BIOGRAPHICAL SKETCH

NAME: **Rajiv Kumar**

Date of Birth: **14-11-1982**

POSITION TITLE: Assistant Professor

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date YYYY	FIELD OF STUDY
B.R.A. Bihar University	B. Sc.	2003	Chemistry (Hons.)
Banaras Hindu University	M. Sc.	2006	Biochemistry
Banaras Hindu University	PhD	2011	Biochemistry
Queensland Institute of Medical Research, Australia	Postdoc	2014	Immunology & Infection
Laboratory of Parasitic Diseases, NIH-USA		2009	Parasitic Disease (Visiting Research Fellow)

A. Personal Statement

I am Assistant Professor at Centre of Experimental Medicine & Surgery, Institute of Medical Sciences, Banaras Hindu University, Varanasi-India. My research interests are to understand the immune mechanisms underlying the progression of diseases such as Malaria and Visceral Leishmaniasis, and to distinguish anti-parasitic host immune responses that control disease from the responses that cause disease. Presently, I am focused on investigating the role of regulatory cell surface molecules and cytokines in pathogenesis of these diseases. I have a broad background in cellular and molecular immunology of infectious diseases, as well as significant field and epidemiological work experience. I received training at NIAID, NIH in Bethesda, USA during my PhD, and at QIMR Berghofer Medical Research Institute, Brisbane, Australia, during my post-doctoral work. At QIMR, I developed research aimed at understanding the pathogenesis of severe malaria syndromes and developing immune modulators to improve vaccines and enhance current therapies. I used both experimental systems (mouse models of malaria), as well as unique human challenge systems that we have set up at QIMR. Currently, I am a PI on a Department of Science and Technology, Government of India funded project where I am looking at the role of Tim-3/Galectin-9 pathway in pathogenesis of Malaria/Viceral Leishmaniasis (VL). I am also a co-investigator in an NIH-funded Tropical Medicine Research Center (P50) grant running at Banaras Hindu University, and Australian NHMRC Research grant. I've worked with several other international research institutes and scientists as revealed by my publications.

B. Position, Honors & Awards

Positions and Honors:

2007-2009 Indian Council of Medical Research-Junior Research Fellowship
2009- 2012 Indian Council of Medical Research - Senior Research Fellowship
Dec 2011-Sep 2012 Key Investigator NIH-TMRC Project (Immunology) at Banaras Hindu University:
Oct 2012-Oct 2014 Post-Doctoral Research Officer at QIMR, Brisbane-Australia
Dec. 2014- Till Now Visiting Scientist at QIMR, Brisbane-Australia
Nov 2014-May 2015 INSPIRE Faculty at N.I.T- Rourkela (Odisha), India
June 2015- May 2016 INSPIRE Faculty at Netaji Subhas Institute of Technology (University of Delhi), New

Delhi, India
June 2016- Nov. 2018 INSPIRE Faculty at Department of Biochemistry, Institute of Science, Banaras Hindu University, Varanasi, India

Awards:
2016: Rashtriya Gaurav Award
2016: American Association of Immunologists (AAI) Early Career Faculty Travel Award
2016: American Association of Immunologists (AAI) International Travel Award
2015: DST (Govt. of India) Travel Award
2014: DST INSPIRE Faculty Award
2011: CSIR Travel Award
2010: DST Travel Award

Memberships:
2017-present Swedish Immunology Society
2015- present American Association of Immunologists (AAI)
2015- present Indian Immunology Society (IIS)
2015- present American Society of Tropical Medicine & Hygiene (ASTMH)
2015- present South African Immunology Society (SAIS)
2013- present International Society of Infectious Diseases (ISID)

Reviewer/Editorial Board Membership

PLoS Neglected Tropical Diseases
PLoS One
Frontiers in Immunology
Scientific Reports
Infection and Immunity
Clinical and Translational Immunology
Parasitology International
International Journal of Parasitology
Cytokine
American Journal of Tropical Medicine and Hygiene
Review Editor: Microbial Immunology Section (Frontiers in Immunology & Frontiers in Microbiology)

C. Conferences/Seminar/Symposium

1. Organized symposium on "Targeting Inhibitory Molecules and Immune Check Point Targets for Host Directed Therapy in Leishmaniasis" during 67th Annual Meeting of American Society of Tropical Medicine & Hygiene, 28 Oct-02 Nov. 2018 at **New Orleans, USA.**

2.66th Annual Meeting of American Society of Tropical Medicine & Hygiene, 05-09 Nov. 2017 at **Baltimore, USA:** Oral presentation of the topic entitled "Targeting inhibitory receptors Lag-3 and Tim-3 to enhance anti-parasitic immune responses during visceral leishmaniasis".

3. 2nd BRICS young scientist Conclave, 10-15 July, 2017 at Zheziang University, Hangzhou, China: Oral presentation on the topic entitled "Targeting CD4+ T cells to enhance anti-parasitic immunity".

4. 6th Worldleish conference, 16-20 May, 2017 at **Toledo, Spain**: Oral presentation on the topic entitled "Targeting inhibitory receptors Lag-3 and Tim-3 to enhance anti-parasitic immune responses during visceral leishmaniasis"

5. 16th Annual Meeting of International Congress of Immunology, 21-27 Aug. 2016 at **Melbourne, Australia**: Oral presentation on the topic entitled "Type-1 IFN signaling suppresses anti parasitic CD4^{+} T cells response during visceral leishmaniasis".

6. 64th Annual Meeting of American Society of Tropical Medicine & Hygiene, 25-29 Oct. 2015 at **Philadelphia, USA:** Poster presentation of the topic entitled "Type-1 IFN signaling suppresses anti parasitic $CD4^+$ T cells response during visceral leishmaniasis".

7. 43rd Annual Meeting of Australian Society of Immunology (ASI), 02-05 Dec. 2013 at **Wellington, New Zealand**: Oral Presentation on the topic entitled "Leishmania Specific CD4+ T cells releases IFNγ that limits parasite replication in patients with visceral leishmaniasis".

8. 2nd International Conference on Perspectives of Cell Signaling And Molecular Medicines, 08-11 January, 2012 at **Bose Institute, Kolkata, India**.

9. Global Infectious Disease: A Multidisciplinary Approach. 04-10 Sep. 2011 at International centre for Genetic Engineering and Biotechnology **(ICGEB), Cape Town, South Africa: Oral Presentation** on the topic entitled IL-27 and IL-21 are associated with T cells IL-10 responses in human visceral leishmaniasis.

10. Theoretical and practical course: Molecular Biology of Leishmania. 27-29 Oct.2010 at International centre for Genetic Engineering and Biotechnology **(ICGEB), Trieste, Italy: Poster presentation** on the topic entitled *"Study of Toll Like Receptors 2, 4 and 9 in Indian Visceral Leishmaniasis"*

11. 2nd National Hands on Workshop on Multiplex Bead Array Technology at Bio-Red Laboratories India Ltd., Gurgaon from 10-11 August, 2010.

12**.** 4th Worldleish conference organized at Lucknow, India from 3-7 February 2009.

13. 8th Indo-US workshop on Flow Cytometry and First Annual Meeting of The Cytometry Society organized at Sanjay Gandhi Post Graduate Institute of Medical Sciences, Lucknow, India from 19-22 Dec. 2007.

D. Research Publications (h-index=18, citations so far: 1154)

1. Kumar R*, Susanna Ng, Engwerda CR*. The role of IL-10 in Malaria: A double edged sword. **Frontiers in Immunology**, 2019, 10:229. **(* Corresponding author) [Impact Factor: 5.51]**
2. Chauhan SB, Faleiro R, Kumar R, Susanna Ng, Singh B, Singh OP, Singh SS, Amante F, Rivera F, Rai M, Chakravarty J, Sacks D, Nylen S, Sundar S, Engwerda CR. IL-2 is an upstream regulator of $CD4^+$ T cells from visceral leishmaniasis patients with therapeutic potential. **Journal of Infectious Diseases**. 2019; 220 (1): 163-173 **IF: 5.18]**
3. Edwards CL, Montes de Oca M, Rivera F, **Kumar R**, Ng S, Wang Y, Amante F,Kometani K,Kurosaki T,Sidwell T, Kallies A, Engwerda C. The role of BACH2 in T cells in experimental malaria caused by Plasmodium chabaudi chabaudi AS. **Frontiers in Immunology** 2018; 9:2578. **[Impact Factor: 5.51]**
4. Bunn P.T, Montes de Oca M, Rivera F, **Kumar R**, Ng S, Edwards CL, Faleiro RJ, Sheel M, Amante F, Muller W, Haque A, Uzonna JE, Hill GR, Engwerda CR. Distinct roles for CD4+ FoxP3+ regulatory T cells and IL-10-mediated immunoregulatory mechanisms during experimental visceral leishmaniasis caused by Leishmania donovani. **Journal of Immunology** 2018 Dec 1;201(11):3362-3372**. [Impact Factor: 4.53]**
5. Singh N, **Kumar R**, Chauhan SB, Engwerda CR, Sundar S. Peripheral blood monocytes with an anti-inflammatory phenotype display limited phagocytosis and oxidative burst in visceral leishmaniasis patients. **Journal of Infectious Disease** 2018; 218(7): 1130-1141 **[Impact Factor: 5.18]**
6. Ng S, Souza-Fonseca-Guimaraes F, Rivera F, Amante F**, Kumar R……** and Engwerda CR**.** Rapid loss of group 1 innate lymphoid cells during blood stage Plasmodium infection. **Clinical and Translational Immunology** 2018; 7(1):e1003 **[ScopusCite Score : 7.27]**
7. **Kumar R***, Chauhan SB, Ng S, Sundar S, Engwerda CR*. Immune checkpoint targets for host directed therapy to prevent and treat leishmaniasis. **Frontiers in Immunology**, 2017; 8:1492 **(* Corresponding author) [Impact Factor: 5.51]**
8. Bunn PT, Montes de Oca M, Rivera F, **Kumar R**, Edwards C, Faleiro RJ, Sheel M, Wang Y, Amante F, Haque A, Engwerda CR. *Galectin-1 impairs the generation of anti parasitic Th1 cell responses in the liver*

during experimental visceral leishmaniasis. **Frontiers in Immunology**, 2017; 8:1307 **[Impact Factor: 5.51]**

9. Sharma S, Srivastva S, Davis R, Singh S, **Kumar R**, Nylen S, Wilson Mary, Sundar S. *"The Phenotype of Circulating Neutrophils during Visceral Leishmaniasis"*. **American Journal of Tropical Medicine and Hygiene** 2017 97(3):767-770 **[Impact Factor: 2.82]**

10. Montes de Oca M, **Kumar R,** Rivera F, Fiona H. Amante F, Sheel M, Faleiro RJ, Bunn PT, Best SE, Beattie L, Ng S, Edwards CL, Boyle GM, Marquart L, Haque A, Piera KA, Woodberry T, Price R, Anstey NM, Burel J, Doolan DL, McCarthy JS and Engwerda CR. *"Type I interferons regulate immune responses in humans with blood-stage Plasmodium falciparum infection."* **Cell Reports** 2016, 17 (2): 399-412 **[Impact Factor: 8.03]**

11. Singh N, **Kumar R***, Engwerda C, sacks D, Nylen S, Sundar S***. "***Tumor Necrosis Factor Alpha neutralization has no direct effect on parasite burden, but causes impaired IFN-γ production by spleen cells from human visceral leishmaniasis patients"*. **Cytokine** 2016, 85 184-190**. (* Corresponding author) [Impact Factor: 3.51].**

12. Faleiro R*, **Kumar R***#, Bunn PT, Singh N, Chauhan SB, Sheel M, Amante F, Montes de Oca M, Edward CL, Ng S, Best SE, Haque A, Beattie L, Hafner L, Sacks D, Nylen S, Sundar S and Engwerda CR#. "*Combined immune therapy for the treatment of visceral leishmaniasis"*. **PLoS Neglected Tropical Disease** 2016 Feb 12;10(2):e0004415. **(* Joint 1st Author & # Corresponding author). [Impact Factor: 4.36].**

13. Montes de Oca M, **Kumar R,** Rivera F, Fiona H. Amante F, Sheel M, Faleiro RJ, Bunn PT, Best SE, Beattie L, Ng S, Edwards CL, Muller W, Cretney E, Nutt SL,Smyth MJ, l Haque A, Hill GR, Sundar S, Kallies A and Engwerda CR. "*Blimp1-dependent IL-10 production by Tr1 cells regulates TNF-mediated tissue pathology"*. **PLoS Pathogen** 2016 Jan 14;12(1):e1005398 **[Impact Factor: 6.15].**

14. Lahiry S, Khanra S, **Kumar R**, Chakraborty A, Sundar S, Sudarshan M, Manna M. "*Particle induced X-ray emission study of blood samples of Indian Kala-azar patients".* **Journal of Parasitic Disease** 2017;41(1):193-198

15. Lahiry S, **Kumar R**, Sundar S, Chakraborty A, Sudarshan M, Manna M. " *Energy Dispersive X-Ray Fluorescence (EDXRF) Study of the Blood Samples of Indian Kala-Azar Patients".* **RJPBCS**, 2016: 7(4): 2267-2272.

16. Sheel M, Beattie L , Rivera F, , Faleiro RJ Bunn PT, Montes de Oca M, Edwards CL, Ng S, **Kumar R**, Amante F, Best SE, McColl S, Varelias A , MacDonald K, Smyth MJ, l Haque A, Hill GR, and Engwerda CR. "*Interleukin 17A producing γδ T cells suppress early control of parasite growth by monocytes in the liver"*. **Journal of Immunology** 2015;195(12):5707-17**. [Impact Factor: 4.53].**

17. Bhattacharyya T, Ayandeh A, Falconar AK, Sundar S, El-Safi S, Gripenberg MA, Bowes DE, Thunissen C, Singh OP, **Kumar R**, Ahmed O, Eisa O, Saad A, Pereira SS, Boelaert M, Mertens P, Miles MA. "*IgG1 as a Potential Biomarker of Post-Chemotherapeutic Relapse in Visceral Leishmaniasis, and Adaptation to a Rapid Diagnostic Test"*. **PLoS Neglected Tropical Disease** 2014; 8(10):e3273 **[Impact Factor: 4.36].**

18. Kumar R, Singh N, Gautam S, Singh OP, Gidwani K, Rai M, Sacks D, Sundar S, Nylen S. "*Leishmania specific CD4 T cells release IFNγ that limit parasite replication in patients with visceral leishmaniasis".* PLoS Neglected Tropical Disease 2014; 8(10):e3198 **[Impact Factor: 4.36].**

19. Kumar R, Singh OP, Gautam S, , Nylen S Sundar S. "*Enhanced expression of of Toll-like Receptors 2,4 but not 9, in spleen tissue from patients with Visceral Leishmaniasis".* **Parasite Immunology** 2014, 36 (12): 721-725. **[Impact Factor: 2.83]**

20. Bhattacharyya T,Bowes DE, El-Safi S, Sundar S,Falconar AK, Singh OP, **Kumar R**, Osman O, Boelaert M, Miles MA. "Significantly lower anti-Leishmania IgG responses in Sudanese versus Indian visceral leishmaniasis". **PLoS Neglected Tropical Disease** 2014; 8(2): e2675 **[Impact Factor: 4.36]**

21. Gautam S, **Kumar R**, Singh N, Singh A, Rai M, Sacks D, Sundar S, Nylen S. *"CD8 T cell Exhaustion in Human Visceral Leishmaniasis"*. **Journal of Infectious Disease**; 2014 15;209(2):290-9 **[Impact Factor: 5.18]**

22. Faleiro RJ, **Kumar R**, Hafner LM, Engwerda CR. *"Immune regulation during chronic visceral leishmaniasis".* **PLoS Neglected Tropical Disease**, 2014; 8(7):e2914**. [Impact Factor: 4.36].**

23. **Kumar R**, Engwerda C. *"Vaccines to prevent leishmaniasis".* **Clinical & Translational Immunology** 2014; 3: e13; doi:10.1038/cti.2014.4**. [ScopusCite Score : 7.27]**

24. Engwerda C, **Kumar R**. *"Mast Cell Fuel the Fire of Malaria Immunopathology".* **Nature Medicine**. 2013; 19 (6): 672-674. **[Impact Factor: 32.62]**

25. Singh OP, Gidwani K, **Kumar R**, Jones S, Boelaert M, Sacks D, Sundar S. *"Reassessment of immune correlates in human visceral leishmaniasis as defined by cytokine release in whole blood"* . **Clinical and Vaccine Immunology** 2012; 19(6):961-966**.[Impact Factor: 2.87].**

26. **Kumar R,** Nylén S. *"Immuno-biology of Visceral Leishmaniasis".* **Frontiers in Immunology.** 2012; 3: 251**. [Impact factor: 5.51]**

27. Chakaravorty J, Kumar S, **Kumar R**, Gautam S, Sundar S. *Evaluation of rK39 immunochromatographic test with urine for diagnosis of visceral leishmaniasis.* **Transactions of Royal Society of Tropical Medicine and Hygiene** 2011 Sep; 105(9):537-539. **[Impact Factor: 2.82].**

28. Gautam S[*],**Kumar R[*]**, Maurya R[*], Nylén S, Ansari N, Rai M, Sundar S, Sacks D. IL-10 neutralization promotes parasite clearance in splenic aspirate cells from patients with visceral leishmaniasis. **Journal of Infectious Disease** 2011; 204(7):1134-1137 **(*Joint 1st Author)**. **[Impact Factor: 5.18]**

29. Ansari N[*],**Kumar R[*]**, Gautam S, Nylén S, Singh OP, Sundar S, Sacks D. *IL-27 and IL-21 are associated with T cell IL-10 responses in human visceral leishmaniasis.* **Journal of Immunology** 2011: Apr 1; 186(7):3977-3985 **(*Joint 1st Author)**. **[Impact Factor: 4.53].**

30. Gidwani K, Jones S, **Kumar R**, Boelaert M, Sundar S. *Interferon-gamma Release Assay (modified QuantiFERON®) as a potential marker of infection for Leishmania donovani, a proof of concept study.* **PLoS Neglected Tropical Disease** 5 (4): e1042. **[Impact Factor: 4.36].**

31. Gidwani K, Picado A, Ostyn B, Singh SP**, Kumar R**, Khanal B, Lejon V, Chappuis F, Boelaert M, Sundar S. *Persistence of Leishmania donovani antibodies in past visceral leishmaniasis cases in Indi***a. Clinical and Vaccine Immunology** 2011; 18(2):346-348. **[Impact Factor: 2.87]**

32. Picado A, Singh SP, Rijal S, Sundar S, Ostyn B, Chappius F, Uranw S, Gidwani K, Khanal B, **Kumar R**, Srivastav P, Dujardin JC, Boelaert M. *Longlasting insecticidal nets for prevention of Leishmania donovani infection in India and Nepal: paired cluster randomized trial.* **British Medical Journal** 2010; 341:c6760. **[Impact Factor: 23.25]**

33. Maurya R, **Kumar R**, Prajapati VK, Manandhar KD, Sacks D, Sundar S, Nylén S. *"Human visceral leishmaniasis is not associated with expansion or accumulation of Foxp3+ CD4 cells in blood or spleen".* **Parasite Immunology** 2010;32: 479-483. **[Impact Factor: 2.83]**

34. Kumar R, Goto Y, Gidwani K, Cowgill KD, Sundar S, Reed SG. "*Evaluation of ex vivo Human Immune Response Against Candidate Antigens for a Visceral Leishmaniasis Vaccine*". **American Journal of Tropical Medicine and Hygiene** 2010; 82(5): 808-813**. [Impact Factor: 2.56]**

35. Clements MF*,Gidwani K*,**Kumar R***, Hostomska J, Dinesh D, Kumar V, Das P, Müller I, Hamilton G, Volfova V, Boelaert M, Das M, Rijal S, Picado A, Volf P, Sundar S, Davies CR, Rogers ME. "*Measurement of recent exposure to Phlebotomus argentipes, the vector of Indian visceral leishmaniasis, By Using Human Antibody Responses to Sand Fly Saliva"*. **American Journal of Tropical Medicine and Hygiene** 2010; 82(5): 801-807**. (* Equal contribution) [Impact Factor: 2.56]**

36. Gidwani K, **Kumar R**, Rai M, Sundar S. *"Longitudinal Sero-epidemiologic Study of Visceral Leishmaniasis in Hyperendemic Region of Bihar, India"*. American Journal of Tropical Medicine and Hygiene 2009; 80(3): 345-346. **[Impact Factor: 2.56]**

Book Chapters

1. Kumar R, Susanna Ng, Engwerda CR. Immuno-modulation in Malaria. 2017; **Encyclopedia of Malaria** (Springer Publication)**.**

E. Research Support

Ongoing Research Support

INSPIRE Scheme, DST, Govt. of India **R. Kumar (PI)** **11/2014-10/2019**
Role of Tim-3/Galectin-9 Pathway in Pathogenesis of infectious diseases
The goal of this project is to understand the role of 'Tim-3/Galectin-9 pathway' in modulating the immune response in human malaria and visceral leishmaniasis.

5P50AI074321-09 **S. Sundar (PI)** **07/2017-06/2022**
NIH/NIAID
Visceral leishmaniasis in Bihar State, India
This is a Tropical Medicine Research Center (TMRC), which conducts research on the causes, diagnosis, prevention, and treatment of Visceral leishmaniasis (VL) in India, including creating and sustaining research capacity in-country. The goal of this project is to understand the epidemiology, immune response and genetics of human VL in Bihar state, an endemic region of India.
Role: Key-Investigator

APP1132975 **Engwerda CR (PI)** **2018-2022**
NHMRC, Australia
Tropical diseases: Translating discoveries into better health
This is a program grant where we are translating our finding from pre clinical model to human being for better designing the treatment and therapeutic options.
Role: Associate Investigator

Completed Research Support

India-Australia DBT Grant **S. Sundar (PI)** **04/2013-04/2016**
Engwerda CR (PI)

Designing Combination Immunotherapy and Drug Treatment to Control Chronic Infectious Diseases
The goal of this project is to test and refine optimal combination immune therapy that controls disease progression and parasite replication in animal model and patients with visceral leishmaniasis.
Role: Co-investigator