Mulaka Maruthi, Ph.D.

Assistant Professor,

Department of Biochemistry,

School of Interdisciplinary and Applied Life Sciences,

Central University of Haryana, Mahendergarh,

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Areas of interest

•*Plasmodium* and *Toxoplasma* parasite biology •Host pathogen interactions •Cerebral malaria •Mitochondrial Physiology •Epigenetic modifications

Research Experience

Postdoctoral Fellow: 2016-2017, National Centre for Biological sciences, Bangalore

Postdoctoral Researcher: 2018-2020, Institute of Molecular Medicine and Infectious diseases, Drexel University college of Medicine, USA

Education

- **Doctor of Philosophy.** 2016, Animal Sciences,

Department of Animal Biology, University of Hyderabad, Hyderabad, India

Thesis: "Modulation of host cell SUMOylation facilitates efficient development of *Plasmodium berghei* and *Toxoplasma gondii* & Functional characterization of *Plasmodium berghei* proteasome inhibitor (PI31) through reverse genetics approach"

- **Master of Science,** 2008, Biochemistry and Molecular Biology,

Department of Biochemistry and Molecular Biology, Pondicherry University, Pondicherry, India.

- **Bachelor of Science,** 2006, Biochemistry, Zoology, Chemistry

Government Degree College, Sri Krishnadevaraya University, Anantapur, India

Publications

•Mulaka Maruthi**;** Dipti Singh; SegireddyRameswara Reddy; Babu S Mastan; Satish K Mishra; Kota Arun Kumar. Modulation of host cell SUMOylation facilitates efficient infection of *Plasmodium berghei* and *Toxoplasma gondii***. Cellular Microbiology, 2017**, DOI: 10.1111/cmi.12723

•Togiri J, Segireddy RR, Mastan BS, Singh D, Kolli SK, Ghosh A, Al-Nihmi FMA, Maruthi M, Choudhary HH, Dey S, Mishra S, Kumar KA. Plasmodium berghei sporozoite specific genes-

PbS10 and PbS23/SSP3 are required for the development of exo-erythrocytic forms. **Mol Biochem Parasitol, 2019**

- Abhijit Deshmukh; Pallabi Mitra; Mulaka Maruthi. Cdk7 mediates RPB1-driven mRNA synthesis in *Toxoplasma gondii*. **Scientific Reports, 2016**, DOI: 10.1038/srep35288
- Faisal Mohammed Abdul Al-Nihmi; Mastan Babu Somepalli; JyothiTogiri; Rameswara Reddy Segireddy; Surendra Kumar Kolli; Maruthi Mulaka; Roshni Gupta; Puran Sijwali; Satish Mishra; Kota Arun Kumar. A Novel and Conserved Plasmodium Sporozoite Membrane Protein SPELD is required for Maturation of Exo-erythrocytic Forms. **Scientific Reports, 2016**, DOI: 10.1038/srep40407
- Anand, Sripada; Maruthi, Mulaka; Babu, Phanithi. The specific, reversible JNK inhibitor SP600125 improves survivability and attenuates neuronal cell death in experimental cerebral malaria (ECM). **Parasitology Research**. **2013**, Vol. 112, Issue 5, p1959-1966. 8p. DOI: 10.1007/s00436-013-3352-0.
- Maruthi Mulaka, Liqin Ling, Hangjun Ke. A dispensable role of mitochondrial fission factor 1 (Fis1) in the erythrocytic development of *Plasmodium falciparum.* (Under communication)
- Liqin Ling *, Maruthi Mulaka *, Swati Dass, Michael W. Mather, Michael K. Riscoe, Jing Zhou, Hangjun Ke. Genetic ablation of the mitochondrial ribosome in Plasmodium falciparum sensitizes the human malaria parasite to antimalarial drugs targeting mitochondrial functions (*Contributed equally) (**Under review, JBC**)
- Design and Targets Elucidation of Inhibitors at Multiple Protein-Membrane Interfaces Generate Extremely Potent Antimalarials. Yang, Yiqing; Huang, Zhenghui; Li, Xiaolu; Michel, Thomas; Ling, Liqin; Tang, Tongke; Mulaka, Maruthi; Wu, Yue; Gao, Hongying; Wang, Liguo; Zhou, Jing; Meunier, Brigitte; Ke, Hangjun; Jiang, Lubin; Rao, Yu. (Under communication)
- Mulaka Maruthi**;** Deepak Kumar; Segireddy Rameswar Reddy; Dipti Singh; Kota Arun Kumar. Functional characterization of proteasome inhibitor 31 (PI31) in *Plasmodium berghei* by reverse genetics approach. (Under communication)
- Segireddy Rameswara Reddy; Mulaka Maruthi**;** Dipti Singh; Divya Gupta; Satish Mishra; Kota Arun Kumar. Expression profiling of host long non-coding RNAs during *Plasmodium* and *Toxoplasma* infection. (Under communication)

Research Expertise

- **Parasitology:** Maintenance and infection of *Plasmodium falciparum*, *Plasmodium berghei* and *Toxoplasma gondii*. Generation of transgenic *Toxoplasma* and *P. falciparum and P. berghei* parasite lines and their characterization both in *ex vivo* and *in vivo* model systems. Maintaining parasite cycles from sporozoites and tachyzoites, determination of parasite load in liver of infected mice and cell lines by fluorescence microscopy and Real Time PCR, sporozoite gliding motility assay, sporozoites traversal and invasion assay. Maintenance and processing of *in vitro* EEF cultures of *P. berghei*.

- **Biochemistry:** Drug activity studies using parasite cultures, mitochondrial function assays, enzymology, Immuno-blotting, Immuno Precipitation, ELISA, *in vitro* phosphorylation.
- **Molecular Biology:** Molecular cloning, conditional gene expression/knockdown, RNAi silencing, CRISPR/Cas9 based gene manipulation, protein expression and purification, DNA/RNA/protein isolation and analysis.
- **Entamology:** Breeding and maintenance of *Anopheles* mosquito colony. Infection cycle with rodent and human malaria parasites, microinjection of mosquitoes.
- **Animal handling:** Handling of Mouse, rat and rabbit for infection and immunological studies. All modes of injection, blood collection and organ isolation, generating polyclonal antibodies, mouse model of cerebral malaria.
- **Microscopy:** Fluorescence and confocal microscopy, Cryo-sectioning, vibratome sectioning, IFA, IHC of thin and thick sections, Image analysis (ImageJ and Cell profiler).
- **Animal cell culture:** Maintenance of mammalian cells and manipulation, infection studies, generating stable cell lines, stem cell isolation and culture, organoid engineering.

Awards and Fellowships

- Inspire Faculty Award (2018), Department of Science and Technology (DST), India
- Senior Research Fellowship (2011-2014), CSIR, India
- Junior Research Fellowship (2009-2011), CSIR, India

Conference Presentations and Workshops

- Molecular Parasitology Meeting 2019, Woodshole, USA. Interactions between ribosomal proteins and fragmented rRNAs in the mitochondrial ribosome of *Plasmodium falciparum*
- Pennsylvania Parasitology conference (PARaCon) 2019, Penn State University, USA.
- Molecular Parasitology Meeting 2018, Woodshole, USA. Elucidating the mechanism of mitochondrial fission in *Plasmodium falciparum*
- Pennsylvania Parasitology conference (PARaCon) 2018, Penn State University, USA.
- Malaria Parasite Biology: Strategies for drug and vaccine development 2017, ICGEB, New Delhi
- Meeting on cell biology of infections 2016, NCBS, Bangalore, India. Modulation of SUMOylation facilitates efficient development of *Plasmodium* and *Toxoplasma*.
- International Scientific meeting: Recent Developments in Malaria Parasite Biology 2013, ICGEB, New Delhi
- National Fluorescence Workshop, FCS-2013. Indian Institute of Science (IISc).