ICAR-International Centre for Foot and Mouth Disease, Arugul, Bhubaneswar during Asian Veterinary Pathology Conference held at Veterinary College, Hebbal, Bengaluru, Karnataka, India organized by the Asian Society of Veterinary Pathologists, 9-11 November 2017.
- "*Rashtriya Gaurav Award" Certificate of Excellence* presented to **Dr. Rajeev Ranjan** for meritorious services, outstanding performance and remarkable role by Lt. Gen Krishna Mohan Seth (Retd), Former Governor of Chhattisgarh, Madhya Pradesh and Tripura at a seminar on Economic Growth and National Integration organized by India International Friendship Society at New Delhi on 26th March 2018.

- *"Jawaharlal Nehru Award for P.G. Outstanding Doctoral Thesis Research in Agricultural and Allied Science- 2017 for Animal Science"* is presented to **Dr. Rajeev Ranjan,** Scientist, Bio-Safety Officer, ICAR-International Centre for Foot and Mouth Disease (a constituent laboratory of ICAR-Directorate of Foot and Mouth Disease, IVRI Campus, Mukteshwar, Uttarakhand-263138, India), Arugul, Bhubaneswar-752050, Khordha Odisha by Shri Radha Mohan Singh, Union Agriculture and Farmers Welfare Minister on 16th July 2018 at New Delhi.
- **"*IFBA Certified Professional*"-** Professional Certification in Biorisk Management (IFBA Certified Professional, ID Number: NBU344843) provided by "***International Federation of Biosafety Associations (IFBA), 102-2460 Lancaster Road Ottawa, Ontario, Canada, K1B 4S5***" on June 24, 2019.
- **"*IFBA Certified Professional*"-** Professional Certification in Biosafety Cabinets (IFBA Certified Professional, ID Number: NBU344843) provided by "***International Federation of Biosafety Associations (IFBA), 102-2460 Lancaster Road Ottawa, Ontario, Canada, K1B 4S5***" on July 11, 2019.
- **"*ICVP Certified Diplomate*"**- ICVP Board Certification Examination organized by Indian College of Veterinary Pathologist, November 6, 2019.
- **"*IFBA Certified Professional*"-** Professional Certification in Biological Waste Management (IFBA Certified Professional, ID Number: NBU344843) provided by "***International Federation of Biosafety Associations (IFBA), 102-2460 Lancaster Road Ottawa, Ontario, Canada, K1B 4S5***" on October 23, 2019.
- "*IAVMICON-2020-Best Oral Presentation Award-2017"* to **Drs.** J.K. Biswal, S. Subramaniam, **Rajeev Ranjan**, B. Pattnaik for the Oral Presentation on topic entitled "*Genetic basis of the antigenic variation of Foot-and-Mouth Disease virus during virus persistence in naturally infected cattle and buffalo*" during XXXIII Annual Convention of Indian Association of Veterinary Microbiologist Immunologists and Specialists in infectious diseases and National conference on "Challenges and threats of microbes to animals and humans" organized by ICAR-Indian Veterinary Research Institute, Izatnagar-243122, Bareilly, UP during February 6-7, 2020. Pp..104**.**
- Ram Singh Memorial National Animal Welfare Award 2020 cited as **"*National Excellence Award"*** awarded to Dr Rajeev Ranjan, Scientist cum Biosafety Officer, ICAR-Directorate of Foot and Mouth Disease, in recognition of significance contribution for Prevention of Cruelty to Animal and Enhancement of Animal Welfare by Pashudhan Praharee. *RNI No.: JHAHIN/2012/46453. ISSN:2319-6971 (PRINT).*

List of Publications:

Research Articles:

1. J. Lakra, K.D. Prasad, S. Sinha and **R. Ranjan** (2006). Growth performance of growing goat during gastrointestinal nematodiasis and its sustainable control. *J. Res., (BAU).* **18**(1): 193- 196.
2. Das M, Prasad K.D., Sinha S. and **Ranjan R.** (2006). Gastrointestinal helminths infecting goat. *J. Res., (BAU).* **18**(2): 289- 293.
3. J. Lakra, K.D. Prasad, S. Sinha and **R.Ranjan** (2007). Gastrointestinal Namatodiasis and Haematobiochemical alteration in Goat. *Indian Veterinary Journal.* **84** (2): 191- 193.
4. P. Kumari, M.K. Gupta, **R. Ranjan**, K.K. Singh & R. Yadava (2007). *Curcuma longa* as feed additive in broiler birds and its pathophysiological effect. *Indian Journal of Experimental Biology*. **45** (3): 272- 277.
5. **R. Rajeev**, M.K. Gupta, K.K. Singh and D. Jha (2008). Comparative efficacy of Papanicolaou stain and Leishman stain in exfoliative cytology in bovine mastitis. *Indian J. Vet Pathol., 32**(2):***

277- 279.

6. Kumar, S., **Ranjan, R**., Singh, K.K. and Gupta, M.K. (2009). *In vivo* chemotactic evaluation of ferrous ion in piglets. *Indian J. Vet. Pathol.*, 33(2): 160- 162.
7. Kumari, P., Gupta, M.K., **Ranjan, R.**, Singh, K.K., Yadava, R. and Singh, S. (2009). Pathophysiological effects of *Centella asiatica* and combination with *Curcuma longa* as feed additive in broiler birds. *Indian J. Vet Pathol.*, 33(2): 186- 189.
8. Ajay Pratap Singh, Satparkash Singh**, Rajeev Ranjan**' S.K. Gupta, V.P.Singh, Bhaskar Sharma (2010). Molecular heterogeneity of *plp*E gene in Indian isolates of *Pasteurella multocida* and expression of recombinant PlpE protein in vaccine strain of *P. multocida* serotype B: 2. *Journal of Veterinary Science*, **11**(3): 227- 233.
9. Sanjeev Kumar and **R. Ranjan** (2010). Role of ferrous iron in chemotaxis. *Indian Veterinary Journal*. **87**(9): 859- 861.
10. **Rajeev Ranjan**, M. K. Gupta, Satparkash Singh and Sanjeev Kumar (2010). Current trend of drug sensitivity in bovine mastitis. *Veterinary World,* **3**(1): 17- 20.
11. **Rajeev Ranjan,** Satparkash Singh, V.P. Singh, S. K. Gupta, Ajay Pratap Singh, Bhaskar Sharma. (2010). Detection of *Pasteurella multocida* in Blood by Real-Time PCR. *Indian J. Vet Pathol.*, 34(1):15- 16.
12. **R. Ranjan,** M. K. Gupta and K. K. Singh (2010). Diagnosis and treatment of bovine mastitis- A holistic approach. *Indian J. Vet. Res.*, 19(2): 37-44.
13. **Rajeev Ranjan,** M. K. Gupta and K.K. Singh (2011). Study of bovine mastitis in different climatic conditions in Jharkhand, India. *Veterinary World*, **4**(5): 205-208.
14. Satparkash Singh, Vijendra Pal Singh, Pawanjit Singh Cheema, Maninder Sandey, **Rajeev Ranjan**, Santosh Kumar Gupta and Bhaskar Sharma (2011). Immune response to DNA vaccine expressing transferrin binding protein a gene of *Pasteurella multocida. Brazilian Journal of Microbiology*, **42**: 750-760.
15. Ramesh Kumar Nirala, C. Jayachandran, **Rajeev Ranjan** and Ram Karishna Bauri (2011). Pharmacokinetic of Sparfloxacin and its effect on immune system in goats. *Asian J. Pharm. Biol Res*, 1(3): 343- 349.
16. Panda, S.K., Sahu, Banamali, **Ranjan, Rajeev**, Acharya, A.P. and Rath, S.K. (2011). Prevalence and clinicopathological study of theileriosis in bovine in coastal areas of Orissa. *Indian J. Vet. Pathol*., 35(2) : 128-132.
17. Bauri RK, **Ranjan R**, Deb AR and Ranjan R (2012): Prevalence and sustainable control of *Balantidium coli* infection in pigs of Ranchi, Jahrkahnd, India, *Vet. World* 5 (2): 94-99, doi: 10.5455/vetworld.2012.94-99.
18. R.K. Bauri, **Rajeev Ranjan**, A.R. Deb and Rakesh Ranjan (2012). Prevalence of zoonotic gastrointestinal protozoa in zoo animals. *Indian Veterinary Journal*. **89** (3): 71.
19. Rakesh Ranjan, Ajit Kumar Sinha and **Rajeev Ranjan** (2012). Effect of feeding mustard cake as a replacement of ground nut cake on different parameters of blood constituents. *Indian Veterinary Journal.* **89** (7): 127- 128.
20. R.K. Bauri, **Rajeev Ranjan**, A.R. Deb and Rakesh Ranjan (2012). Prevalence of zoonotic gastrointestinal protozoa in domestic animals. *Indian Veterinary Journal*. **89** (10): 16.
21. Behera S.K., Panda S.K., Patro D., Acharya A.P., Rath P.K. and **Rajeev Ranjan** (2013). Studies on cattle mortality in different agroclimatic zones of Odisha. *Indian Veterinary Journal*. **90** (2):

17- 19.

22. Saravanan Subramaniam, Aniket Sanyal, Jajati K. Mohapatra, Gaurav K. Sharma, Jitendra K. Biswal, **Rajeev Ranjan**, Manoranjan Rout, Biswajit Das, Punam Bisht, Basavaraj S. Mathapati, Bana B. Dash, Bramhadev Pattnaik (2013). Emergence of a novel lineage genetically divergent from the predominantInd 2001 lineage of serotype O foot-and-mouth disease virus in India. *Infection, Genetics and Evolution*. 2013 18: 1-7.

23. Sinha SK, Sinha AK, Mahto DK and **Ranjan R** (2013) Study on the growth performance of the broiler after feeding of okara meal containing with or without non-starch polysaccharides degrading enzyme, *Vet. World* 6(6):325- 328, doi:10.5455/vetworld.2013.325-328.

24. Yashpal Singh Malik, Kuldeep Sharma, Naveen Kumar, Sathish B. Shivachandra, Vinita Rawat, Ritu Rakholia, **Rajeev Ranjan**, Balasubramanian Ganesh, ManMohan Parida (2013). Rapid detection of human rotavirus using NSP4 gene specific reverse transcription loop-mediated isothermal amplification assay. *Virus Disease*. 24 (2): 265-271.

25. Punam Bisht, Jajati K. Mohapatra, Saravanan Subramaniam, Biswajit Das, Veena Pande,Jitendra K. Biswal, Gaurav K. Sharma, Manoranjan Rout, **Rajeev Ranjan**, Bana B. Dash,Aniket Sanyal, Bramhadev Pattnaik(2014). Efficient rescue of foot-and-mouth disease virus in cultured cellstransfected with RNA extracted from clinical samples. *Journal of Virological Methods* 196: 65– 70.

26. **Rajeev Ranjan,** Muniswamy Kangayan, Saravanan Subramaniam, Jajati K. Mohapatra, Jitendra K. Biswal, Gaurav K. Sharma, Aniket Sanyal, Bramhadev Pattnaik (2014). Development and Evaluation of a one step Reverse Transcription-Loop Mediated Isothermal Amplification Assay (RT-LAMP) for rapid detection of foot and mouth disease virus in India. *Virus Disease*, 25(3): 358- 364. DOI 10.1007/s13337-014-0211-2.

27. Sinha S.K., Sinha A. K. and **Ranjan Rajeev**. (2014). Feeding of okara meal with or without non-starch polysaccharides degrading enzymes: Effect on growth performance, carcass quality and organoleptic tests of broiler chickens. *Indian Journal of Poultry Science*, 49(1): 43-47.

28. G.K. Sharma, S. Mahajan, B. Das, **R. Ranjan**, A. Kanani, A. Sanyal and B. Pattnaik (2014). Comparison of stabilisers for development of a lyophilised multiplex reversetranscription PCR mixture for rapid detection of foot and mouth disease virus serotypes. *Rev. sci. tech. Off. int. Epiz.*, 33 (3). 859- 867.

29. Jitendra K Biswal; Punam Bisht; Jajati K Mohapatra; **Rajeev Ranjan**; Aniket Sanyal; Bramhadev Pattnaik (2015). "Application of recombinant capsid polyprotein (P1) expressed in prokaryotic system to detect antibodies against foot-and-mouth disease virus serotype O*"*. *Journal of Virological Methods.* 215–216 (2015) 45–51.

30. Saravanan S, Mohapatra J K, Sharma G K, Biswal J K, **Ranjan R**, Rout M, Das B, Dash B B, Sanyal A, Pattnaik B (2015). Evolutionary dynamics of foot-and-mouth disease virus O/ME-SA/Ind2001 lineage. *Vet. Microbiol.* 178(3-4):181-9. http://dx.doi.org/10.1016/j.vetmic.2015.05.015.

31. Sharma GK, Mahajan S, Matura R, Subramaniam S, **Ranjan R**, Biswal J, Rout M, Mohapatra JK, Dash BB, Sanyal A, Pattnaik B. Diagnostic assays developed for the control of foot-and-mouth disease in India. *World J Virol* 2015; 4(3): 295-302. DOI: 10.5501/wjv.v4.i3.295.

32. Biswal JK, Bisht P, Subramaniam S, **Ranjan R**, Sharma GK, Pattnaik B. 2015. Engineering foot-and-mouth disease virus serotype O IND R2/1975 for one-step purification by immobilized metal affinity chromatography. *Biologicals.* 43(5):390-8. http://dx.doi.org/10.1016/j.biologicals.2015.06.001.

33. Biswal JK, Subramaniam S, **Ranjan R**, Sharma GK, Misri J, Pattnaik B.(2015) Marker vaccine potential of foot-and-mouth disease virus with large deletion in the non-structural proteins 3A and 3B, *Biologicals*. pii: S1045-1056(15)00084-6. doi: 10.1016/j.biologicals.2015.07.004.

34. Biswal JK, Subramaniam S, Sharma GK, Mahajan S, **Ranjan R**, Misri J, Pattnaik B.(2015) Megaprimer-mediated capsid swapping for the construction of custom-engineered chimeric foot-and-mouth disease virus. *Virus Genes*. 51(2): 225-33. doi: 10.1007/s11262-015-1237-2.

35. Kumar N, Singh R, Kurade NP, Saminathan M, **Ranjan R** and Kumar Pawan (2015). Immunohistochemical evaluation of chemopreventive effect of hydro-alcoholic extract of garlic (*Alium sativum*) in N-mehtyl-nitrosourea (NMU) induced rat mammary tumours. *Indian J.Vet. Pathol., 39(3): 201- 216, 2015: DOI: 10.5958/0973-970X.2015.00051.6.*

36. Biswal J.K., Subramaniam S., **Ranjan R**., Sharma G.K. and Pattnaik B. (2015). Isolation and characterisation of foot-and-mouth disease virus from a captive Indian elephant (*Elephas maximus*). *Indian J. Vet. Pathol*., 39(4) : 376-379, 2015: DOI: 10.5958/0973-970X.2015.00094.

37. Sharma GK, Mahajan S, Matura R, Biswal JK, **Ranjan R**, Subramaniam S, Misri J, Bambal RG, Pattnaik B. 2016. Herd Immunity Against Foot-and-Mouth Disease Under Different Vaccination Practices in India. *Transbound Emerg Dis*. 2016 Feb 26. doi: 10.1111/tbed.12478.

38. **Ranjan R**, Biswal JK, Sharma AK, Kumar M, Pattnaik B. (2016). Managements of Foot and Mouth Disease in a dairy farm: By Ethnoveterinary practice. *Indian J Anim Sci*. 86 (3): 256–259.

39. Biswal J.K., **Ranjan R**., and Pattnaik B. (2016). Diagnostic application of recombinant non-structural protein 3A to detect antibodies induced by foot-and-mouth disease virus infection. *Biologicals*.DOI: 10.1016/j.biologicals.2016.02.004.

40. **Ranjan R**, Biswal JK, Sharma AK, Misri J, Pattnaik B. (2016). Profiling of bovine Toll Like Receptors (TLRs) in Foot and Mouth Disease (FMD) vaccinated cattle. *Indian J Anim Sci*. **86** (4): 367–371.

41. Biswal JK, **Ranjan R**, Pattnaik B (2016). Chimeric foot-and-mouth disease virus serotype O displaying a serotype Asia1 antigenic epitope at the surface. *Biotechnol Lett*. 36 (6): DOI 10.1007/s10529-016-2121-4

42. Biswal JK, Subramaniam S, **Ranjan R**, Pattnaik B (2016). Partial deletion of stem-loop 2 in the 3' untranslated region of foot-and-mouth disease virus identifies a region that is dispensable for virus replication. *Arch. Virol*. 161 (8): 2285-2290.

43. Biswal JK, Subramaniam S, **Ranjan R**, Pattnaik B (2016). Evaluation of FTA(®) card for the rescue of infectious foot-and-mouth disease virus by chemical transfection of extracted RNA in cultured cells. *Mol Cell Probes*. 30(4): 225-30. doi: 10.1016/j.mcp.2016.06.002.

44. **Ranjan R**, Biswal JK, Sharma GK, Sharma AK, Singh KP, Misri J and Pattnaik B. (2016). Use of nucleic acid recognition methods (m-PCR and RT-LAMP) for the detection of foot-and-mouth disease virus excreted in cow milk. *Indian J Anim Sci*. **86** (8): 865–868.

45. **Ranjan R**, Biswal JK, Subramaniam S, Singh KP, Stenfeldt C, Rodriguez LL, Pattnaik B, Arzt J. (2016). Foot-and-Mouth Disease Virus-Associated Abortion and Vertical Transmission following Acute Infection in Cattle under Natural Conditions. PLoS ONE 11(12): e0167163. doi:10.1371/journal. pone.0167163.

46. **Ranjan, R**., Biswal, J.K., Singh, K.P. and Pattnaik, B. (2016). Optimization of fluorescent antibody techniques for demonstration of foot-and mouth disease virus in bovine tongue epithelium and dorsal soft palate. Indian J. Vet. Pathol., 40(4) : 297-304.

47. Hayer S S[#], **Ranjan R[#],** Biswal J K, Saravanan S, Mohapatra J K, Sharma G K, Rout M, Dash B

B, Das B, Prusty B R, Sharma A K, Stenfeldt C, Perez A , Rodriguez L L, Pattnaik B, Waal K V, Arzt J. **2017**. Quantitative characteristics of the foot-and-mouth disease carrier state under natural conditions in India. *Transbound Emerg Dis.* 2017 Mar 2. DOI: 10.1111/tbed.12627.

48. Mahto D.K., Sinha A.K., Sinha S.K., Shivani S., **Ranjan R**. 2017. Influence of Inclusion of Different Levels of Okara Meal in Replacement of Groundnut Cake in the Diet on Nutrient Utilization and Growth Performance in Japanese Quails. *Indian J. Anim. Nutr.* 2017. 34 (1): 99-103doi: 10.5958/2231-6744.2017.00016.0.
49. Biswal, J.K., **Ranjan, R**., Das, B., Subramaniam, S., Pattnaik, B. (2017). The direct boil RT-mPCR: A simple and rapid method for detection of foot-and-mouth disease virus genome in clinical samples without nucleic acid extraction. *Indian J. Vet. Pathol*., 41(1) : 12-17.
50. Subramaniam, S., Das, B., Biswal, J.K., **Ranjan, R**., Pattnaik, B. (2017). Antigenic variability of foot-and-mouth disease virus serotype O during serial cytolytic passage. *Virus Gene*. DOI 10.1007/s11262-017-1494-3.
51. Biswal JK, Subramaniam S, **Ranjan R**, Pattnaik B (2017). Uncleaved 2A-peptide of foot-and-mouth disease virus can display foreign epitope-tag at the virion surface. *Infection, Genetics and Evolution* 54 (2017) 324–329.
52. Hayer SS, VanderWaal K, **Ranjan R**, Biswal J K, Saravanan S, Mohapatra J K, Sharma G K, Rout M, Dash B B, Das B, Prusty B R, Sharma A K, Stenfeldt C, Perez A, Delgado AH, Sharma MK, Rodriguez L L, Pattnaik B, Arzt J. **2017**. Foot-and-mouth disease virus transmission dynamics and persistence in a herd of vaccinated dairy cattle in India. *Transbound Emerg Dis*. 2017;00:1–12. https://doi.org/10.1111/tbed.12774.
53. **Rajeev Ranjan**, Jitendra K Biswal, Saravanan Subramanium, Bana B Dash, Karam P Singh Jonathan Arzt, Luis L Rodriguez and Bramhadev Pattnaik. (2018). Evidence of subclinical foot-and-mouth disease (FMD) virus infection in young calves born from FMD clinically recovered cow under natural condition. DOI: *Trop. Anim. Health. Prod.* https://doi.org/10.1007/s11250-018-1518-6.
54. Sharma AK, Bhatt M, Sankara M, Mohapatra JK, Dash BB, Gowane GR, Subramaniam S, **Ranjan R**, Pattnaik B. (2018). Kinetics of Interferon gamma and Interleukin-21 response following foot and mouth disease virus infection. *Microbial Pathogenesis*. 125: 20–25.
55. Subramaniam, S., Gahtori, R., Biswal, J.K., **Ranjan, R**. and Pattnaik, B. (2018). Development and evaluation of Reverse Transcription-Polymerase Chain Reaction (RT-PCR) assay for differentiation of Foot and Mouth Disease virus serotype O lineages circulating in India. *Indian J. Vet. Pathol*., 42(4): 287-291.
56. Biswal JK, **Ranjan R**, Subramaniam S, Mohapatra JK, Patidar S, Sharma MK, et al. (2019). Genetic and antigenic variation of foot-and-mouth disease virus during persistent infection in naturally infected cattle and Asian buffalo in India. *PLoS ONE* 14(6): e0214832. https://doi.org/10.1371/journal. pone.0214832.(Equally contributed).
57. Bertram MR, Palinski RM, **Ranjan R**, Biswal JK, Pauszek SJ, Hartwig EJ, Smoliga GR, Fish IH, Vierra D, Subramaniam S, Mohapatra JK, Das B, Pattnaik B, Arzt J. 2019. Genome sequences of 18 foot-and-mouth disease virus outbreak strains of serotype O sublineage Ind2001d from India, 2013 to 2014. *Microbiol Resour Announc* 8:e00776-19. https://doi.org/10.1128/MRA.00776-19.
58. Biswal JK, Subramaniam S, **Ranjan R**, VanderWaal K, Sanyal A, Pattnaik B, Singh RK. 2019. Differential antibody responses to the major antigenic sites of FMD virus serotype O after primo-vaccination, multiply-vaccination and after natural exposure. *Infect Genet Evol.*,

https://doi.org/10.1016/j.meegid.2019.104105.

59. Bertram MR, Palinski RM, Pauszek SJ, Hartwig EJ, Smoliga GR, Biswal JK, **Ranjan R**, Subramaniam S, Mohapatra JK, Das B, Fish IH, Pattnaik B, Luis L Rodriguez, Arzt J. 2020. Genome Sequences of seven Foot-and-Mouth Disease virus isolates reveal diversity in O/ME-SA/Ind2001 Lineage in India between 1997 and 2009. *Microbiology Resource Announcements*, Apr 2020, 9 (16), e00287-20; **DOI**:10.1128/MRA.00287-20

Articles/lead paper published in NATIONAL/ INTERNATIONAL souvenir:

1. Sanyal, S. Subramaniam, J. K. Biswal, J. K. Mohapatra, **R. Ranjan.** B. B. Dash, J. Misri, K.M.L. Pathak and B. Pattnaik. (2012). Current scenario of Foot and Mouth Disease in India. FAO-ICAR International Conference on "Scientific developments and technical challenges in the progressive control of Foot and Mouth Disease in South Asia" at New Delhi, India, 13-15 February 2012, pp 16- 20.
2. G.K. Sharma, J.K. Mohapatra, S. Mahajan, **R. Ranjan,** M Rout, B. Pattnaik. (2012). Significance of differentiation of infected from vaccinated animals in India. FAO-ICAR International Conference on "Scientific developments and technical challenges in the progressive control of Foot and Mouth Disease in South Asia" at New Delhi, India, 13- 15 February 2012, pp 26- 29.
3. J. K. Biswal, G.K. Sharma, **R. Ranjan,** A. Sanyal, J Misri, G Prasad and B. Pattnaik (2012). Necessity of landscape genetics for control and eradication of FMD in India. FAO-ICAR International Conference on "Scientific developments and technical challenges in the progressive control of Foot and Mouth Disease in South Asia" at New Delhi, India, 13- 15 February 2012, pp 30- 31.
4. B. Pattnaik, M. Rout, **R. Ranjan**, J.K. Mohapatra, B.B. Dash and A. Sanyal (2013). Status of Foot and Mouth Disease in South Asia. Veterinary Pathology Congress- 2013. National symposium on "advances and applications of diagnostic pathology for disease management in livestock, poultry, pet, fish, laboratory animal and wildlife" at Orissa University of agriculture and technology, Bhubaneswar, Odisha, India, 21- 23 November 2013, pp 53- 58.
5. **Rajeev Ranjan,** Jitendra K Biswal, Bana B Dash and B Pattnaik (2016). Conventional and new approach for diagnosis of foot and mouth disease virus. 33rd Annual Conference of Indian Association of Veterinary Pathologists & 7th Annual Meeting of Indian College of Veterinary Pathologists and National symposium on "Innovative Approaches for Diagnosis and Control of Emerging and Re-emerging Diseases of Livestock, Poultry and Fish" at Department of Veterinary Pathology, college of Veterinary Science & AH, Chhattisgarh Kamdhenu Vishwavidyalaya, Anjora, Durg-491001, Chhattisgarh, India, November 9-11, 2016. Pp-109-113.
6. **Rajeev Ranjan**, Jitendra K Biswal, Saravanan Subramaniam, B Pattnaik (2017). Persistence of foot-and-mouth disease virus in cattle and buffalo. National Seminar on "Opportunities and Challenges of Transnational Research in the Frontier Areas of Animal Biotechnology", from 22- 23 September 2017 at C.V.Sc. & A.H., OUAT, Bhubaneswar, Odisha. Pp.- 62-65.
7. Jitendra K Biswal, **Rajeev Ranjan**, Saravanan Subramaniam, Bramhadev Pattnaik (2017). Reverse genetics approaches for the development of next generation vaccines again foot-and-mouth disease. National Seminar on "Opportunities and Challenges of Transnational Research in the Frontier Areas of Animal Biotechnology", from 22- 23 September 2017 at CVSc & AH, OUAT, Bhubaneswar, Odisha. Pp.- 65.
8. **Rajeev Ranjan**, Jitendra K Biswal, Saravanan Subramaniam, B Pattnaik (2018). Foot-and-

Mouth Disease Virus: Subclinical infection in cattle and buffalo. National Symposium on "Recent Advances in Veterinary Pathology and Disease Diagnosis for Sustainable Livestock and Poultry Production" at Department of Veterinary Pathology, College of Veterinary Science and Animal Husbandry, Sardarkrushinagar Dantiwada AU, Sardarkrushinagar- 385 506, District: Banaskantha, Gujarat, India from October 22-24, 2018. Pp.- 171-173.

9. **Rajeev Ranjan**, Jitendra Kumar Biswal, Saravanan Subramaniam and Rajkumar Singh (2020). Diagnostic Paradigms in Strategizing Foot-and-Mouth Disease Control and Eradication. Zonal Conference IAVP ZONAL CONFERENCE-2020 And NATIONAL SYMPOSIUM On "Recent advances in diagnostic pathology for emerging and re-emerging diseases in livestock, poultry under farming conditions and wildlife" Organized by IAVP Jharkhand Chapter; Department of Veterinary Pathology, RVC, BAU, Kanke, Ranchi 6, IAVP Central Zone and East Zone; NAHEP-CAST Programme, BAU, from Feb 22-24, 2020. Pp.-

Popular articles/ leaflet/ folder published:

1. **Rajeev Ranjan**, Satparkash Singh and Ajay Pratap Singh (2009). Thnaila Rog. *Pashupalan*, First Issue: 12- 14.
2. Saravanan Subramaniam, **Rajeev Ranjan**, Aniket Sanyal, Bramhadev Pattnaik (2012). Diagnosis of Foot and Mouth Disease. *Indian Farming*, 61 (11): 9- 12.
3. **Rajeev Ranjan** (2013). Khurpaka evam muhpaka rog ke niyantran mein Pashupalak ki mahatav bhumika. In Hindi.- folder.
4. **Rajeev Ranjan** (2013). Khurpaka evam muhpaka rog ke niyantran mein Pashupalak ki mahatav bhumika. In Marathi.- folder.
5. **Rajeev Ranjan** (2013). Khurpaka evam muhpaka rog ke niyantran mein Pashupalak ki mahatav bhumika. In Hindi.-leaflet.
6. J.K. Mohapatra, Rajeev Ranjan, M. Rout and B. Pattnaik (2014). Foot-and-Mouth Disease: Epidemiology and control. *Indian Farming*, Dec (2014).44-46.
7. **Rajeev Ranjan,** Jitendra Kumar Biswal and B. Pattnaik (2015). Khurpaka - muhpaka rog: prabandhan evam niyantran. *Kheti*, September (2015): 38- 40.
8. **Rajeev Ranjan** (2013). Farmers play an important role in control of foot and mouth disease. In English. - folder.
9. **Rajeev Ranjan** (2013). Farmers play an important role in control of foot and mouth disease. In English. - leaflet.
10. **Rajeev Ranjan, Jitendra Kumar Biswal and Madhurendu Kumar Gupta**. Examination of milk: A new approach of handling Bovine Mastitis. Pashudhan Prahare. September 26, 2020. https://www.pashudhanpraharee.com/examination-of-milk-a-new-approach-of-handling-bovine-mastitis/#comment-4604.

Review articles:

1. **Rajeev Ranjan**, S.K. Panda, A.P. Acharya, A.P. Singh and M.K. Gupta (2010). Molecular diagnosis of Hamorrhagic Septicaemia- A Review. *Veterinary World*, 4(4): 189- 192.
2. Jitendra K. Biswal, Aniket Sanyal, Luis L.Rodriguez, Saravanan Subramaniam, Jonathan Arzt, Gaurav K. Sharma, Jef M. Hammond, Satya Parida, Jajati K. Mohapatra, Basavaraj S. Mathapati, Bana B. Dash, **Rajeev Ranjan**, Manoranjan Rout, Ramamurthy

Venketaramanan, Lal Krishna, Gaya Prasad, Krishna M.L. Pathak and Bramhadev Pattnaik (2012). Foot-and-mouth Disease: Global Status and Indian Perspective. *Indian* Journal of Animal Science. 82 (2): 109–131.

3. Bramhadev Pattnaik, Saravanan Subramaniam, Aniket Sanyal, Jajati K. Mohapatra, Bana B. Dash, **Rajeev Ranjan** and Manoranjan Rout (2012). Foot-and-Mouth Disease: Global status and future Road Map for control and prevention in India. *Agricultural Research*. DOI 10.1007/s40003-012-0012-z. (2), 132-147.
4. Sharma GK, Mahajan S, Matura R, Subramaniam S, **Ranjan R**, Biswal J, Rout M, Mohapatra JK, Dash BB, Sanyal A, Pattnaik B. Diagnostic assays developed for the control of foot-and-mouth disease in India. *World J Virol* 2015; 4(3): 295-302. DOI: 10.5501/wjv.v4.i3.295.
5. **Ranjan, R**., Biswal, J.K., Sharma, G.K. and Pattnaik, B. (2016). A Review on Foot-and-mouth disease: pathology, diagnosis and its management. *Indian J. Vet. Pathol*., 40(2): 105-115.

Manuals:

1. Dr. Sanjay Kumar Goyal, **Dr. Rajeev Ranjan** (2006-07). Laboratory Manual of General veterinary Pathology VPP-211.
2. **Dr. Rajeev Ranjan**, Dr. Sanjay Kumar Goyal (2006-07). Laboratory Manual of Systemic Pathology VPP-221.
3. **Dr. Rajeev Ranjan**, Dr. Sanjay Kumar Goyal, Dr. Nem Singh (2007-08). Laboratory Manual of Special Pathology- I, VPP-311.
4. **Dr. Rajeev Ranjan** and Dr. Nem Singh (Ex-Joint Director IVRI) (2007-08). Laboratory Manual of Special Pathology- II (Poultry disease), VPP-321.

Book Chapters:

1. **R. Ranjan**, Saravanan S, G.K. Sharma, J.K. Mohapatra, J.K. Biswal, M. Rout, B.B. Dash, A. Sanyal and B. Pattnaik (2012). Recent advances in diagnosis of Foot and Mouth Disease: In Advances in Diagnosis of Livestock and Poultry Diseases. Division of Virology, Indian Veterinary Research Institute. Pp- 15- 24.
2. S.B. Sudhakar, K.K. Rajak, **R. Ranjan**. Amit Kumar, D. Muthuchelvan and K. Dhama (2012). Recent advances in diagnosis of Chicken Infectious Anaemia: In Advances in Diagnosis of Livestock and Poultry Diseases. Division of Virology, Indian Veterinary Research Institute. Pp- 98- 107.
3. M. Rout, J.K. Mohapatra, S. Saravanan, K. Muniswamy, B.B. Dash, A. Sanyal, **R. Ranjan**, G.K. Sharma, J.K. Biswal & B. Pattnaik (2013). Foot and mouth disease: In Trends in Diagnosis of Animal Viral Diseases. Published by: Agri-Biovet Press. Pp63-80.
4. Gaurav Kumar Sharma, **Rajeev Ranjan**, Jajati Keshri Mohapatra, Jitendra Kumar Biswal and Bramhadev pattnaik (2013). Khurpaka- Muhpaka Rog: Roktham evam Niyantran: In Parvatiya Kshetro men AAdhunik Go Palan. Published by: Division of Virology, Indian Veterinary Research Institute. Pp- 109- 112.
5. G K Sharma, J K Biswal, S Mahajan and **R Ranjan** (2013). Role of bull semen in epidemiology of Foot and Mouth Disease. In: Pathak, K.M.L., Pattnaik, B., Rout, M., Bhasin, V., Sumption, K., Prasad, G, Misri, J. (Eds). Topics in Foot and mouth disease. Indian council of Agricultural Research. pp. 148-154.

6. M. Rout, R. Ranjan, B.B. Dash and J. Misri (2013). Methods in Diagnosis of Foot and Mouth Disease. In: Pathak, K.M.L., Pattnaik, B., Rout, M., Bhasin, V., Sumption, K., Prasad, G, Misri, J. (Eds). Topics in Foot and mouth disease. Indian council of Agricultural Research. pp. 292-330.
7. **Rajeev Ranjan,** Jitendra Kumar Biswal and B. Pattnaik (2016). Persistence of foot-and-mouth disease virus in Advances in Animal Sciences and Biomedicine in 21st Century. International Academy of Biosciences (IAB), pp: 167-172.

Success stories:

1. **Rajeev Ranjan** (2015). Development of indigenous method for treatment of FMD affected cows. PDFMD, Vision-2050.
2. **Rajeev Ranjan** (2015). Rescue of FMD virus by transfection to Improve the rate of diagnosis. DARE/ICAR ANNUAL REPORT 2014-15. Pp 77.
3. **Rajeev Ranjan** (2016). Understanding FMD viral ecology and landscape epidemiology towards control and eradication. DARE/ICAR ANNUAL REPORT 2015–16.pp. 65.
4. Biswal J.K., **Ranjan R**., and Pattnaik B. (2017). 3A based DIVA ELISA to detect Antibodies induced by FMDV. DARE/ICAR ANNUAL REPORT 2016-17. pp. 80

Editor of Books/Annual Report/Vision/Manual/conference proceedings etc.

1. K.M.L. Pathak, C.S. Prasad, Gaya Prasad, S.C. Gupta, B.S. Prakash, A. Sanyal, J.K. Biswal, Rajeev Ranjan, Vineet Bhasin, Rajan Gupta, Jyoti Misri and Neelam Gupta (2012). Livestock technology way to diversified agriculture. Directorate of Knowledge Management in Agriculture (DKMA), Indian Council of Agricultural Research.
2. Annual Report of PDFMD 2010- 11. In English
3. Annual Report of PDFMD 2011- 12. In English
4. Annual Report of PDFMD 2011- 12. In Hindi
5. Annual Report of PDFMD 2013- 14. In English
6. Annual Report of PDFMD 2014- 15. In English
7. Annual Report of PDFMD 2014- 15. In Hindi
8. Annual Report of DFMD 2015-16. In English
9. Annual Report of DFMD 2015-16. In Hindi.
10. Annual Report of DFMD 2016-17. In English.
11. Annual Report of DFMD 2017-18. In English.
12. Annual Report of DFMD 2018-19. In English.
13. Vision PDFMD 2030

National/International conferences/seminars/symposiums/training /workshop attended:

- Attended more than 60 national and international conferences/seminars/ symposium/ training/ workshops.

Training Organized/provided:

1. Continue Veterinary Education on Postmortem Examination and Veterolegal cases, at Department of Veterinary Pathology, Orissa Veterinary College, OUAT, Bhubaneswar-751003.
2. Conducted 3 days training program on (a.) Diagnosis of foot and mouth disease virus by

typing ELISA and (b.) Diagnosis of non-structural protein against foot and mouth disease virus by diva ELISA between 19-21 December, 2016, at ICAR- Directorate of foot and mouth disease, ukteshwar-263138, Nainital, Uttarakhand, for AICRP on FMD Rishikesh, Uttarakhand.

3. Organized "Online FMD investigation training course for India (FITC1), with the help of European commission for the control of foot-and-mouth disease, Food and Agriculture Organization of the United Nations and the Directorate for foot-and-mouth disease, Indian council for agricultural research during 10th January 2019 to 14th February 2019.

Resource Person:

1. Workshop on "***foot and mouth disease in dairy animals***" at national dairy research institute, Karnal (HR)- 132001, 15- 16 December 2011 as foot and mouth disease expert.
2. "*Foot and mouth disease: Management and control with special emphasis on biosecurity measures*" – on 12.12.2013 at Patna, during interactive session on FMD outbreak and its future control.
3. Foot and Mouth Disease: prevention and control- on **28th November 2013** and **25th February 2014** at IVRI campus Mukteshwar.
4. **Delivered a talk on "**Conventional and new approach for diagnosis of foot and mouth disease virus" during 33rd Annual Conference of Indian Association of Veterinary Pathologists & 7th Annual Meeting of Indian College of Veterinary Pathologists and National symposium on "Innovative Approaches for Diagnosis and Control of Emerging and Re-emerging Diseases of Livestock, Poultry and Fish" at Department of Veterinary Pathology, college of Veterinary Science & AH, Chhattisgarh Kamdhenu Vishwavidyalaya, Anjora, Durg-491001, Chhattisgarh, India, November 9-11, 2016. Pp-109-113.
5. **Delivered a talk on "**Persistence of foot-and-mouth disease virus in cattle and buffalo" during National Seminar on "Opportunities and Challenges of Transnational Research in the Frontier Areas of Animal Biotechnology", from 22- 23 September 2017 at C.V.Sc. & A.H., OUAT, Bhubaneswar, Odisha. Pp.- 62-65.
6. As expert, for workshop on **"Brain Storming Workshop on Foot and Mouth Disease**", in order to crystallize scientific and developmental possibilities at ICAR-Central Institute for Research on Buffaloes, Hisar 125 001, Haryana, INDIA during September 14-15, 2018.
7. **Delivered a talk on "**Foot-and-Mouth Disease Virus: Subclinical infection in cattle and buffalo" during National Symposium on "Recent Advances in Veterinary Pathology and Disease Diagnosis for Sustainable Livestock and Poultry Production" at Department of Veterinary Pathology, College of Veterinary Science and Animal Husbandry, Sardarkrushinagar Dantiwada AU, Sardarkrushinagar- 385 506, District: Banaskantha, Gujarat, India from October 22-24, 2018. Pp.- 171-173.
8. Invited lecture on "Combating FMD: A nemesis of dairy animal" during **47th Dairy Industry Conference 2019** on "Innovative Approaches for Enhancing Dairy Farmers income" organized by Indian Dairy Association, New Delhi in Collaboration with IDA (EZ), Kolkata & IDA, Bihar State Chapter, held at Samrat Ashoka International Convention Kendra, Gandhi Maidan, Patna during 7-9th February 2019.
9. Deliver an e-lecture under NAHEP_IG Project on August 07, 2020 at 3.30 PM by Zoom Cloud Platform on the topic entitled ***"Subclinical Infection of Foot and Mouth Disease in Cattle and Buffalo"*** organized by Director Research, Office of the Director Research, Bihar Animal Sciences University, BVC campus, Patna-800014, Bihar. Invitation No.: 05/NAHEP/BASU/2020/1437 dated 27.07.2020.

Position/ Offices held in various positions:

1. Act as reviewers for more than 30 national and international peered reviewed journals.
2. Act as a **Rapporteur** for presenting a paper in the National Symposium on "Challenges and Advances in Disease Diagnosis of Livestock, Poultry and Fish: Redefining the role of Veterinary Pathologists" organized by Indian Association of Veterinary Pathologists and Indian College of Veterinary Pathologists at Department of Veterinary Pathology, NTR College of Veterinary Science, Gannavaram- 521 102, Andhra Pradesh, India, 03- 05 December 2015.
3. Act as a **Rapporteur** for "Technical Session-X: Wildlife Pathology and Aquatic Pathology" during International Conference on "*Emerging Horizons in Diagnosis of Animal and Poultry Disease-Towards Sustainable Production in Asia* Countries" under Asian Veterinary Pathology Congress-2017 at Department of Veterinary Pathology, Veterinary College, Hebbal, Bengaluru, Karnataka, India organized by the Asian Society of Veterinary Pathologists and Indian Association of Veterinary Pathologist, 9-11 November 2017.
4. Act as a **Co-Chairman** for "Technical Session-VIII: Pet and Companion animal pathology" during National Symposium on "Recent Advances in Veterinary Pathology and Disease Diagnosis for Sustainable Livestock and Poultry Production" at Department of Veterinary Pathology, College of Veterinary Science and Animal Husbandry, Sardarkrushinagar Dantiwada AU, Sardarkrushinagar- 385 506, District: Banaskantha, Gujarat, India organized by the Indian Association of Veterinary Pathologist and Indian College of Veterinary Pathologist, 22-24 October, 2018.
5. **Act as Convener** in ICFMD functioning and monitoring committee (IFMC) constituted by ICAR
6. **Act as a Member Secretary for** Institutional Animal Ethics Committee of ICAR-International Centre for Foot and Mouth Disease, Arugul, Jatni-752050, Khurda, Odisha. Organized IAEC committee meeting at regular interval for smooth functioning of IAEC to conduct the experiment on animal as per the guideline of CPCSEA at ICAR-ICFMD premises.
7. **Act as Member Secretary for** Institutional Biosafety Committee (IBSC) by DBT for ICAR-Directorate of Foot and Mouth Disease, Mukteshwar vide OM- BT/BS/17/781/2018-PID dated 08.01.2019. Organized IBSC meeting at regular interval for smooth functioning of IBSC to carry out research involving genetically modified organisms (GMOS)/ living modified organisms (LMOS) for development of rDNA products for healthcare and industrial use at ICAR-DFMD.
8. **Act as DBT Nominee for IBSC of RMRC, Bhubaneswar,** Odisha since 11th November, 2020.

Membership in Scientific Societies:

1. Bihar State Veterinary Council (BSVC).
2. Indian Association of Veterinary Pathologist (IAVP)- IAVP/R-72/2007 dated 10/08/2007.
3. Indian Veterinary Journal (IVJ) – 3611.
4. Veterinary Council of India (VCI)- Reg. No.- 2503 dated 02/11/2004
5. Indian Journal of Animal Sciences- Sub Id- S013102.
6. Life member of Laboratory Animal Science Association of India (LASAI)- ID 628.
7. Life member of Dr. C.M. Singh Endowment Trust- No. 63 LM/2012
8. Life Member of Society for Biosafety, India, Serial No.-SBS/295-2019 dated 18/01/2019.

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