

# LOK RAJ JOSHI

## Postdoctoral Research Fellow

Ragon Institute of MGH, MIT and Harvard  
Harvard Medical School  
400 Technology Square, Cambridge, MA

**Research interests:** Gene therapy, Viral immunology, Vaccine development, Antibody development, Viral pathogenesis, Reverse genetics, Viral bioinformatics

## EDUCATION

- 2021 ● **PhD. (Biomedical and Biological Sciences)**  
Cornell University 📍 Ithaca, NY
  - Graduated: August, 2021
  - Poxvirus-based vaccine development for swine influenza virus
  - Using viral transcriptomics to understand temporal gene regulation of poxvirus
  - Developing monoclonal antibody against SARS-CoV-2 for therapeutic and diagnostic use
  - Animal models of SARS-CoV-2 infection
- 2017 ● **MS in Biological Science**  
South Dakota State University 📍 Brookings, SD
- 2013 ● **Bachelor of Veterinary Science (DVM)**  
Tribhuvan University 📍 Nepal

## RESEARCH EXPERIENCE

- on going | 2021 ● **Postdoctoral Research Fellow**  
Ragon Institute of MGH MIT Harvard 📍 Cambridge, MA
- 2021 | 2019 ● **Graduate Research Assistant**  
Diel Lab (Cornell University) 📍 Ithaca, NY
- 2018 | 2015 ● **Graduate Research Assistant**  
Diel Lab (South Dakota State University) 📍 Brookings, SD

## CONTACT

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- 📍 400 Technology Square,  
Cambridge MA

2013  
|  
2012

- **Research Intern**  
Regional Veterinary Diagnostic Lab

📍 Nepal

## ☰ RESEARCH PROJECTS

- **Developing vector mediated antibody gene transfer technology for the prevention and treatment of HIV**  
Working at the interface of immunology and virology to develop effective HIV immunoprophylaxis technology
- **Pathogenesis of emerging viruses**  
Conducted several pathogenesis studies in pig models to understand pathogenesis of Senecavirus A, encephalomyocarditis virus (EMCV). Recently, working on the study aimed at developing small animal models for SARS-CoV-2.
- **Developing vectored-vaccine against porcine epidemic diarrhea virus**  
Developed orf virus based vectored vaccine against coronavirus of pigs, porcine epidemic diarrhoea virus (PEDV)
- **Developing vectored-vaccine against swine influenza virus**  
Developed orf virus based vectored vaccine against swine influenza virus
- **Monoclonal and polyclonal antibody development**  
Developing monoclonal and polyclonal antibodies against emerging coronavirus SADS-CoV and SARS-CoV-2.
- **Viral Metagenomics**  
Using clinical samples submitted to veterinary diagnostic lab to identify viral infections
- **Viral Transcriptomics**  
Using RNA Seq to understand temporal gene regulation of orthopoxvirus Orf virus
- **Genetic evolution of Senecavirus A**  
Using next generation sequencing to understand genetic evolution of picornavirus Senecavirus A
- **Epitope mapping and diagnostic assay development**  
Worked on the epitope mapping of spike protein of porcine epidemic diarrhea virus.

## 📄 PEER-REVIEWED ARTICLES

2021

- [\*\*Age-Related Susceptibility of Ferrets to SARS-CoV-2 Infection\*\*](#)  
Mathias Martins, Maureen HV Fernandes, Lok R Joshi, Diego G Diel  
📍 Journal of Virology

- 2021 ● **Severe SARS-CoV-2 infection in a cat with hypertrophic cardiaopathy**  
FR Carvallo, M Martins, \*\* LR Joshi\*\*, LC Caserta, PK Mitchell, T Cecere, S Hancock, EL Goodrich, J Murphy, DG Diel  
📍 Viruses
- 2021 ● **Development of a quantitative COVID-19 multiplex assay and its use for serological surveillance in a low SARS-CoV-2 incidence community**  
Cassandra Guarino, Elisabeth Larson, Susanna Babasyan, Alicia Rollins, **Lok R. Joshi**, Melissa Laverack, Lara Parrilla, Elizabeth Plocharczyk, Diego G. Diel, Bettina Wagner  
📍 PLOS ONE
- 2021 ● **Protective efficacy of an orf virus–vector encoding the hemmagglutinin and the nucleoprotein of influenza A virus in swine**  
**Lok Raj Joshi**, David Knudsen, Pablo Pineyro, Santosh Dhakal, Renukadhyra Gaourapura, Diego Diel  
📍 Frontiers in Immunology
- 2020 ● **Poxvirus Vectors. In: Vanniasinkam T., Tikoo S.K., Samal S.K. (eds) Viral Vectors in Veterinary Vaccine Development**  
**Lok R Joshi**, Diego G Diel  
📍 Viral Vectors in Veterinary Vaccine Development
- 2019 ● **Detection of Fowlpox virus carrying distinct genome segments of Reticuloendotheliosis virus**  
**Lok R Joshi**, Fernando V Bauermann, Kyle S Hain, Gerald F Kutish, Anibal G Armin, Chad P Lehman, Regg Neiger, Claudio L Afonso, Deoki N Tripathy, Diego G Diel  
📍 Virus Research
- 2019 ● **Identification and genetic characterization of a porcine hepe-astrovirus (bastrovirus) in the United States**  
Fernando V Bauermann, Ben Hause, Alaine R Buysse, **Lok R Joshi**, Diego G Diel  
📍 Archives of Virology
- 2019 ● **Genetic diversity and evolution of the emerging picornavirus Senecavirus A**  
**Lok R Joshi**, Kristin A Mohr, Danielle Gava, Gerald Kutish, Alaire S Buysse, Fabio A Vannucci, Pablo E Pieyro, Beate M Crossley, John J Schiltz, Melinda Jenkins-Moore, Leo Koster, Rachel Tell, Rejane Schaefer, Douglas Marthaler, Diego G Diel  
📍 Journal of General Virology
- 2019 ● **Persistent infection and transmission of Senecavirus A from carrier sows to contact piglets**  
Mayara F Maggioli, Maureen HV Fernandes, **Lok R Joshi**, Bishwas Sharma, Megan M Tweet, Jessica CG Noll, Fernando V Bauermann, Diego G Diel  
📍 Journal of Virology

- 2019 ● **Deletion of the thymidine kinase gene attenuates Caprine alphaherpesvirus in goats**  
Jessica Caroline Gomes Noll, **Lok Raj Joshi**, Gabriela Mansano do Nascimento, Maureen Hoch Vieira Fernandes, Bishwas Sharma, Eduardo Furtado Flores, Diego Gustavo Diel  
📍 Veterinary Microbiology
- 2019 ● **A novel live attenuated vaccine candidate protects against heterologous Senecavirus A challenge**  
Bishwas Sharma, Maureen HV Fernandes, Marcelo De Lima, **Lok R Joshi**, Steve Lawson, Diego G Diel  
📍 Frontiers in Immunology
- 2019 ● **Senecavirus A 3C protease mediates host cell apoptosis late in infection**  
Maureen HV Fernandes, Mayara F Maggioli, Jaelin Otta, **Lok R Joshi**, Steve Lawson, Diego G Diel  
📍 Frontiers in Immunology
- 2018 ● **Adaptive immune responses following Senecavirus A infection in pigs**  
Mayara F Maggioli, Steve Lawson, Marcelo de Lima, **Lok R Joshi**, Tatiane C Faccin, Fernando V Bauermann, Diego G Diel  
📍 Journal of Virology
- 2018 ● **Pathogenicity and cross-reactive immune responses of a historical and a contemporary Senecavirus a strains in pigs**  
Maureen HV Fernandes, Mayara F Maggioli, **Lok R Joshi**, Travis Clement, Tatiane C Faccin, Rolf Rauh, Fernando V Bauermann, Diego G Diel  
📍 Virology
- 2018 ● **Passive immunity to porcine epidemic diarrhea virus following immunization of pregnant gilts with a recombinant orf virus vector expressing the spike protein**  
**Lok R Joshi**, Faten A Okda, Aaron Singrey, Mayara F Maggioli, Tatiane C Faccin, Maureen HV Fernandes, Kyle S Hain, Scott Dee, Fernando V Bauermann, Eric A Nelson, Diego G Diel  
📍 Archives of Virology
- 2017 ● **The S2 glycoprotein subunit of porcine epidemic diarrhea virus contains immunodominant neutralizing epitopes**  
Faten A Okda, Steven Lawson, Aaron Singrey, Julie Nelson, Kyle S Hain, **Lok R Joshi**, Jane Christopher-Hennings, Eric A Nelson, Diego G Diel  
📍 Virology
- 2017 ● **A novel bovine papillomavirus type in the genus Dyokappapapillomavirus**  
Fernando V Bauermann, **Lok R Joshi**, Kristin A Mohr, Gerald F Kutish, Petra Meier, Christopher Chase, Jane Christopher-Hennings, Diego G Diel  
📍 Archives of Virology

- 2017 ● **Immunogenicity of ORFV-based vectors expressing the rabies virus glycoprotein in livestock species**  
Mathias Martins, **Lok R Joshi**, Fernando S Rodrigues, Deniz Anziliero, Rafael Frandoloso, Gerald F Kutish, Daniel L Rock, Rudi Weiblen, Eduardo F Flores, Diego G Diel  
📍 Virology
- 2016 ● **Pathogenesis of Senecavirus A infection in finishing pigs**  
**Lok R Joshi**, Maureen HV Fernandes, Travis Clement, Steven Lawson, Angela Pillatzki, Talita P Resende, Fabio A Vannucci, Gerald F Kutish, Eric A Nelson, Diego G Diel  
📍 Journal of General Virology
- 2016 ● **Detection of the emerging picornavirus Senecavirus A in pigs, mice, and houseflies**  
**Lok R Joshi**, Kristin A Mohr, Travis Clement, Kyle S Hain, Bryan Myers, Joseph Yaros, Eric A Nelson, Jane Christopher-Hennings, Danielle Gava, Rejane Schaefer, Luizinho Caron, Scott Dee, Diego G Diel  
📍 Journal of Clinical Microbiology
- 2016 ● **Immunogenicity of a Recombinant Parapoxvirus Expressing the Spike Protein of Porcine Epidemic Diarrhea Virus.**  
Diel DG Hain KS, **Joshi LR**, Okda F, Nelson J, Singrey A, Lawson S, Martins M, Pillatzki A, Kutish G, Nelson EA, Flores EF  
📍 Journal of General Virology
- 2016 ● **Genetic characterization and phylogenetic analysis of senecavirus A circulating in the US and in Brazil.**  
D Gava, **LR Joshi**, KA Mohr, V Haach, L Caron, R Schaefer, DG Diel  
📍 Embrapa Sunos e Aves-Resumo em anais de congresso (ALICE)
- 2016 ● **Neonatal pig mortality associated with senecavirus A.**  
D Gava, MP Lorenzett, V Haach, D Driemeier, **LR Joshi**, KA Mohr, DG Diel, L Caron, N Mores, MAZ Mores, R Schaefer  
📍 Embrapa Sunos e Aves-Resumo em anais de congresso (ALICE)
- 2015 ● **Senecavirus A: A Newly Emerging Picornavirus of Swine**  
**Lok R Joshi**, Diego G Diel  
📍 EC Microbiology
- 2014 ● **Prevalence of methicillin-resistant Staphylococcus aureus (MRSA) in dairy farms of Pokhara, Nepal.**  
**LR Joshi**, A Tiwari, SP Devkota, S Khatriwada, S Paudyal, KR Pande  
📍 International Journal of Veterinary Science
- 2014 ● **Prevalence of Vancomycin Resistant Enterococci Species in Minced Buffalo Meat of Chitwan, Nepal**  
Sudeep Ghimire, Hom Bahadur Basnet, **Lok Raj Joshi**, Maheshwar Sapkota  
📍 International Journal of Applied Sciences and Biotechnology
- 2014 ● **Methicillin-Resistant Staphylococcus Aureus (MRSA) in Cattle: Epidemiology and Zoonotic Implications**  
**Lok Raj Joshi**, Shiva Prasad Devkota  
📍 International Journal of Applied Sciences and Biotechnology

2013

- **Study on the prevalence of Cryptosporidium in calves and HIV infected humans in the periphery of river basins of Kathmandu valley**

S Paudyal, SR Karna, SJ Khatriwada, LR Joshi, A Tiwari, SP Shrestha  
📍 International Journal of Infection and Microbiology

## ORAL AND POSTER PRESENTATIONS

2019

- **Orf virus based vectored vaccine induces protective immunity to swine influenza virus**

Lok Raj Joshi, Bishwas Sharma, Maureen Fernandez, Jessica Noll, Gabriela Mansano, Leonardo Caserta, Renukaradhya Gaurapura, Diego Diel

📍 CRWAD, Chicago (Oral Presentation)

2018

- **Co-infection with fowlpox virus strains carrying variable sequences of reticuloendotheliosis virus**

Tripathy, D.N., Joshi L.R., Hain K.S., Kutish G.F., Armien A.G., Lehman, P.C., Leslie-Steen, P., Neiger, R., Diel, DG

📍 American Association of Avian Pathologists Annual Meeting (Abstract)

2017

- **Passive immunity to porcine epidemic diarrhea virus following immunization of pregnant gilts with a recombinant orf virus vector expressing the spike protein.**

Joshi, Lok R., Faten A. Okda, Aaron Singrey, Mayara F. Maggioli, Tatiane C. Faccin, Maureen HV Fernandes, Kyle S. Hain, Diego G Diel

📍 CRWAD, Chicago (Oral Presentation)

2016

- **Pathogenesis and infection dynamics of Senecavirus A in pigs.**

Joshi, L.R., Fernandes, M.V.H., Clement, T., Lawson, S., Resende, T.P., Vannucci, F.A., Nelson, E.A., Diel D.G

📍 CRWAD, Chicago (Oral Presentation)

2016

- **Evaluation of immunodominant B- and T-cell epitopes as inducers of protective immunity against porcine reproductive and respiratory syndrome virus**

Fernandes, MHV., Okda, F., Joshi, L.R., Hain, KS., Nelson, EA., Christopher-Hennings, J., Osorio, FA., Vu, H., Diel, DG  
📍 PRRSV Symposium, Chicago (Poster)

2016

- **Genetic characterization and phylogenetic analysis of Senecavirus A. North American PRRSV and other emerging viruses Symposium**

Joshi, L.R., Mohr, K.A., Gava, D., Kutish, G., Pineyro, P., Zhang, J., Caron, L., Schaefer, R., Diel, DG

📍 PRRSV Symposium, Chicago (Poster)

## ❖ AWARDS AND SCHOLARSHIPS

- |      |  |
|------|--|
| 2020 | <ul style="list-style-type: none"><li>● <b>Travel Award</b><br/>Travel award to attend Systems Biology of Infectious Disease Workshop (2020)<br/> Center for Viral Systems Biology, Scripps Institute</li></ul> |
| 2019 | <ul style="list-style-type: none"><li>● <b>Diversity scholarship</b><br/>Travel grant to attend rstudio::conf(2019)<br/> R Studio</li></ul>  |
| 2018 | <ul style="list-style-type: none"><li>● <b>Best Paper Award</b><br/>Best PhD paper award<br/> SDSU Sigma XI</li></ul>   |
| 2018 | <ul style="list-style-type: none"><li>● <b>Bioimaging Contest</b><br/>Third Position<br/> SDSU Dept of Microbiology</li></ul>   |
| 2016 | <ul style="list-style-type: none"><li>● <b>Best Oral Presentation Award</b><br/>Best student oral presentation given at CRWAD meeting<br/> American College of Veterinary Microbiologists</li></ul>             |
| 2016 | <ul style="list-style-type: none"><li>● <b>Sigma XI Paper Competition</b><br/>Second Position<br/> SDSU Sigma XI</li></ul>  |
| 2015 | <ul style="list-style-type: none"><li>● <b>Sigma XI Proposal Competition</b><br/>Second Position<br/> SDSU Sigma XI</li></ul>   |
| 2010 | <ul style="list-style-type: none"><li>● <b>Diligent Student Scholarship</b><br/>Given to meritorious student pursuing career in STEM in Nepal<br/> Nepal Government</li></ul>                                 |
| 2009 | <ul style="list-style-type: none"><li>● <b>National Level Story Writing Competition</b><br/>First Award<br/> USAID Nepal</li></ul>  |
| 2008 | <ul style="list-style-type: none"><li>● <b>Merit Scholarship</b><br/>Scholarship to study B.V.Sc at Institute of Agriculture and Animal Science<br/> Tribhuvan University Nepal</li></ul>                     |
| 2006 | <ul style="list-style-type: none"><li>● <b>Essay Writing Competition</b><br/>First Award<br/> NIST College</li></ul>  |