

MERA-India brings you...

# NEWS & VIEWS

Issue 23, September 2022

## INTERVIEW



**Dr Ruchi Singh,**  
Scientist F,  
ICMR–National Institute of  
Pathology,  
New Delhi, India

## UPCOMING EVENT



*Distinguished Lecture by*  
**Dr Raman Velayudhan**  
Unit Head, VVE/UCN/NTD,  
WHO, Geneva, Switzerland  
*12<sup>th</sup> October | 3:00 PM IST*

## ANNOUNCEMENTS

**Basic Mosquito  
Biology Training**

**MERA-India  
Image Competition**

Editorial | NIMR & MERA-India activities | Research in Spotlight | Interview  
Resource for Malaria Researchers: InterPro | A Child's Perception of Malaria  
Upcoming Events | Announcements

## Editorial

Dear Readers,

MERA-India team brings you the twenty-third issue of our newsletter “News & Views’.

As the monsoon season continues, the reign of mosquitoes prevails. Mosquitoes are among the most dangerous creatures taking millions of lives around the globe. Even when not killing, they can still make people seriously ill and nauseous, disturbing individual economic status and, in a broader sense the country’s economy. These mischievous creatures can host various viruses and protozoans, transmit them to humans and cause diseases like dengue, chikungunya, zika, yellow fever, and malaria. But not all mosquitoes can transmit diseases. Among 3,500 known mosquito species, major disease-causing mosquitoes belong to *Aedes*, *Culex*, and *Anopheles* genera. *Aedes* transmit diseases like dengue, zika, encephalitis, and yellow fever; *Culex* transmits West Nile fever, Japanese encephalitis, and St. Louis encephalitis; and *Anopheles* transmit malaria. *Aedes* usually bite during day time whereas *Culex* and *Anopheles* in late evening or night. Hence, people are under mosquito’s radar around the clock.

Keeping in mind that monsoon triggers these transmissible diseases by promoting mosquito proliferation, we should implicate measures to restrict the population of these dangerous organisms. To do so, we could focus on two strategies, eliminating the breeding sites and reducing mosquito-human contact. *Culex* and *Anopheles* breed in polluted stagnant water, whereas *Aedes* in fresh water. Even an inch of water can facilitate mosquito breeding. Therefore, it is important to regularly monitor and eliminate possible sites having stagnant water. Water in bird feeders, planters, coolers etc. should be changed weekly. To avoid mosquito-human contact, people should wear long sleeves, light-colored clothes, and apply repellents while going outside. Sleeping under bed nets and using appropriate protective measures will help a lot. Although government and public health workers are doing their bit, by following protective measures at the individual level, we can together save the community from these deadly insects.

MERA-India is also doing its bit and continuously working to support the research towards the elimination of one of the deadly vector-borne diseases transmitted by *Anopheles* mosquitoes i.e., malaria. This monthly newsletter is one of the initiatives of MERA-India, to encourage the readers with inspirational interviews of esteemed researchers, and to make them aware of the latest research, announcements, and useful resources in the field of malaria.

In the current edition, you will find the summary of the distinguished lecture by Dr Subhash Salunke (Advisor to Hon'ble Minister of Health and Family Welfare, Government of Maharashtra), where Dr Salunke enlightened the public health terminologies and discussed the ways of disease elimination through his immense experience. Highlights from training in qualitative research conducted at ICMR-NIMR, have also been provided in this issue. An intriguing interview of Dr Ruchi Singh, Scientist F, at ICMR-National Institute of Pathology, is presented in this edition.

In the “Research in spotlight” section, we have showcased the three latest articles describing the differences between the *Plasmodium falciparum* and *P. vivax* lineages; the views of policymakers and malariologists on the importance of community engagement for malaria elimination, and the effect of seasonal variations in parasite adaptations and its contribution to malaria transmission.

In the section “A Child’s Perception of Malaria”, we have yet again featured an elegant sketch by a talented child artist displaying her understanding of Malaria.

To spread awareness about entomology and encourage young researchers to pursue this field, MERA-India is organizing a “Basic Mosquito Biology Training” for Ph.D. students on 18<sup>th</sup> October 2022 at ICMR-NIMR, New Delhi. To highlight the impact and significance of images in research, MERA-India is organizing an “Image Competition” for PhD/MD students and postdocs across India. Original images or photographs related to malaria research are invited to this competition. Details are provided in the “Announcements” section.

We hope that this issue will be more engaging and fascinating for you. Please write to us for any feedback or suggestions regarding the newsletter’s content at [meranewsletter@gmail.com](mailto:meranewsletter@gmail.com).

With best wishes,  
MERA-India team

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## ICMR-NIMR & MERA-India Activities

### Distinguished Lecture by Dr Subhash Salunke



Dr Subhash Salunke, Advisor to Hon'ble Minister of Health and Family Welfare, Government of Maharashtra, India, visited ICMR-NIMR in September 2022 to deliver a lecture in the ICMR-NIMR & MERA-India “Distinguished Lecture Series”. Dr Salunke has formerly served as the Director-General of Health Services, Maharashtra, and has over 30 years of experience in public health. Dr Manju Rahi, Director-in-Charge, ICMR-NIMR, welcomed Dr Kumar to NIMR, and Dr Sachin Sharma, Chief Consultant, MERA-India, introduced the speaker to the attendees.

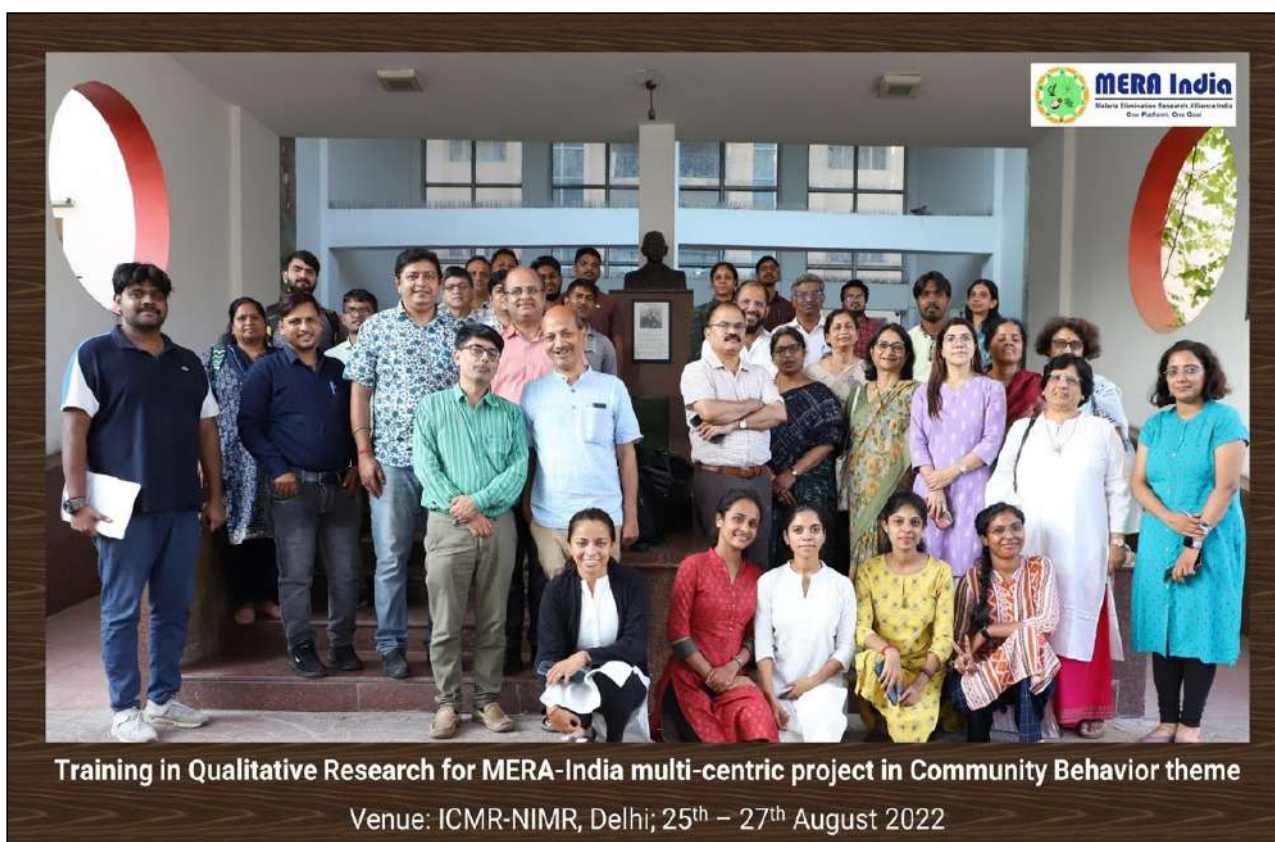
Dr Salunke's lecture was entitled “Public health capacity building to reach the goal of elimination of diseases”. In this insightful lecture, he shared his perception and experience about building public health capacity for disease elimination, with examples from the public health challenges. He stressed upon the importance of interaction and collaboration between the public health administrators, policymakers, programme implementers, and research institutions to work on identifying the strengths of each and enhancing them through capacity building for meeting challenges. He further described the control, elimination, and eradication phases concerning diseases, and highlighted India's current targets for disease elimination. He explained the importance of capacity building for meeting disease elimination targets and elaborated on the several factors contributing to the success of disease elimination programmes, including diagnostic, surveillance, interventions and health system capacities, political commitment and leadership, sustenance of efforts and community participation.

The lecture was followed by an interaction between Dr Salunke and the NIMR scientists. Dr Salunke also answered questions from the online lecture attendees. The session concluded with Dr Manju Rahi and Dr Sachin Sharma thanking the speaker and the attendees.

The recording of this lecture is available on the MERA-India website (<https://www.meraindia.org.in/lecture-series>).

## Training in Qualitative Research for MERA-India multi-centric project on Community Behavior theme

In August 2022, MERA-India organized training in Qualitative Research at ICMR-NIMR, for the MERA-India funded multi-centric project in the Community Behavior theme. The training was conducted under the guidance of the experts Dr Bontha V. Babu (Scientist-G and Head of Socio-Behavioral & Health Systems Research Division, ICMR, New Delhi), Prof Rajib Dasgupta (Chairperson, Centre of Social Medicine & Community Health, JNU, New Delhi), Professor Madhumita Dobe (Former Dean, Director-Professor and Head of the Department of Health Promotion and Education, AllHPH), Professor Y.S. Kusuma (Centre for Community Medicine, AIIMS, New Delhi), Dr Amit Sharma, (former Director, ICMR-National Institute of Malaria Research) and Dr Manju Rahi (Director-in-charge, ICMR-National Institute of Malaria Research).



During the training, there were lectures from the experts about the significance, characteristics, methodology, approaches, data management & analysis of qualitative research to understand the perceptions, patterns & reasons for specific behavior by individuals or communities concerning health and disease.



Field activities to carry out qualitative research using focussed group discussions (FGDs), key-informant interviews (KIIs), and in-depth interviews (IDIs) were also conducted under the guidance of the experts.



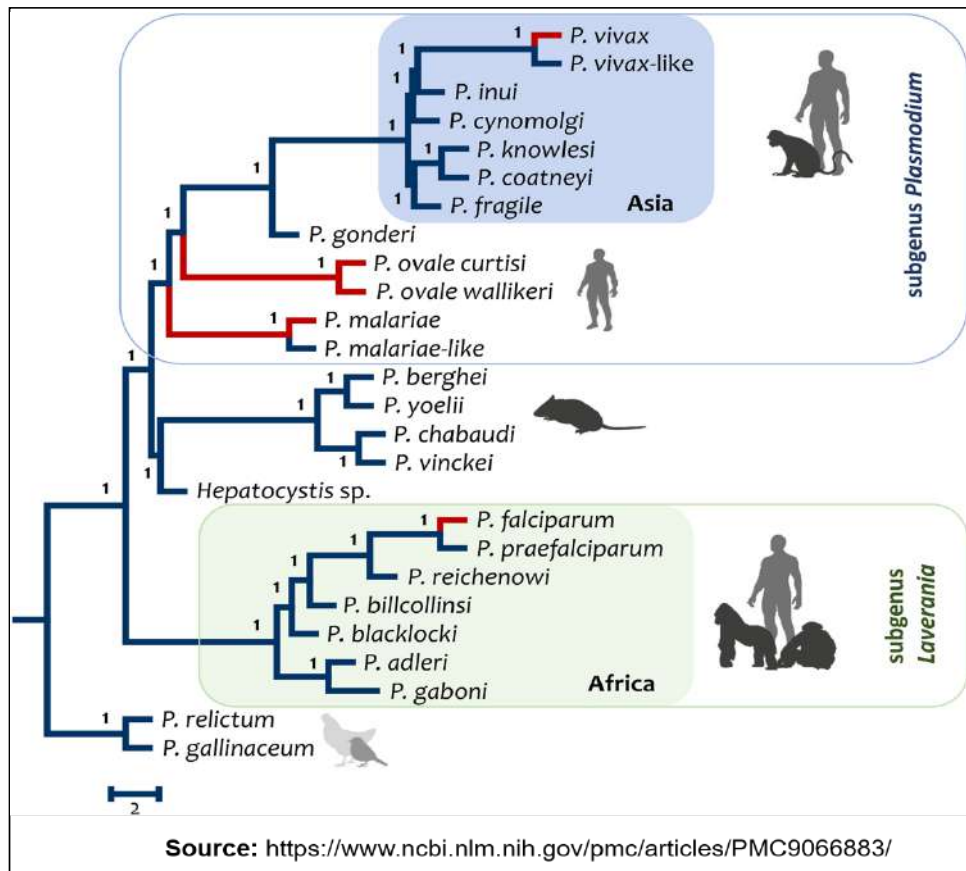


This highly interactive training was attended by the Principal Investigators and their project teams from institutions across India running the MERA-India funded multi-centric project to assess community behaviour in relation to malaria prevention and control.

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## Research in Spotlight

### Escalante AA. et al., *Malar J.* 2022: Why *Plasmodium vivax* and *Plasmodium falciparum* are so different? A tale of two clades and their species diversities

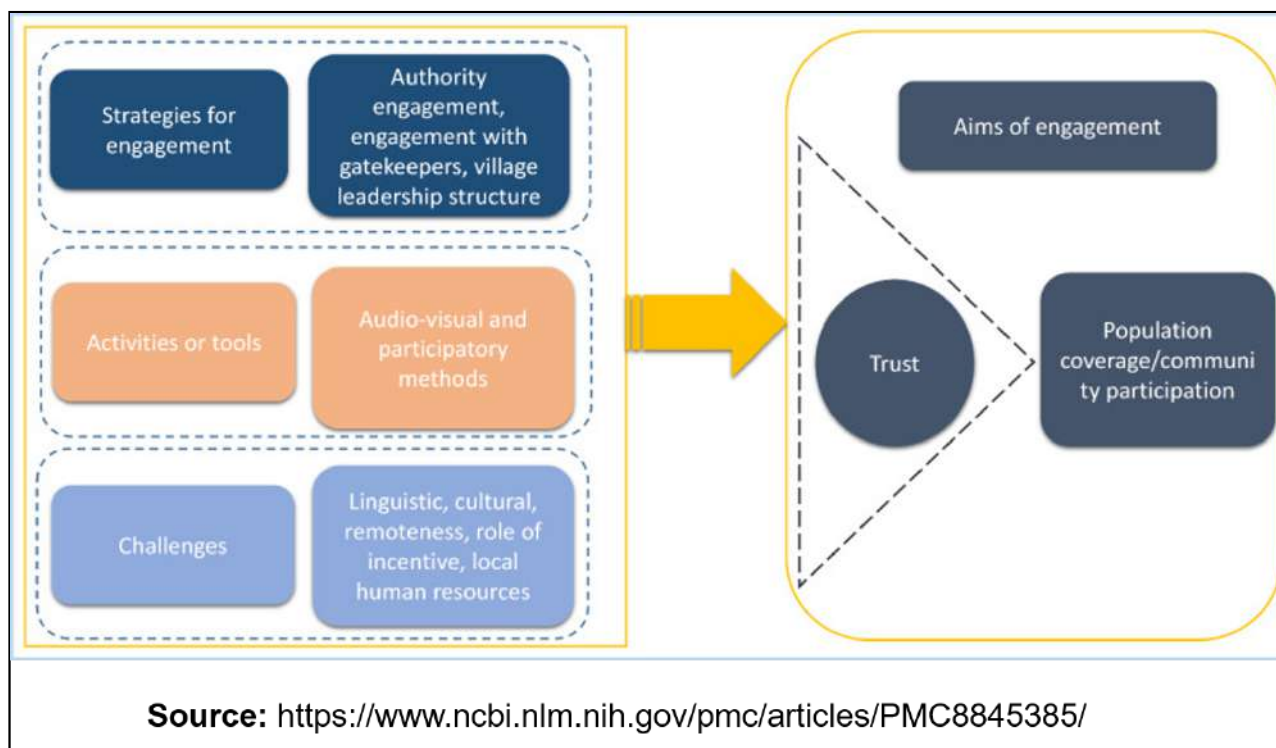


There are around 200 known species of *Plasmodium* that can infect various primates and non-primates. Among them, five can cause malaria in humans (independent of zoonotic spillover): *Plasmodium vivax*, *P. falciparum*, *P. ovale curtisi*, *P. ovale wallikeri*, and *P. malariae*. All these spp. belong to different lineages or clades which eventually emerged from the common ancestors.

In the present [article](#), the authors have described the phylogenetic relationship of the known primate malaria-causing *Plasmodium* spp. with respect to their whole mitochondrial and nuclear genomes and inferred their possible origin and cause of their diversification. The authors have shown that all of the parasites causing malaria in human falls in the subgenus *Plasmodium* except for the fatal *P. falciparum*, which belongs to the subgenus *Laverania*. Both the clades belong to the monophyletic group having African origin. This study shows that the subgenus *Laverania* (sharing avian parasite characteristics) has lost the characteristics of the common ancestors of avian and primate parasites, which further persisted in the primate parasites. The authors have suggested that, as the genus *Plasmodium* is paraphyletic, further understanding of the non-*Plasmodium* subgenus can illustrate the evolution of malaria parasites.

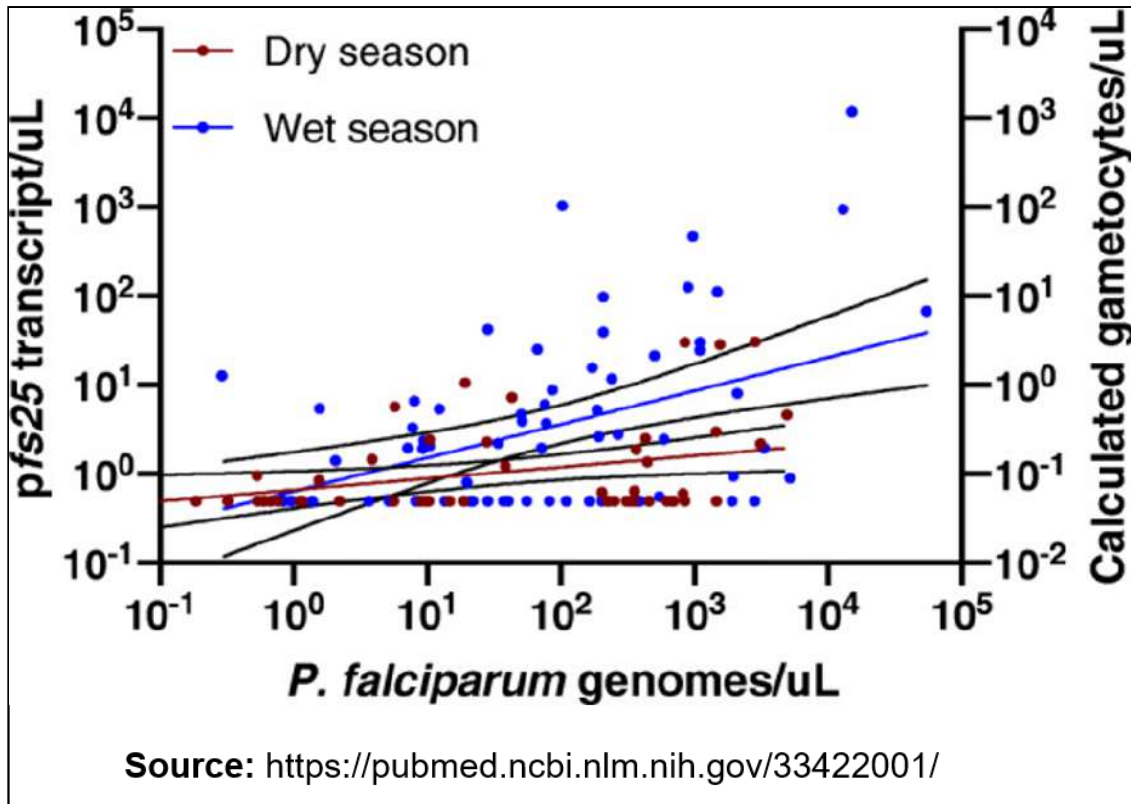


## Kaehler N. et al., Malar J., 2022: Community engagement for malaria elimination in the Greater Mekong Sub-region: a qualitative study among malaria researchers and policymakers



Community engagement and participation are essential components for the success of any intervention and for achieving the elimination of any disease. In this qualitative research [study](#), the authors explore the role of community engagement in malaria control and elimination from the perspective of the policy-makers and researchers working in the Greater Mekong Sub-region (GMS). The authors conducted a total of 32 semi-structured interviews, between October 2016 and April 2017, with 17 policy-makers and 15 leading malariologists identified based on their expertise or roles in malaria programmes in the GMS. The interviews covered topics such as mass drug administration (MDA) and community engagement in malaria elimination. The findings from the study integrated the responses from the policy-makers and the researchers under the themes describing the aims, strategies, tools, and challenges for community engagement. Both, the researchers and the policy-makers, felt that building trust was an important factor in ensuring and promoting effective community engagement. The barriers such as geographical remoteness, socio-cultural and linguistic factors could be overcome by engaging local community members. The study highlights the need for sustained investment in community engagement to achieve the last mile of malaria elimination, especially by reaching hard-to-reach and remote areas.

**Oduma CO. et al., BMC Infect. Dis., 2021: Increased investment in gametocytes in asymptomatic *Plasmodium falciparum* infections in the wet season**



Transmission of disease from asymptomatic malaria infections poses a major threat to approaches for malaria elimination. Previous studies indicated that seasonal variations and vector density impact malaria transmission in endemic areas. In this [article](#), the authors determined the effect of seasonal changes on gametocyte densities in asymptomatic infections and its contribution to malaria transmission. The blood samples from asymptomatic persons were tested for asexual parasite densities by quantitative PCR, and for gametocyte density by quantitative RT-PCR. The results demonstrated a high prevalence of malaria parasites in the wet season in Chulaimbo (a region with moderate transmission intensity); however, no significant differences in prevalence were noticed between seasons in the low transmission study site. It was found that in the wet season, there are lesser infections that carry detectable gametocytes, but gametocyte densities, as determined by pfs25 expression, were observed to be higher as compared to the dry season though parasite densities did not vary much between seasons. This further suggests that parasites invest more in gametocyte form during the period of high transmission, which coincides with vector abundance in the wet season. A better understanding of the effect of seasonal variations on parasite adaptations to boost its transmission potential would help develop effective malaria control measures.

## Malaria Scientist to Watch: An interview with Dr Ruchi Singh



### [Dr Ruchi Singh](#)

Scientist F,  
ICMR – National Institute of Pathology,  
New Delhi, India

*1. Please share with our readers your journey from being a young scientist to your current position as Scientist - F at ICMR-National Institute of Pathology.*

I commenced as a CSIR-JRF at the Institute of Pathology and worked on kala-azar and post-kala-azar dermal leishmaniasis in 2001. In 2006, as UNESCO L'Oréal for Women in Science fellow, I continued my post-doctoral research in the Centre for Biologics Research, Food and Drug Administration, USA, where I explored the antimony resistance mechanisms in *Leishmania*. In 2007, I got the opportunity to join ICMR-National Institute of Malaria Research as a Senior Research Officer and continued working there till 2011. In 2012, I joined the ICMR-National Institute of Pathology as Scientist D and continued research on *Leishmania* and malaria parasites. For the last 21 years, my research has focused on genomics, diagnostics, and mechanisms of drug resistance in Visceral Leishmaniasis (VL), Post Kala-azar Dermal Leishmaniasis (PKDL), and malaria. I established novel molecular tests for non-invasive diagnosis of malaria and the *Leishmania* parasite detection in PKDL. A rapid molecular point of care test developed by our laboratory was transferred to the industry to produce an affordable molecular diagnosis for kala-azar and PKDL. Recently, we initiated research studies on bacterial antimicrobial resistance to establish the resistance mechanism in the circulating population of *Acinetobacter baumannii* and *Klebsiella pneumonia*.

*2. The low-density and asymptomatic infections pose a major obstacle to breaking the transmission chain of infectious diseases like malaria. In your opinion, how can we overcome this problem?*

Any undetected/misdiagnosed and untreated/improperly treated malaria infection may pose an obstacle to breaking the malaria transmission. However, low-density and asymptomatic infections remain undetected and subsequently untreated, contributing significantly to malaria transmission. Thus, active surveillance for these types of infections in the field is the need of the moment to overcome this problem. New cost-effective molecular diagnostic tools may be applied in the field in addition to existing RDT and microscopy. At this juncture of malaria elimination in the country, the proportion of such asymptomatic malaria infections with sub-microscopic and RDT-negative status must be estimated at multiple sites representing varied malaria endemicity.

*3. India has set up a target of malaria elimination by 2030 and has been seeing a decline in the number of cases and deaths. What challenges do you see for India in achieving this goal?*

Malaria elimination in our country is going at an incredible pace. In the absence of the emergence of antimalarial resistance by parasite and insecticide resistance by malaria vectors, the efforts towards elimination seem immaculate. However, continuous surveillance of antimalarial and insecticide resistance could be a difficult task to manage in a vast and geographically diverse country like India. Migration from high-endemic areas to low-endemic regions may challenge malaria elimination. The major challenge is to properly detect and treat each and every *Plasmodium vivax* malaria infection in the country. In addition, the surveillance of pfrhp-2,3 gene deletion and the asymptomatic reservoir is a ground-level challenge toward malaria elimination by 2030.

*4. What challenges do you see for women working in STEM?*

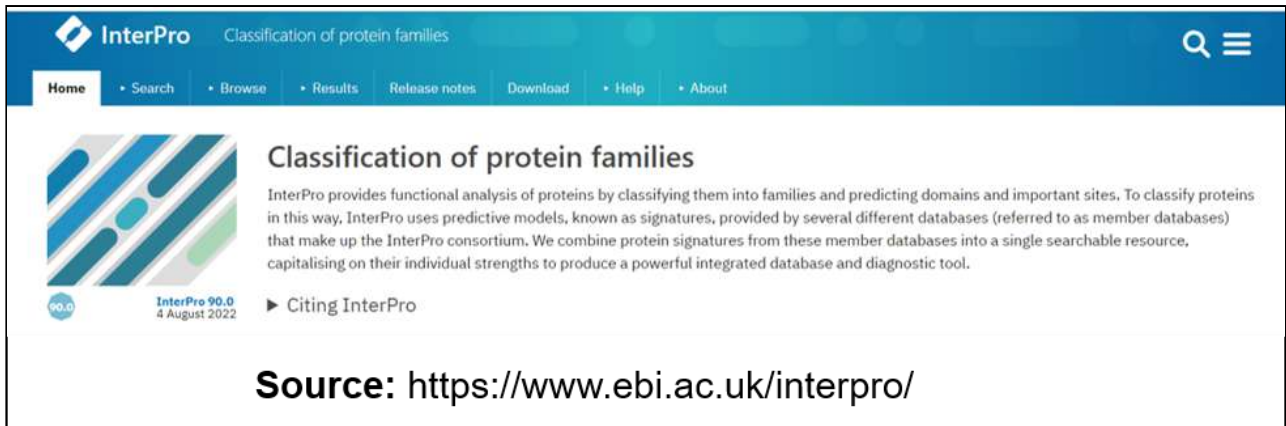
I would say in the STEM field profession, challenges are the same for both men and women, and so do the responsibilities. In India, efforts to encourage girl students to pursue careers in Science, Engineering and Technology are being made at the school level, and incentives through several government schemes are available.

Women in STEM feel lost after post-graduation due to societal norms, they are often married, and for most, the career never takes off. Working women face the pressure to conform to societal norms and trappings of domesticity, stressors related to marriage, childbirth, safe travel to the workplace, etc. Those few who sustain the pressure feel lost after a career break; fortunately, with the support of several government schemes, these get a chance to return. Having a role model/ mentor can certainly help in building their confidence. MERA-India has covered a good number of women scientists in previous issues; reading about the career journey of these fantastic women scientists would have inspired several young women readers to continue careers in STEM.

*5. What significance do you see for MERA-India in achieving India's malaria elimination target?*

MERA-India has initiated research activities to overcome the challenges in malaria infection detection in the field. It has supported many schemes towards developing and implementing novel ways of malaria diagnosis like application of AI or digital interface and generating baseline of low-density infection. Research themes in understanding the role of malaria vectors in changing scenarios of malaria in the country are of high value. It has gathered diverse scientific groups to act together toward filling necessary research gaps for malaria elimination.

# Resource for Malaria Researchers: InterPro



**Source:** <https://www.ebi.ac.uk/interpro/>

Molecular characterization is an important step in any research field, including malaria, either for target identification for drug/vaccine development or studying the function of any member of the molecular pathway for understanding the parasite, host, or host-parasite interactions. Various bioinformatics tools are used for the functional characterization of potential target biomolecules.

[InterPro](https://www.ebi.ac.uk/interpro/) is an online bioinformatics tool that is used frequently by researchers for the functional characterization of target proteins. This database predicts the domains, families, and important sites in the protein of interest. It not only highlights the important sites of the protein but also provides additional information like protein description, Gene Ontology (GO) terms, and references from the literature. To provide accurate and maximum functional information, InterPro combines the signatures of around 13 databases (the Conserved Domains Database (CDD), CATH-Gene3D, PANTHER, PRINTS, HAMAP, Pfam, PROSITE Profiles, PIRSF, PROSITE Patterns, the Structure–Function Linkage Database (SFLD), SMART, TIGRFAMs, and SUPERFAMILY). The query protein sequence is scanned through the signatures of these databases to predict the architecture of the protein.

To explore more about InterPro, please visit their site <https://www.ebi.ac.uk/interpro/>.

## A Child's Perception of Malaria

In this issue, we showcase the sketch by Miss Neha Bhatt, aged eighteen years. Through the sketch, Miss Neha has highlighted the various diseases transmitted through different mosquito species and the simple measures to prevent mosquito breeding and protect oneself from mosquito bites.



**Sketch by:** Miss Neha Bhatt (daughter of Mr Pandeo, ICMR-NIMR, Delhi); **age:** 18 years; **class:** XII

## Upcoming Events

### Distinguished Lecture by Dr Raman Velayudhan

**NIMR**  
NATIONAL INSTITUTE OF  
MALARIA RESEARCH

**icmr**  
INDIAN COUNCIL OF  
MEDICAL RESEARCH

**MERA India**  
Malaria Elimination Research Alliance India  
One Platform, One Goal

**NIMR & MERA-India present Distinguished Lecture**

**“Global Vector Control Response - the last window of opportunity for vector control”**

**Dr Raman Velayudhan**  
Unit Head, Veterinary Public Health,  
Vector Control and Environment unit (VVE),  
Department of Control of Neglected  
Tropical Disease (UCN/NTD),  
World Health Organization (WHO), Geneva, Switzerland

**Wednesday, 12<sup>th</sup> October, 3:00 pm IST**

**Lecture link: <https://bit.ly/MI-DL-Oct22>**

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We are pleased to announce that Dr Raman Velayudhan, Unit Head, Veterinary Public Health, Vector Control and Environment unit (VVE), Department of Control of Neglected Tropical Diseases (UCN/NTD), World Health Organization (WHO), Geneva, Switzerland, will be our Distinguished Lecture speaker next month. He will deliver the lecture entitled "Global Vector Control Response -the last window of opportunity for vector control", on 12<sup>th</sup> October at 1500 hrs IST.

To join this lecture, please click on this link: <https://bit.ly/MI-DL-Oct22>

To receive regular updates about the events being organized by MERA-India, subscribe at [https://www.meraindia.org.in/event\\_sub](https://www.meraindia.org.in/event_sub).

## Announcements

### MERA-India Basic Mosquito Biology Training

**icmr** **NIMR** **MERA India**  
INDIAN COUNCIL OF MEDICAL RESEARCH NATIONAL INSTITUTE OF MALARIA RESEARCH Malaria Elimination Research Alliance India  
One Platform, One Goal

**BASIC MOSQUITO BIOLOGY TRAINING**  
for PhD Students\*

**Tuesday, 18<sup>th</sup> October 2022**  
ICMR-National Institute of Malaria Research, New Delhi

**Highlights**

- Introduction of mosquito biology by **Dr. K Gunasekaran** (Former Scientist-G, ICMR-VCRC, Puducherry)
- NIMR-Insectary visit
- Mosquito developmental stages
- Membrane feeding assay
- Insecticide susceptibility assay
- Interactive sessions with mosquito biology experts

Apply Now: [bit.ly/ApplyBMBTraining](https://bit.ly/ApplyBMBTraining)  
Deadline: 7<sup>th</sup> October 2022 | \*For Delhi/NCR students only

Contact us: [meraindiaevents@gmail.com](mailto:meraindiaevents@gmail.com) /meraindiaicmr

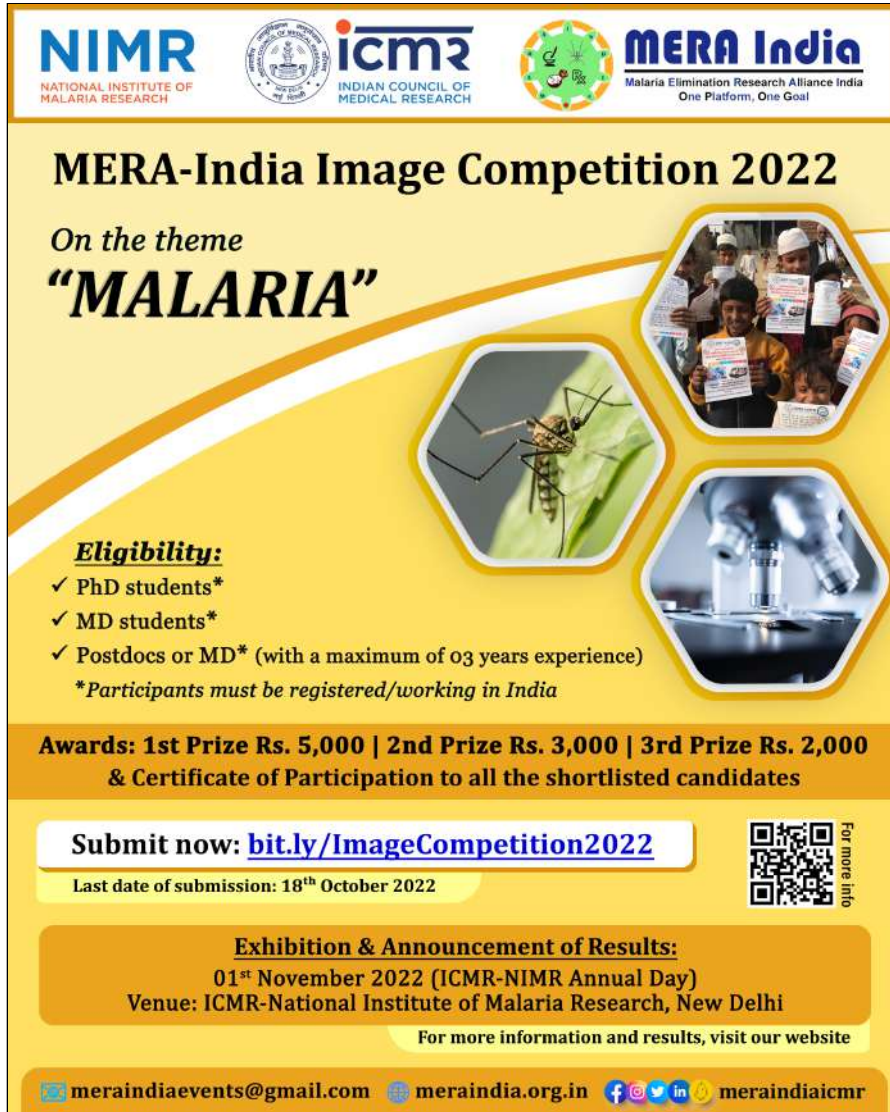
The term entomology is derived from the Greek word “entomon”, which means **insect**, and “logia” means the **study of**; hence entomology is defined as the study the insects. Insects are the carriers of many disease-causing pathogens; therefore, entomology plays an important role in disease control and elimination.

MERA-India is organizing a one-day Basic Mosquito Biology Training ([bit.ly/ApplyBMBTraining](https://bit.ly/ApplyBMBTraining)) for PhD students in Delhi/NCR region to spread awareness about entomology and encourage young researchers to pursue this field. This training will be organized on 18<sup>th</sup> October 2022, where Dr K Gunasekaran (former Scientist-G, ICMR-Vector Control Research Centre, Puducherry) will deliver an informative lecture introducing entomology and its importance with respect to disease control and elimination. The key features of the training include ICMR-NIMR insectary visit, demonstration of mosquito developmental stages, species identification, male-female discrimination, tissue dissection, and insecticide susceptibility assay.

For more details, please visit our website <https://meraindia.org.in>.



# MERA-India Image Competition



The poster features logos for NIMR (National Institute of Malaria Research), ICMR (Indian Council of Medical Research), and MERA India (Malaria Elimination Research Alliance India). The central theme is "MALARIA". It includes three hexagonal images: a mosquito on a leaf, a group of people holding educational materials, and a microscope. The eligibility criteria are listed as PhD students, MD students, and postdocs/MDs with up to 3 years of experience, all registered or working in India. Awards include 1st prize of Rs. 5,000, 2nd of Rs. 3,000, and 3rd of Rs. 2,000, plus a certificate of participation. A submission link (bit.ly/ImageCompetition2022) and a QR code are provided. The results will be announced on 01st November 2022 at the ICMR-NIMR Annual Day in New Delhi.

**NIMR**  
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INDIAN COUNCIL OF  
MEDICAL RESEARCH

**MERA India**  
Malaria Elimination Research Alliance India  
One Platform, One Goal

## MERA-India Image Competition 2022

On the theme  
**"MALARIA"**

**Eligibility:**

- ✓ PhD students\*
- ✓ MD students\*
- ✓ Postdocs or MD\* (with a maximum of 03 years experience)

\*Participants must be registered/working in India

**Awards: 1st Prize Rs. 5,000 | 2nd Prize Rs. 3,000 | 3rd Prize Rs. 2,000**  
& Certificate of Participation to all the shortlisted candidates

Submit now: [bit.ly/ImageCompetition2022](https://bit.ly/ImageCompetition2022)

Last date of submission: 18<sup>th</sup> October 2022

**Exhibition & Announcement of Results:**  
01<sup>st</sup> November 2022 (ICMR-NIMR Annual Day)  
Venue: ICMR-National Institute of Malaria Research, New Delhi

For more information and results, visit our website

[meraindiaevents@gmail.com](mailto:meraindiaevents@gmail.com) [meraindia.org.in](https://meraindia.org.in) [f](#) [@](#) [in](#) [y](#) meraindiaicmr

To highlight the images and significance of images in science and research, MERA-India is organizing an image competition for which original images or photographs are invited from PhD/MD students and postdocs/MDs (with a maximum of three years of experience) working in India. The entries related to malaria research can be submitted for this competition ([bit.ly/ImageCompetition2022](https://bit.ly/ImageCompetition2022)). The winners will be announced on the occasion of the ICMR-NIMR Annual Day event on 01<sup>st</sup> November 2022.

For more details, please visit our website <https://meraindia.org.in>.



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