

Curriculum Vitae

Dipak K. Raj, PhD

Assistant Professor, Department of Pathology and Laboratory Medicine,
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EDUCATION

Undergraduate	Utkal University, BS in Life Science, 1996
Master of Science	Punjab University Chandigarh, MSc. in Biotechnology, 1997-1999
Graduate School	Utkal University, PhD in Molecular Biology, 1999-2005

POSTGRADUATE TRAINING

Postdoctoral Fellowship	National Institute of Health, Bethesda, MD, and Field of study: Identification of drug resistant gene and vaccine candidate for falciparum malaria. 2005-2010
Senior Research Associate	Centre for international Health (RIH)/ Brown University, Providence, RI. Field of study – Vaccine development for pediatric malaria. 2010- 2013

HONORS AND AWARDS

Judge in National science congress of India for high school science projects.	Govt. of India, 2000-2002
National Fellowship for master programm in biotechnology	Department of Biotechnology, Govt. India 1997-1998
Senior Research Fellowship for graduate program.	University Grant Commission, Govt of India 2002-2004
Research fellowship for visiting fellow	National Institute of Health, USA, 2005-2010

New Investigator award	Lifespan, Providence USA, 2011
Finalist, New Investigator award	Lifespan, Providence USA, 2012
Travel Award	North East Regional IDeA Conference in Burlington, VT in August, 2017
Research Training Award	Targeted Quantitative Proteomics Workshop, National Proteomics Resource Oklahoma INBRE, USA, 2018

ACADEMIC APPOINTMENTS

- 1999-2004 Senior Research Fellow, Institute of Life Sciences, DBT, India,
2004-2005 Consultant to Department of Vector research, Institute of Life Sciences, India,
2005-2010 Postdoctoral Fellow, LMVR/NIAID, National Institute of Health, USA
2010- Research Associate/Research Scientist, CIHR/ Rhode Island Hospital, USA
2014 - Assistant professor of Pathology and Laboratory Medicine, Brown University, USA

MEMBERSHIP IN SOCIETIES

- 2005- American Society of Tropical Medicine and Hygiene 1995- present
2001- Member of Indian Society of Parasitology

SCIENTIFIC REVIEW APPOINTMENTS

- 2003 Reviewer for Indian Science congress award for Children
2015- Editorial Board, "Journal of Science, Technology and Environment Informatics"
2015- Reviewer in "Journal of Molecular Biology Research"
2018 Nov- NIH/NIAID, The Small Business Innovation Research (**SBIR**) program
Grant Review, Panel.
2019 March- NIH/NIAID, The Small Business Innovation Research (**SBIR**) program
Grant Review, Panel.
2019 June- NIH/NIAID, The Small Business Innovation Research (**SBIR**) program
Grant Review, Panel.
2019 November- NIH/NIAID, Vaccines against Microbial Diseases (**VMD**) Exploratory/Developmental
Research Grant Award (R21), Grant Review, Panel.

PUBLICATIONS

1. **Raj DK**, Das BR, Dash AP and Supakar PC. Identification of telomerase activity in gametocytes of *Plasmodium falciparum*. **Biochemical and Biophysical Research Communication**. 2003; 309 (3): 685-8.
2. **Raj DK**, Das BR, Dash AP and Supakar PC. Genetic diversity in MSA-1 gene of *Plasmodium falciparum* in different malaria endemic localities. **American Journal of Tropical Medicine and Hygiene** 2004;71 (3):285-9.
3. **Raj DK**, Das BR, Dash AP and Supakar PC. Detection of a rare point mutation in the C-terminus conserve region of MSA-1 gene in *Plasmodium falciparum*. **Experimental Parasitology** 2004;106 (1-2): 45-49.
4. Mishra K, **Raj DK**, Dash AP and Hazra RK. Combined detection of *Brugia malayi* and *Wuchereria bancrofti* using single PCR. **Acta Troica**. 2005; 93(3): 233-7.
5. Mishra K, **Raj DK**, Dash AP and Hazra RK. A simple Para film based membrane-feeding method for in vivo radioisotope labeling of polypeptide in mosquitoes. **Annals of Tropical Medicine and Parasitology** 2005; 99(8) 803-806.
6. **Raj DK**, Mishra S, Das BR and Dash AP. *Plasmodium falciparum* Pfs25 gene promoter has no polymorphism in natural isolates of Eastern India **Acta Protozoologica** 2005; **44**, 289-292.
7. Mishra S, **Raj DK**, Dash AP, and Supakar PC. An efficient detection of chloroquine resistance marker in pfCRT gene of *Plasmodium falciparum* by PCR-SSCP analysis in eastern Indian isolates. **Transaction of Royal Society of Tropical Medicine and Hygiene** 2006; **100**(3): 243-7.
8. Mishra K, **Raj DK**, Hazra RK, Dash AP and Supakar PC. The development and evaluation of a single step multiplex PCR method for simultaneous detection of *Brugia malayi* and *Wuchereria bancrofti*. **Mol Cell Probes**. 2007; 21: 355-62.
9. **Raj DK**, Mu J, Jiang H, Kabat J, Singh S, Sullivan M, Fay MP, McCutchan TF, Su XZ. Disruption of a *Plasmodium falciparum* multidrug resistance-associated protein (PFMRP) alters its fitness and transport of antimalarial drugs and glutathione. **Journal of Biological Chemistry** 2010; Mar 20; 284(12):7687-96.
10. Eastman RT, Pattaradilokrat S, **Raj DK**, Dixit S, Deng B, Miura K, Yuan J, Tanaka TQ, Johnson RL, Jiang H, Huang R, Williamson K, Lambert LE, Long C, Austin CP, Wu Y and Su XZ. A Class of Tricyclic Compounds Blocking Malaria Oocyst Development and Transmission. **Antimicrobial Agents and Chemotherapy** 2012; Jan; 57(1): 425-35.
11. **Raj DK**, Nixon CP, Nixon CE, Dvorin JD, DiPetrillo CG, Pond-Tor S, Wu HW, Jolly G, Pischel L, Lu A, Michelow IC, Cheng L, Conteh S, McDonald EA, Absalon S, Holte SE, Friedman JF, Fried M, Duffy PE and Kurtis JD. Antibodies to PfSEA-1 block parasite egress from RBCs and protect against malaria infection. **Science** 2014; 344:871-7.
12. Nixon CE, Park S, Pond-Tor S, **Raj DK**, Lambert L, Orr-Gonzales S, Barnafo E, Friedman JF, Fried M, Duffy PE, and Kurtis JD. Identification of protective B-cell epitopes within the novel malaria vaccine candidate P. falciparum Schizont Egress Antigen-1. **Clinical and Vaccine Immunology** 2017; Jul 5; 24(7).

PMID: 28468980

13. Nixon CP, Silva-Viera RA, Nixon CE, Obeidallah SA, Jha A, Dockery D, **Raj DK**, Park S, Patrick E, Duffy PE, and Kurtis JD. Antibodies to Pfs355, A Novel Early Gametocyte Protein, Predict Decreased Plasmodium falciparum Gametocyte Density In Humans. *Journal of Infectious Diseases*, 2018 Oct 20; 218(11): 1792-1801. PMID: 29982707
14. **Raj DK**, Park S, Nixon CE, McDonald EA, Nixon CP, Pond-Tor S, Jha A, Taliano RJ, Kabyemela ER, Friedman JF, Duffy PE, Fried M, Kurtis JD, 2018. Maternally derived antibodies to Schizont Egress Antigen-1 protect offspring from severe malaria. *Clinical Infectious Diseases*. 2019 May 2;68 (10):1718-1724. PMID: 30165569

*** Equal contribution as first author**

15. Clements RL, Strelva V, Dumoulin P, Huang W, **Raj DK**, Barbara Burleigh B, Llinás M, Winzeler E, Zhang Q, and Dvorin JF, 2019. A novel antiparasitic compound kills ring-stage Plasmodium falciparum and retains activity against artemisinin-resistant parasites. *Journal of Infectious Diseases* 2019 Oct 16. PMID: 31616928.
16. **Raj DK**, Mohapatra AD, Jnawali A, Zuromski J, Jha A, Cham-Kpu G, Sherman B, Rudlaff RM, Nixon CE, Hilton N, Oleinikov AV, Chesnokov O, Merritt J, Pond-Tor S, Burns L, Jolly G, Choukri Mamoun CB, Kabyemela E, Muehlenbachs A, Lambert L, Orr-Gonzalez S, Nina F. Gnädig NF, Fidock DA, Park S, Dvorin JD, Pardi N, Weissman D, Mui BL, Tam YK, Friedman JF, Fried M, Duffy PE, Kurtis JD., Antibodies to PfGARP kill Plasmodium falciparum malaria parasites by activating programmed cell death and protect against infection and severe disease. *Nature*. 22 April 2020 (**Published**)

PATENTS

1. Su XZ, Yuan J, **Raj DK**, Pattaradilokart S, Jonshon R and Huang R. "COMPOUND THAT TREAT MALARIA AND PREVENT MALARIA TRANSMISSION" *International patent PCT/US2010/047019, Pub. No. WO/2011/025969, March, 03,2011.*
2. **Raj DK**, Pattaradilokart S, Jonshon R, Huang R, Su XZ "COMPOUND THAT TREAT MALARIA AND PREVENT MALARIA TRANSMISSION" *U.S Patent 13 392668, Pub. No. US2012/0196882A1, August, 02,2012.*
3. Kurtis J, Duffy P, Christian N, **Raj DK**, Friedman J, Fried M. "VACCINE FOR FALCIPARUM MALARIA" *U.S Patent 9662379B2, Pub. No. WO/2011/025969,May 30,2017.*

MANUSCRIPTS UNDER REVIEW

1. Michelow IC, Park S, Tsai SW, Colantuono B, Nelson S, Pasaje CFA, Early AM, Frosch AP, Ayodo G, **Raj DK**, Nixon CE, Nixon CP, Pond-Tor S, Friedman JF, Fried M, Duffy PE, Niles JC, Kurtis JD. A Novel Highly Conserved Blood-Stage Malaria Antigen on the Surface of Erythrocytes and Merozoites Induces Protective Antibodies. 2020

PRESS RELEASES

1. Rare mutation in gene of *P. falciparum* isolates identified
Published in *Medical Letter on the CDC and FDA*, June 6th, 2004
<http://www.newsrx.com/newsletters/Medical-Letter-on-the-CDC-and-FDA/2004-06-06/0606200433361DC.html>.
2. Compounds That Treat Malaria and Prevent Malaria Transmission.
<http://www.highbeam.com/doc/1P3-2287800681.html>

<http://www.ott.nih.gov/Technologies/abstractDetails.aspx?RefNo=2201>

<http://www.wellsphere.com/wellpage/thalassemia-malaria>.
3. Vaccine For Falciparum Malaria
http://scibite.com/site/library/2013_6/5/0/WO2013082500.html
4. *Plasmodium falciparum* schizont egress antigen-1 (Pfsea-1)
<http://www.nature.com/scibx/journal/v7/n25/full/scibx.2014.742.html>
5. New vaccine approach imprisons malaria parasite in blood cells
<http://www.reuters.com/article/2014/05/23/us-science-malaria-idUSKBN0E220E20140523>
6. Immune children raise hopes of malaria vaccine breakthrough.
<http://www.theguardian.com/global-development/2014/may/23/malaria-pfsea-1-vaccine-immune-children>
7. A promising protein discovery in malaria
<https://news.brown.edu/articles/2014/05/malaria>
8. NIH and NIAID Find PfSEA-1 Antigen That Protects Against Malaria.
<http://www.pharmaceuticalonline.com/doc/nih-and-niaid-find-pfsea-antigen-that-protects-against-malaria-0001>
9. **Rhode Island Hospital** Researcher and Colleagues Discover Protein That May Lead To Malaria Vaccine.
<http://www.rhodeislandhospital.org/Newsroom/News.aspx?NewsId=66566/Rhode-Island-Hospital-Researcher-and-Colleagues-Discover-Protein-That-May-Lead-To-Malaria-Vaccine/>
10. Immune children aid malaria vaccine hunt. **(BBC)**
<http://www.bbc.com/news/science-environment-27522950>
11. Has Malaria Met Its Match? **(Forbes)**
<http://www.forbes.com/sites/paulrogers/2014/05/23/has-malaria-met-its-match/>
12. Research on Malaria-Resistant Children in Tanzania Leads to Promising New Vaccine Target. (The New York Time)

http://dotearth.blogs.nytimes.com/2014/05/23/research-on-malaria-resistant-children-in-tanzania-leads-to-new-vaccine-approach/?_php=true&_type=blogs&_r=0

13. <https://www.drugtargetreview.com/news/60617/new-malaria-vaccine-candidate-shows-promise-in-non-human-primates/>

14. <https://www.sciencedaily.com/releases/2020/04/200422132930.htm>

15. <https://www.nature.com/subjects/vaccines>

16. <https://www.technologynetworks.com/biopharma/news/a-promising-new-strategy-for-combating-malaria-333894>

ABSTRACT

1. **Raj DK**, Das BR, Dash AP & Supakar *Plasmodium falciparum Pfs25* gene polymorphism in natural isolates, *6th International Symposium on Vectors & Vector Borne Diseases, Feb, 9–11, 2002, Bhubaneswar, India.*
2. **Raj DK**, Das BR, Dash AP & Supakar PC Genetic polymorphisms in MSA-1 gene of *Plasmodium falciparum* in different malaria endemic localities. *6th International Symposium on Vectors & Vector Borne Diseases, Feb, 9–11, 2002, Bhubaneswar, India.*
3. **Raj DK**, Das BR, Dash AP and Supakar PC, Detection of telomerase activity in the gametocyte of *Plasmodium falciparum*. Indo-US joint venture for development of Science, Dec. 21-22, 2003 , Bangalore, INDIA
4. **Raj DK**, Das BR, Dash AP & Supakar PC, Detection of rare point mutations in the C-terminus region of MSA-1 gene in *Plasmodium falciparum*. Malaria Symposium, Nov. 12 - 14, 2002, Delhi India.
5. Mishra S, **Raj DK**, Supakar PC, Hazra RK, Das B & Dash AP, An efficient detection of chloroquine resistance marker in pfCRT gene of *Plasmodium falciparum* from complicated malaria samples by PCR-SSCP analysis. *International Conference on Malaria: Laveran to Genomics, Nov. 4-6, 2005, New Delhi, India.*
6. **Raj DK**, Mu J, Sullivan M, Su XZ, Searching for potential vaccine candidate in the hypothetical genes of *Plasmodium falciparum* by looking at the repetitive sequence and membrane spanning domain in *Plasmodium falciparum*, *malaria meeting, March 20-21, 2006, Baltimore, USA.*
7. **Raj DK**, Mu J, Jiang H, Karat, Sullivan M, Fay MP, McCutchan TF, Su XZ, and Disruption of a putative ABC transporter alters its growth and response to anti-malarial drugs. *ASTMH meeting, Nov. 4-8, 2007, Philadelphia, PA, USA.*
8. **Raj DK**, Nixon CP, Fried M, Duffy PE, Jolly G and Kurtis JD, Identification of vaccine candidates for pediatric *falciparum* Malaria. *Lifespan 19th Hospital Research Celebration, Oct. 27, 2011, Providence, RI, USA.*

9. **Raj DK**, Nixon CP, Fried M, Duffy PE, and Kurtis JD, Vaccine Candidate Identification for pediatric falciparum malaria. **ASTMH meeting, Dec. 4-8, 2011, Philadelphia, PA, USA**
10. Yuan J, Eastman RT, Pattaradilokrat S, **Raj DK**, Cheng KCC, Johnson RL, Huang R, Liu A, Guha R, Inglese J, William TE, Austin CP and Su XZ, Chemical genomics for antimalarial drug combinations, **The Molecular Approaches to Malaria meeting Feb. 2012, 19-23, Lorne, Australia**
11. Eastman RT, Pattaradilokrat S, **Raj DK**, Dixit S, Deng B, Miura K, Yuan J, Tanaka TQ, Johnson RL, Jiang H, Huang R, Williamson K, Lambert LE, Long C, Austin CP, Wu Y and Su XZ. (2012), A Class of Tricyclic Compounds Blocking Malaria Oocyst Development and Transmission. *Genomic Epidemiology of Malaria Conference, June 10-13, 2012, Sanger Institute, Hinxton, Cambridge, UK*
12. **Dipak K. Raj**, Christian P. Nixon, Sunthorn Pond-Tor, Hai-Wei Wu, Grant Jolly, Lauren Pischel, Ailin Lu, Christina Nixon, Ian Michelow, Ling Cheng, Jennifer F. Friedman, Michal Fried, Patrick E. Duffy, Jonathan D. Kurtis., *Vaccination with Schizont Egress Antigen-1 protects mice from P. berghei ANKA challenge. ASTMH meeting, Nov.13-17, 2013 Washington, D.C., USA*
13. **Dipak K. Raj**, Christina Nixon, Sunthorn Pond-Tor, Hai-Wei Wu, Grant Jolly, Jennifer F. Friedman, Michal Fried, Patrick E. Duffy, Jonathan D. Kurtis., *Antibodies to Plasmodium falciparum glutamic acid rich protein (PfGARP) inhibit parasite growth by arresting trophozoite development. ASTMH meeting, Nov.13-17, 2013 Washington, D.C., USA*
14. **Dipak K. Raj**, Christian P. Nixon, Sunthorn Pond-Tor, Hai-Wei Wu, Grant Jolly, Lauren Pischel, Ailin Lu, Christina Nixon, Ian Michelow, Ling Cheng, Jennifer F. Friedman, Michal Fried, Patrick E. Duffy, Jonathan D. Kurtis. *Antibodies to Schizont Egress Antigen-1 (PfSEA-1) block schizont egress from falciparum infected RBCs. ASTMH meeting, Nov.13-17, 2013 Washington, D.C., USA*
15. **Dipak K. Raj**, Christian P. Nixon, Sunthorn Pond-Tor, Hai-Wei Wu, Grant Jolly, Lauren Pischel, Ailin Lu, Christina Nixon, Ian Michelow, Ling Cheng, Jennifer F. Friedman, Michal Fried, Patrick E. Duffy, Jonathan D. Kurtis. *Antibodies to Schizont Egress Antigen-1 (PfSEA-1) predict resistance to severe falciparum malaria in children. ASTMH meeting, Nov.13-17, 2013 Washington, D.C., USA*
16. Christina E. Nixon, Rute C. Silva, **Dipak K. Raj**, Christian P. Nixon, Christen DiPetrillo, Jeffrey Dvorin, Jonathan D. Kurtis. *The interactome of Schizont Egress Antigen-1, a novel vaccine candidate for falciparum malaria. Molecular and Cell Biology of Malaria, August 4-9, 2013, Lucca (Barga), Italy*
17. Christina E. Nixon, David Mulama, **Dipak K. Raj**, Sunthorn Pond-Tor, Jonathan D. Kurtis, Ann Moormann. *Cellular immune responses to a novel malaria vaccine candidate, Pf Schizont Egress Antigen-1, in young children and adults. ASTMH meeting, Nov.13-17, 2013 Washington, D.C., USA*
18. Michelow IC, **Raj DK**, Nixon CP, Nixon CE, Nelson S, Tsai, S.W., Pond-Tor S, Federick, K., Friedman JF, Fried M, Duffy PE and Kurtis JD. *Antibodies to a novel falciparum malaria antigen inhibit erythrocyte invasion. Lifespan Research Symposium 22, October 2, 2014 Providence*
19. **Raj DK**, Nixon CP, Pond-Tor S, Wu HW, Jolly G, Pischel L, Lu A, Nixon CE, Michelow I, Cheng L, Friedman JF, Fried M, Duffy PE, Kurtis JD. *Vaccination with Schizont Egress Antigen-1 protects mice from P. berghei ANKA challenge. Lifespan Research Symposium 22, October 2, 2014 Providence*

20. **Raj DK**, Nixon CP, Pond-Tor S, Wu HW, Jolly G, Friedman JF, Fried M, Duffy PE, Kurtis JD., *Antibodies to Plasmodium falciparum glutamic acid rich protein (PfGARP) inhibit parasite growth by arresting trophozoite development. Lifespan Research Symposium 22, October 2, 2014 Providence*
21. Ian C. Michelow, **Dipak K. Raj**, Christina Nixon, Christian P. Nixon, Sara Nelson, Sunthorn Pond-Tor, Joanna Glanz, Kai Fricke, Jennifer Friedman, Michal Fried Patrick E. Duffy, Jonathan D. Kurtis., Antibodies to a hypothetical falciparum malaria antigen (PF3D7_1134300) inhibit erythrocyte invasion **ASTMH meeting, Nov.2-6, 2014, Washington, D.C., USA**
22. **Dipak K. Raj**, Brett Sherman, Jeffrey D. Dvorin, Sunthorn Pond-Tor, Patrick E. Duffy, Jonathan D. Kurtis, Identification and characterization of a novel antigen PfCDPK-5 for the development of pediatric malaria vaccine. **International Journal of Infectious Diseases**, Volume 45, Supplement 1, April 2016, Pages 424–425/ ICIID abstract supplement 2016
23. **Dipak K. Raj**, Christina Nixon, Sunthorn Pond-Tor, Hai-Wei Wu, Grant Jolly, Jennifer F. Friedman, Michal Fried, Patrick E. Duffy, Jonathan D. Kurtis, Analysis of *Plasmodium falciparum* glutamic acid rich protein (PfGARP) as potential pediatric malaria vaccine. **International Journal of Infectious Diseases**, Volume 45, Supplement 1, April 2016, Pages 377/ ICIID abstract supplement 2016
24. Friedman JF, Michelow I, Park S, Raj DK, Nixon CE, McDonald EA, Nixon CP, Pond-Tor S, Jha A, Kabyemela E, Fried M, Duffy PE and **Kurtis JD**. Cord blood anti-pfsea-1 and protection from severe malaria in infants. In: Am. J. Trop. Med. Hyg. AMER SOC TROP MED & HYGIENE 8000 WESTPARK DR, STE 130, MCLEAN, VA 22101 USA, 2017
25. Michelow IC, Tsai S-W, Nelson S, Park S, Raj DK, Nixon CP, Nixon CE, Pond-Tor S, Friedman JF, Fried M, Duffy PE and **Kurtis JD**. A novel blood-stage vaccine candidate mediates protection against falciparum malaria in mice and children. In: Am. J. Trop. Med. Hyg. AMER SOC TROP MED & HYGIENE 8000 WESTPARK DR, STE 130, MCLEAN, VA 22101 USA, 2017
26. Jnawali A, Mohapatra DA, Kurtis, **Raj DK**. The adaptive immune response in BALB/c mice following vaccination with recombinant Plasmodium falciparum-glutamic acid-rich protein (PfGARP) **NIH IDeA Symposium**, June 8, 2018
27. **Raj DK**, Mohapatra AD, Janiwali A, Jha A, Sherman B, Pardi N, Weissman D, Nixon CE, Dvorin JD, Rudlaff R, Pond-Tor S, Jolly G, Muehlenbachs A, Kabyemela E, Lambert L, Gonzalez SO, Oleinikov A, Park S, Friedman JF, Fried M, Duffy PE, Kurtis JD. Antibodies to Plasmodium falciparum glutamic acid rich protein (PfGARP) protect against infection and severe disease. Event: **Molecular Parasitology Meeting, Woods hole, 2018 Sep, 09 -13/18 USA.**
28. **Raj DK**, Mohapatra AD, Janiwali A, Nixon CE, Dvorin JD , Rudlaff R, Pond-Tor S, Jolly J, Lambert L , Gonzalez SO , Rausch K, Park S, Pardi N, Weissman D, Friedman JF, Fried M, Duffy PE, Kurtis JD. Antibodies to PfGARP protect against Plasmodium falciparum infection and severe disease. **Gordon Research Conference, Switzerland, June, 30- July 5, 2019**
29. **Raj DK**, Sherman B, Jha A, Duffy PE, Jonathan D. Kurtis. Evaluation of a novel antigen PfCDPK-5 as a pediatric malaria vaccine. **NERIC 2019, Aug 14-16, 2019, New Hampshire, USA**
30. **Raj DK**, Jha A, Sherman B, Jnawali A, Gerald CK, Kurtis JD. Identification and characterization of a novel antigen PfCDPK5 as a pediatric malaria vaccine. **ASTMH meeting, Nov.20-24, 2019, National Harbor, Maryland USA**

PRESENTATIONS IN CONFERENCES

6th International Symposium on Vectors & Vector Borne Diseases	Regional Medical Research Centre, India. 2002 Title- <i>Plasmodium falciparum</i> Pfs25 gene polymorphism in natural isolates
6th International Symposium on Vectors & Vector Borne Diseases	Regional Medical Research Centre, India. 2002. Title- Genetic polymorphisms in MSA-1 gene of <i>Plasmodium falciparum</i> in different malaria endemic localities
Indo-US joint venture for development of Science	Bengaluru, India, 2003. Title- Detection of telomerase activity in the gametocyte of <i>Plasmodium falciparum</i>
International symposium on malaria	Malaria Research Centre, New Delhi, India, 2004. Title- Detection of rare point mutations in the C-terminus region of MSA-1 gene in <i>Plasmodium falciparum</i> .
Research Seminar Series	Utkal University, India. 2005 Title-Polymorphism in <i>P. falciparum</i> malaria vaccine candidate genes.
Malaria Seminar Series	John Hopkins university, MD, 2007. Title: PfMRP gene and drug resistance in malaria.
Young Investigator Award	Lifespan, RI, 2011, Title- PfSEP-1, a novel vaccine candidate for falciparum malaria”
Young Investigator Award	Lifespan, RI, 2012, Title- PfGARP, a novel pediatric vaccine candidate for falciparum malaria”
Pediatric research colloquium	Woman and Infant Hospital, RI, 2013. Title- PfSEA-1, a novel vaccine candidate for pediatric falciparum malaria”
Pediatric research colloquium	Woman and Infant Hospital, RI, 2013. Title- Antibodies to Plasmodium falciparum glutamic acid rich protein (PfGARP) inhibit parasite growth by arresting trophozoite development
Institute of Life Sciences	Vaccine development against pediatric malaria
ASTMH Annual meeting	
Gordon Conference for malaria, 2019	

GRANTS

Current Research Support

1) **R01 AI144014-01A1** Raj (PI) 12/13/2019-11/30/2024
Multi-target blood stage vaccine against Plasmodium

Role: Principal Investigator

2) **R21 AI131047-01A1** Raj (PI) 02/1/2018-07/1/2020
PfCDPK5 based vaccines for pediatric malaria

Role: Principal Investigator

2) **R01 5R01AI076353** Kurtis (PI) 09/2014-09/2020
"PfSEA-1 based vaccines for *falciparum* malaria"

Role: Co-investigator; I participated in experiment design, implementation and data interpretation. The major goal of this work was to further develop vaccine candidates PfSEA-1 for human trial using animal models and human usable adjuvants. I participated in design and execution of experiments; conduct parasite challenge study in animals including primate models, implementation of protocols, data interpretation and manuscript Preparation.

Pending Research Support

NIH/NIAID R01 "Particle-Based Vaccines for Falciparum Malaria" 2019-2024. Total Costs **\$5,579,034**. Dr. Raj is the Co-PI at 30% effort.

NIH/NIAID R01 "Vaccine Antigen Discovery for Falciparum Malaria" 2019-2024. Total Costs **\$4,574,962**. Dr. Raj is the Co-PI at 30% effort.

NIH/NIAID R21 "Lambda-Particle based Malaria Vaccine" 2020-2021. Total Costs **\$275,000**. Dr. Raj is the PI at 40% effort.

Completed Research Support

1) Oh-Zopfi Project Grant 01/2018-11/2019

Women & Infants Hospital
Preliminary evaluation of newly identified malaria antigens
\$22,500 annual direct costs

Role: Principal Investigator

2) Rhode Island Foundation 2017- 2018
"Evaluation of vaccine potential for five malaria antigens identified in disease-resistant children"

The goals of this study are to investigate the vaccine potential of five newly identified gene.
\$25,000 annual direct costs

Role: Principal Investigator

3) COBRE Pilot Project
P20GM1043-12 2015- 2016
Evaluation of PfCDPK-5 as pediatric malaria vaccine
\$80,000 annual direct costs
Role: Principal Investigator

4) NIH/National Institutes of Allergy and Infectious Diseases 09/2008-08/2012
1R01AI076353 2008-2012, Kurtis (PI)
\$378,274 annual direct costs
\$166,828 annual indirect costs
Role: Research Associate
“Targeted Vaccine Development for Pediatric Falciparum Malaria”
The major goal of this work was to identify vaccine candidates for pediatric falciparum malaria using an immuno-epidemiologic approach; I participated in experiment design, implementation, data interpretation and manuscript Preparation.

5) University Grant commission, Govt. of India, Scholarship **Raj (PI)** 2003
“Genetic polymorphism in MSA-1 gene of plasmodium falciparum”.
Role: Principal Investigator

6) Department of Biotechnology Govt. of India Fellowship **Raj (PI)** 2004
“Molecular detection of malaria and filarial parasite in human blood.”.
Role: Principal Investigator

MENTORING EXPERIENCE:

Dr. Raj has supervised the independent senior thesis work of undergraduate and Master students. Three of these individuals are from Brown university sponsored UTRA awards.

Student and Institution	Year	Title of project
Sasmita Mishra (DBT, Govt. of India)	2003	Single nucleotide polymorphism in drug resistant genes of malaria parasite, <i>Plasmodium falciparum</i> .
Veronica S Wright National Institute of Health, USA)	2008-2010	Gene knockout and analysis of drug resistance genes in malaria parasite <i>Plasmodium falciparum</i> .
Camia Crawford (Brown Medical School, USA)	2010	Detection and analysis of malaria specific antibodies in kids serum collected from Moherza Tanzania.
Lauren Pischel (Brown University, USA)	2010-2011	Heterogeneity in PfSEA-1 sequences from field isolates-implication for vaccine development.
Marie Siwicki (Brown University, USA)	2010-2011	Growth inhibition antibodies targeting PfSEP-1 (Brown University).
Alini Lu (College of Human Ecology NY, USA)	2011-2012	Use of T7 phase display techniques for identification of potential vaccine candidate for pediatric malaria.

Nick Rich New York University, USA)	2013	Cloning and recombinant protein expression of a potential vaccine candidate, Pf-GARP for pediatric malaria.
Hadly Witt (Brown University, USA)	2014-2016	Optimization and adjuvant formulations of PfSEA-1 based vaccines and identification of RBC invasion ligands in murine challenge models
Brett Sherman (Brown University, USA)	2015-2017	Phenotyping of genetically altered potential malaria vaccine candidate gene, Pf-GARP
Shreya Ramyya (Brown University, USA)	2016-2018	Evaluation of PfCDPK-5 as pediatric malaria vaccine
Ambrish Jha (Medical Graduate, Nepal)	2016-2017	Optimization of Schizont Egress Antigen-1 (PfSEA-1) and adjuvant combination against P. Berghei ANKA challenge in mice.
Andrea Rodriguez (Brown University)	2017-2018	"Identification of Novel Vaccine Candidates against pediatric malaria".
Anup Janiwali (Medical Graduate, Nepal)	2017-2019	PfGARP as pediatric malaria vaccine
Karan Modi (Brown University)	2018-2019	Evaluation of PfCDPK-5 as pediatric malaria vaccine