



Proceedings of the International Conference on 'Innovations and Applications in Life Sciences: Vector-borne Diseases and Antimicrobial Resistance' (IALS-2026)

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Abstract

The International Conference on Innovations and Applications in Life Sciences: Vector-borne Diseases and Antimicrobial Resistance (IALS-2026) was organized by the School of Life Sciences, Swami Ramanand Teerth Marathwada (SRTM) University, Nanded-431606, Maharashtra, India, on 26 and 27 February, 2026. This conference was hosted in an academic collaboration with the Council of Scientific and Industrial Research – National Chemical Laboratory (CSIR–NCL), Pune, India, and was sponsored by the Pradhan Mantri Uchchar Shiksha Abhiyan (PM-USHA) scheme. The conference brought together more than 200 participants from across the country and abroad, including a diverse consortium of scientists, researchers, professionals, academicians, industry experts, and students. The conference served as a platform that brought together eminent scientists and esteemed researchers to deliberate on knowledge and explore collaborative opportunities, providing a fertile environment for exchanging research ideas relevant to the fields of vector-borne diseases (VBDs), antimicrobial resistance (AMR), One Health, and translational research. The proceedings encompassed keynote, plenary and lightning talks that presented research on related themes focusing on vectors and VBDs, AMR under one health platform emphasizing vector and disease ecology, epidemiology, vector management, metagenomics, and AMR surveillance and management at regional, national and international levels.

Keywords: IALS; One Health Approach; Vector-Borne Diseases; Antimicrobial Resistance

Abbreviations

AMR: Antimicrobial Resistance; CSIR–NCL: Council of Scientific and Industrial Research – National Chemical Laboratory; IALS: Innovations and Applications in Life Sciences; MS: Maharashtra State; PM-USHA: Pradhan Mantri Uchchar Shiksha Abhiyan; SLS: School of Life Sciences; SRTMU: Swami Ramanand Teerth Marath-

wada University; USM: Unani System of Medicine; VBDs: Vector-Borne Diseases.

Introduction

Swami Ramanand Teerth Marathwada (SRTM) University was established at Nanded in 1994 by the Government of Maharashtra, and emerged as a premier institution of higher education in the

Marathwada region [1]. The university is committed to academic excellence, cutting-edge research, innovation, and fostering global collaboration. The university is additionally supported by the facilities of Dr. Shankarrao Chavan Government Medical College & Hospital (Dr. SCGMC), Nanded. The School of Life Sciences (SLS) at SRTM University is at the forefront of biological research, offering programmes that integrate traditional knowledge with modern scientific approaches. The faculty members are actively engaged in pioneering research on infectious diseases, antimicrobial resistance, one-health, molecular diagnosis, and public health, thereby establishing the SLS as an ideal venue to organize a two-day IALS-2026 conference, which aptly provides a collaborative environment for exchanging research ideas in the relevant fields [2].

Key themes

The theme of the conference focused on the following:

- Vector and Vector-borne Diseases—Epidemiology, pathogenesis, and control strategies for VBDs and drug-resistant pathogens.
- AMR trends and surveillance—Global and regional surveillance data, resistance patterns and monitoring systems.
- One-Health and Integrated Approach—Collaborative frameworks linking human, animal and environmental health.
- Innovations in Molecular Diagnosis—Next-generation sequencing, point-of-care testing, and rapid diagnostic technologies.
- Artificial Intelligence (AI) and Vector Research—Application of artificial intelligence (AI) and machine learning (ML) in disease prediction, vector surveillance, and drug discovery.
- Translational Research—Bench-to-beside approaches, clinical trials, and therapeutic innovations.

Aims of the conference: Bridging research and practice

Vector-borne diseases (VBDs) remain a major global public health challenge and account for more than 17% of all infectious diseases, with over 1 billion cases and one million deaths annually [3]. Several vector species, such as mosquitoes, ticks, mites, sand flies, and fleas, are responsible for VBDs. Many zoonotic VBDs are making inroads in the current context of human expansion [4]. Similarly, in the 21st century, antimicrobial resistance (AMR) is one of the unsurpassed threats to human and animal health, as well as

to agriculture. It contributes to the spread of resistance genes, creating a silent pandemic' [5]. One health approach addresses these epidemiological interfaces. Modern technologies, such molecular diagnosis, genomic surveillance and use of artificial intelligence (AI) and machine learning (ML) predicting early warning of diseases have made it possible to tackle such diseases in a much efficient manner. This conference aimed to bringing together academicians, scientists, policymakers, students, and industry leaders to foster global collaboration, encourage young researchers, and drive socially relevant scientific advancements in VBDs and AMR.

Inauguration of IALS-2026

The international conference commenced with an inaugural function on February 26, 2026. The event was graced by the esteemed presence of Prof. Manohar G. Chaskar, the Honourable Vice Chancellor, SRTM University, Nanded; Dr. Sudhir B. Deshmukh, Dean, Dr. SCGMC, Nanded; Prof. El Hadji, Amadou Niang, Cheikh Anta Diop University, Dakar, Senegal; Prof. Theeraphap Chareonviriyaphap, Kasetsart University, Bangkok, Thailand; Dr. Ashok Giri, CSIR-National Chemical Laboratory, Pune, India; Prof. B.S. Surwase (SLS, SRTMUN), Prof. S.K. Ghosh (SLS, SRTMUN), Prof. T.A. Kadam (SLS, SRTMUN) and Prof. S.P. Chavan (SLS, SRTMUN). More than 200 delegates had attended the conference. The function was marked by lighting of the lamp and a floral garland portrait of Swami Ramanand. On the occasion, Prof. Chaskar made the inaugural remarks of the conference, welcoming participants and delivering an inaugural talk emphasizing vectors and VBDs that threaten vulnerable populations, particularly in tropical regions. He also mentioned the rising threat of AMR in complicating treatment outcomes and increasing healthcare costs worldwide, which poses various challenges to global public health and highlights the need for innovative research, interdisciplinary approaches and strong international collaboration. He highlighted that with the growing burden of VBD scientists, researchers, academicians and policymakers must work collectively on controlling mosquitoes, VBDs and AMR, which is not only a national priority but also an urgent international necessity. He emphasized the importance of international conferences to facilitate knowledge exchange, promote research, disseminate, and help formulate effective policy interventions. Dr. Deshmukh explained the importance of the IALS-2026 conference and mentioned the growing challenges of vectors, VBDs and AMR and the urgent need for integrated, multidis-

ciplinary, and innovative scientific approaches to safeguard global health. Prof. El Hadji highlighted the importance of Indo-African international collaboration on vectors and VBDs. Prof. Theeraphap emphasized the increasing incidence of zoonotic diseases such as nonhuman primate malaria infections in humans under one-health programmes. The abstract book and souvenir of IALS-2026 were formally released inaugural function (Figure 1).



Figure 1: Inauguration of IALS-2026 releasing the Souvenir.

The messages of Dr. Vinod Paul, Member NITI Aayog, New Delhi, and Dr. Rajiv Bahl, Secretary, Department of Health Research (DHR), Government of India and Director General Indian Council of Medical Research, New Delhi, are conveyed herein. Details of conference souvenir containing several committees and abstracts and some activities of SRTM university is appended [6].

All the participants were captured in a group photo (Figure 2).



Figure 2: Group photo of the delegates attending the IALS-2026.

Scientific session I

Keynote and Plenary talks

On the first day of the conference, eleven eminent scientists from India and abroad delivered talks on their areas of expertise at IALS-2026, and the talks were fully aligned with the core theme of the conference.

Keynote address was delivered by Prof. Theeraphap, a renowned scientist known for his research on nonhuman primate malaria, particularly *Plasmodium knowlesi*, *P. cynomolgi* and *P. inui* in Thailand. His research focus was on the 'Role of *Anopheles* vectors of nonhuman primate malaria in the Greater Mekong Sub-region: a zoonotic disease and One Health approach'. He highlighted that the increasing number of cases of nonhuman primate malaria in humans poses a significant threat to malaria elimination programmes. *Anopheles leucosphyrus*, a forest-dwelling species, serves as the primary vector of Southeast Asian nonhuman primate malaria.

Prof. El Hadji, a well-known vector scientist, delivered a plenary talk on 'Vector control in the age of global challenges: from reactive approaches to innovative and proactive management'. The discussion emphasized the importance of Integrated Vector Management and One Health approaches to align the health, environmental, and development sectors. Prof. Hadji emphasized strengthening domestic financing, cross-sectoral coordination, and equitable access to new tools that are essential for building resilient vector control systems capable of addressing current and future global challenges.

Eminent Scientist Dr. Rakesh Mishra from the Tata Institute for Genetics and Society (TIGS), Bengaluru, elaborately described the importance of environmental surveillance in the systematic monitoring of microorganisms, pathogens, and AMR in environmental reservoirs such as water, soil, air and wastewater to assess potential public risks. The title of his speech was 'Metagenomics and AMR environmental surveillance'.

Prof. Neil F. Lobo from the University of Norte Dame, USA presented virtually (online mode) on 'Closing the gaps: tackling residual on the path to malaria transmission'. He highlighted the change in vector behaviour, and insecticide resistance is the main cause of addressing vector control operations globally. Recent innovation in spatial emanators looks promising.

From Industries, Dr. A.N. Shanthilya, Bigtec Labs Pvt. Ltd. (Mol-bio Diagnostics), Bengaluru, India, demonstrated scale-able, decentralized molecular diagnostics in resource-constrained environments – a critical need in modern healthcare. He further added that through the EDGE programme, engagement with innovators accelerated go-to-market traction and expanded access to innovative solutions in undeserved settings. The title of his talk was 'Decentralizing molecular diagnostics: from innovation to impact'.

Prof. Kimberly Fornace, an eminent climate scientist from the National University of Singapore, presented virtually on 'The emergence of zoonotic malaria across Southeast Asia'. Like Prof. Theeraphap, she highlighted the effects of climate change on nonhuman primate malaria in Southeast Asia and malaria elimination.

Dr. Jirod Nararak from Kasetsart University, Bangkok, described plant-derived repellents such as botanical extracts, essential oils, and purified natural compounds as promising and more sustainable alternatives. The title of the talk was 'Plant-derived mosquito repellents in Thailand: evidence and excitorepellency (ER) screening'.

Another industry start-up entrepreneur, Prasad Phadke from Ecobio Consulting Pvt. Pune, India, demonstrated how lethal ovitraps can be used in vector surveillance and as an early warning system for mosquito surveillance. The title of his speech was 'Eco-Biotraps: an innovative adjunct vector control device'.

Scientific session II

The second day commenced with scientific presentations given by leading experts in relevant disciplines.

Dr. Harish C. Phuleria, an eminent scientist from the Indian Institute of Technology (IIT), Mumbai, addressed the nationwide malaria distribution online, where he mentioned that the tribal population most vulnerable to malaria transmission. The title of the talk was 'Nation-wide analysis of malaria distribution in India between 2018 and 2023 and its potential drivers' in virtual mode.

Dr. Rina Tilak, a renowned scientist working on Scrub typhus from Armed Force Medical College (AFMC), Pune, presented virtually on 'Scrub typhus in India: an emerging neglected vector-borne zoonosis'. She emphasized the alarming rise of scrub typhus, creating a resurgent health threat in India and suggested that with swift, coordinated action across research, medicine, and decisive leader-

ship, India can turn this looming crisis into a public health success story.

Dr. Arish M Sherwani, a scientist from the National Institute of Unani Medicine (NIUM), Bengaluru, discussed the coordinated approaches of USM (Unani System of Medicine) in addressing AMR. According to him standardization techniques, preclinical, clinical, epidemiological and field trials together with collaborative approaches are needed to strengthen, validate, and re-validate the traditional treasures of the USM. The title of the talk was 'Coordinated approaches of USM (Unani System of Medicine) in addressing AMR'.

Dr. Srikant Nema, a research scientist from the International Centre for Genetic Engineering and Biotechnology (ICGEB), New Delhi, delivered his talk on histidine-rich domain-containing secretory protein (HDCSP) via bioinformatics and phylogenetic tools to assess the conservation and species specificity of *Plasmodium*. The title of his speech was '*Plasmodium falciparum* histidine-rich domain-containing secretory protein as a novel diagnostic biomarker for malaria detection and its role in immunomodulation'.

Furthermore, Dr. Ashok Giri a senior scientist from CSIR-NCL, Pune, illustrated that metabolites have great significance in sustainable crop protection in agriculture, increasing the nutritional value of food. Additionally, using advanced multiomics methods, such as next-generation sequencing, proteomics, metabolomics, and bioinformatics, his team discovered the biosynthetic pathways of important metabolites from potato, tomato and mango. The title of his talk was 'My journey as a plant biologist: from tailoring to tailoring plant metabolism'.

Oral and poster sessions

Day 2 of the conference also featured lighting talks and poster presentations by young researchers from various colleges and universities. The session highlighted key studies on understanding VBDs, vector control, AMR, One Health, vector and AI, and molecular diagnostics.

Oral presentations

- Krishna PR (Rajashree Shahu Mahavidyalaya, Latur, MS) presented his work about honey eDNA and AI surveillance, which serve as scale-able, cost-effective, and ecosystem-wide health intelligence within the One Health frame work and as a uni-

fying interface between ecology, epidemiology and digital health.

- Padghane N (Deogiri College, Chharapati Sambhajinagar, MS) presented arginine oleate and its role as a promising surfactant for micellar drug delivery with improved antimicrobial performance.
- Pawar PV (NES Science College, Nanded, MS) presented her novel work regarding holistic vector control in the Indian environment.
- Kadam PV (Yeshwant College, Nanded, MS) presented antimicrobial resistance in food-borne pathogens and its consequences for antibiotic use in livestock production.
- Maithilee T Kadam (Dr. SCGMC, Nanded, MS) discussed on ceftriaxone-induced anaphylactic shock in a term pregnant woman and its life-threatening adverse drug reactions.
- Harangule AC (Sir Parashurambhau College, Pune, MS) presented methods for harnessing next-generation molecular diagnosis to combat antimicrobial resistance.
- Kedar AP from Vidya Bharati College (Amravati, MS) investigated the antibiotic resistance of silver (Ag) nanoparticles synthesized from aqueous bulb extracts of *Scilla hyacinthine*.
- Reddy VA (Rajashree Shahu Mahavidyalaya, Latur, MS) discussed emerging threats of antimicrobial resistance in vector-borne diseases and its global perspectives.
- Ghanwate N (Sant Gadge Baba Amravati University, Amravati, MS) explained his research on the epidemiology of rapidly emerging uropathogens isolated from urinary catheters and the influential demographic factors responsible for contamination.
- Bhagwat Lad (SLS, SRTM University, Nanded, MS) described his research on the antibiotic susceptibility pattern of uropathogenic *Escherichia coli* isolated from urine samples.
- Gundale M (SLS, SRTM University, Nanded, MS) described the evaluation of triethylenemelamine as a potential inhibitor of testosterone 17-beta dehydrogenase (NADP+) for targeted anticancer therapy.
- Pathan AK (Dr. Babasaheb Ambedkar Marathwada University, Dharashiv, MS) discussed the design, synthesis and screening of heterocyclic compounds against multidrug-resistant bacteria.

Poster presentations

- Hashmi M.R. (Rajashree Shahu Mahavidyalaya, Latur, MS) explained her research, which focused on disease transmission, diagnostic methods, and resistance patterns, highlighting AMR trends and surveillance views of mycobacterial infections in *Betta splendens*. From the same college, RS Chaudhari discussed sustainable metal nanoparticles as emerging tools for antimicrobial resistance control and their implications for aquaculture and major carps.
- Dharware DB (Dr. B. A. M. University, Dharashiv, MS) presented her work on a 2-year cross-sectional, hospital-based study to determine the prevalence and distribution of bacterial pathogens and reported that 89.64% (329/367 patients) of positive bacterial growth and 10.35% (38/367) were negative.
- Narwade SP (Dr. B.A.M. University, Dharashiv, MS) highlighted the predominance of multidrug-resistant bacteria in surgical site infections.
- Yeole SM (Sri Shivaji College, Parbhani, MS) emphasized the significant role of freshwater benthic biodiversity in lowering the risk of vector-borne diseases.
- Durnale P (NES Science College, Nanded) provided an overview of the role of AI in vector-borne disease prevention.
- Renuka Y (Sant Gadge Baba Amravati University, Amravati, MS) described a rapid CRAB vigilance kit for precision screening of carbapenem-resistant *Acinetobacter baumannii*.
- Reddy VA (Rajarshi Shahu Mahavidyalaya, Latur, MS) discussed the emerging threats of AMR in vector-borne diseases and its global perspective.
- Pooja AS (SLS, S.R.T.M. University, Nanded) presented her research on the in vitro evaluation of the antibacterial and antifungal efficacy of *Actinomyces* derived from undisturbed forest rhizospheres.
- Thakare P (Sant Gadge Baba Amravati University, Amravati) discussed the distribution of various integron classes in uropathogenic *Klebsiella pneumoniae* isolates from tertiary healthcare hospitals in Amravati.
- Ambhore SA (Dr. B.A.M. University, Chhatrapati Sambhajinagar, MS) presented his work on low-frequency electromagnetic field exposure triggering oxidative imbalance and genomic instability in *Drosophila nasuta*, which has implications for vector biology and translational disease research.

Awards for oral and poster presentations

In the oral and poster sections, award certificates were offered to young researchers on the basis of their scientific merit, innovative research and effective communication. The selected members are listed below.

Oral

- Khandu Wadhonkar, Department of Biosciences and Biomedical Engineering (BSBE), IITI, Indore, India. Title: A novel molecular mechanism driving macrophage phenotypic switching during colorectal cancer progression.
- Maithilee T. Kadam, Department of Pharmacology, Dr. Shankarrao Chavan Government Medical College, Nanded, MS, India. Title: Ceftriaxone-induced anaphylactic shock in a term pregnant woman: a rare but life-threatening adverse drug reaction.
- Aisha Khan Pathan, Department of Microbiology, Dr. Babasaheb Ambedkar Marathwada University, Subcampus Dharashiv, MS, India. Title: Design, synthesis and screening of heterocyclic compounds against multidrug-resistant bacteria.
- Nandini Padghane, Department of Biotechnology, Deogiri College, Chhatrapati Sahajanagar, MS, India. Title: Development of an arginine oleate-mediated drug delivery system.

Poster

- Renuka Yende, Department of Microbiology, Sant Gadge Baba Amravati University, Amravati, MS, India. Title: Rapid CRAB vigilance kit: precision screening for carbapenem-resistant *Acinetobacter baumannii*.
- Hashmi M.R., Department of Zoology and Fishery Science, Rajarshi Shahu Mahavidyalaya, Latur, MS, India. Title: Antimicrobial surveillance of *Mycobacterium tuberculosis*: identification, impediments and improvements for disease management in *Betta splendens* (Regan).

Valedictory ceremony

The ceremony started with welcoming esteemed guests, Prof. Ashok M. Mahajan (Pro Vice Chancellor, SRTMU, Nanded), Dr. D. D. Pawar (Registrar, SRTMU, Nanded), Prof. El Hadji (CAD University, Dakar), Dr. Ashok Giri (CSIR-NCL, Pune), Prof. B.S. Surwase (SLS, SRTMU, Nanded), Prof. S.P. Chavan (SLS, SRTMU, Nanded), and Prof. L. H. Kamble (SLS, SRTMU, Nanded) on the dais. The two-day con-

ference was summarized by Prof. B.S. Surwase, who highlighted the theme, key outcome and takeaways for young researchers and students. The chief guest, Prof. Mahajan, addressed the gathering and provided encouraging and thoughtful remarks. Dr. D.D. Pawar, presented the certificates to the winners for the best oral and poster presentations (Figure 3). Prof. L. H. Kamble proposed the vote of thanks and acknowledged the speakers, guests, participants and organizers. The conference concluded with High Tea.



Figure 3: Valedictory function of IALS-2026 showing oral and poster awardees.

Concluding Remarks

The conference brought together eminent and emerging scientists from across the country and around the world, providing space for discussions, collaboration, networking, and shared memories. It was a successful conference because of its great organization, meticulous planning, ability to engage speakers and participants, high-quality presentations, eminent plenary speakers, encouraging young researchers, excellent attendance, good culinary, and excellent hospitality.

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Authors' Contributions

C.G. and S.K.G. conceptualized the proceeding manuscript, wrote the first draft, edited and reviewed the manuscript. V.B.S. edited the manuscript. B.S.S., V.B.S., M.G.C., S.T.H., S.A.K. and S.U.C. reviewed the manuscript. All authors read and approved the final version of the proceeding for publication.

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Data Availability

Access to the original recordings is subject to review of a written request to the corresponding author.

Declaration of Interests

The authors declare that they have no conflicts of interest.

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