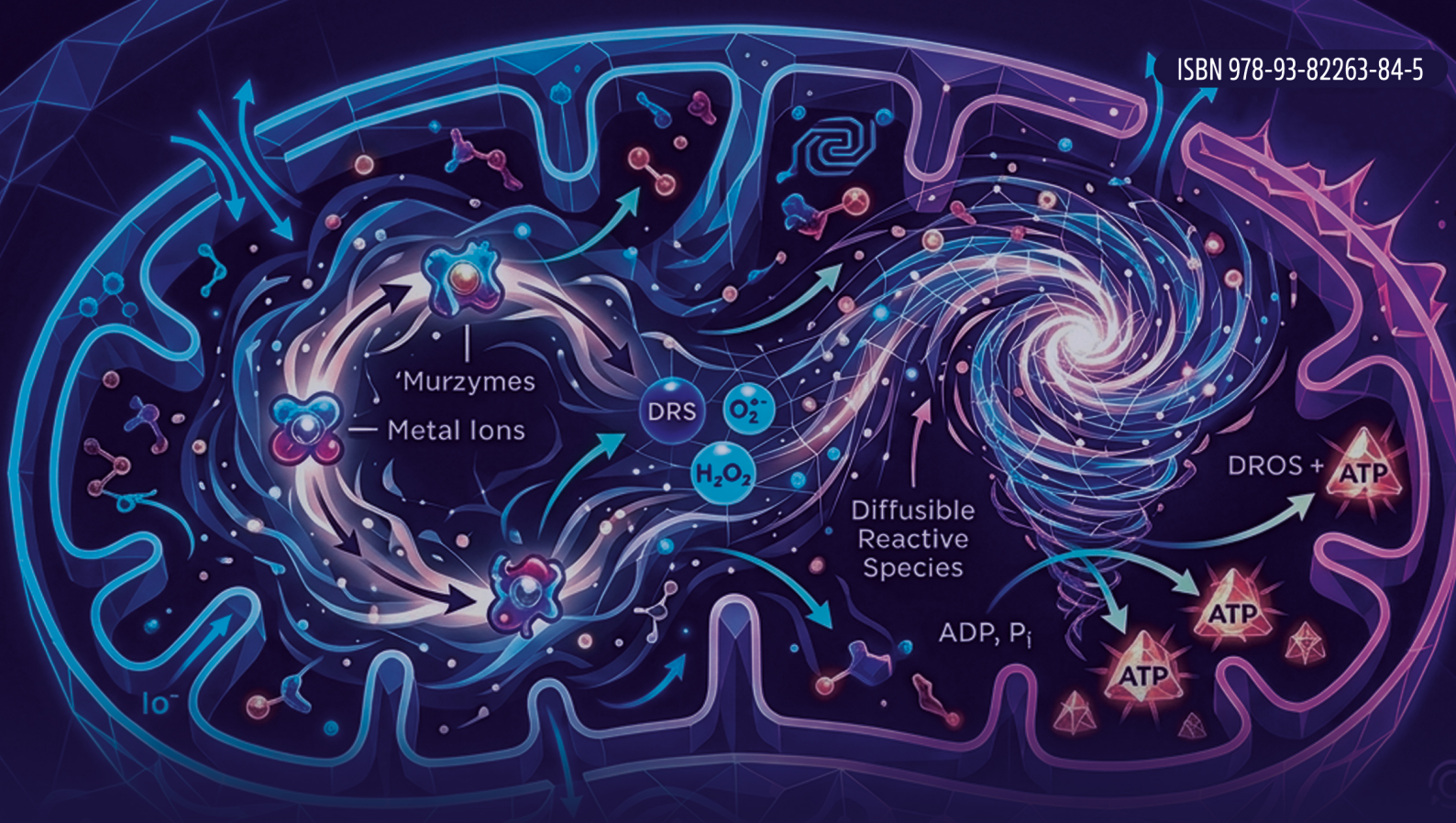




ICAR-Central Marine Fisheries Research Institute, Kochi

Proceedings of the **MURBURN CONCEPT DISCUSSION FORUM 2026**

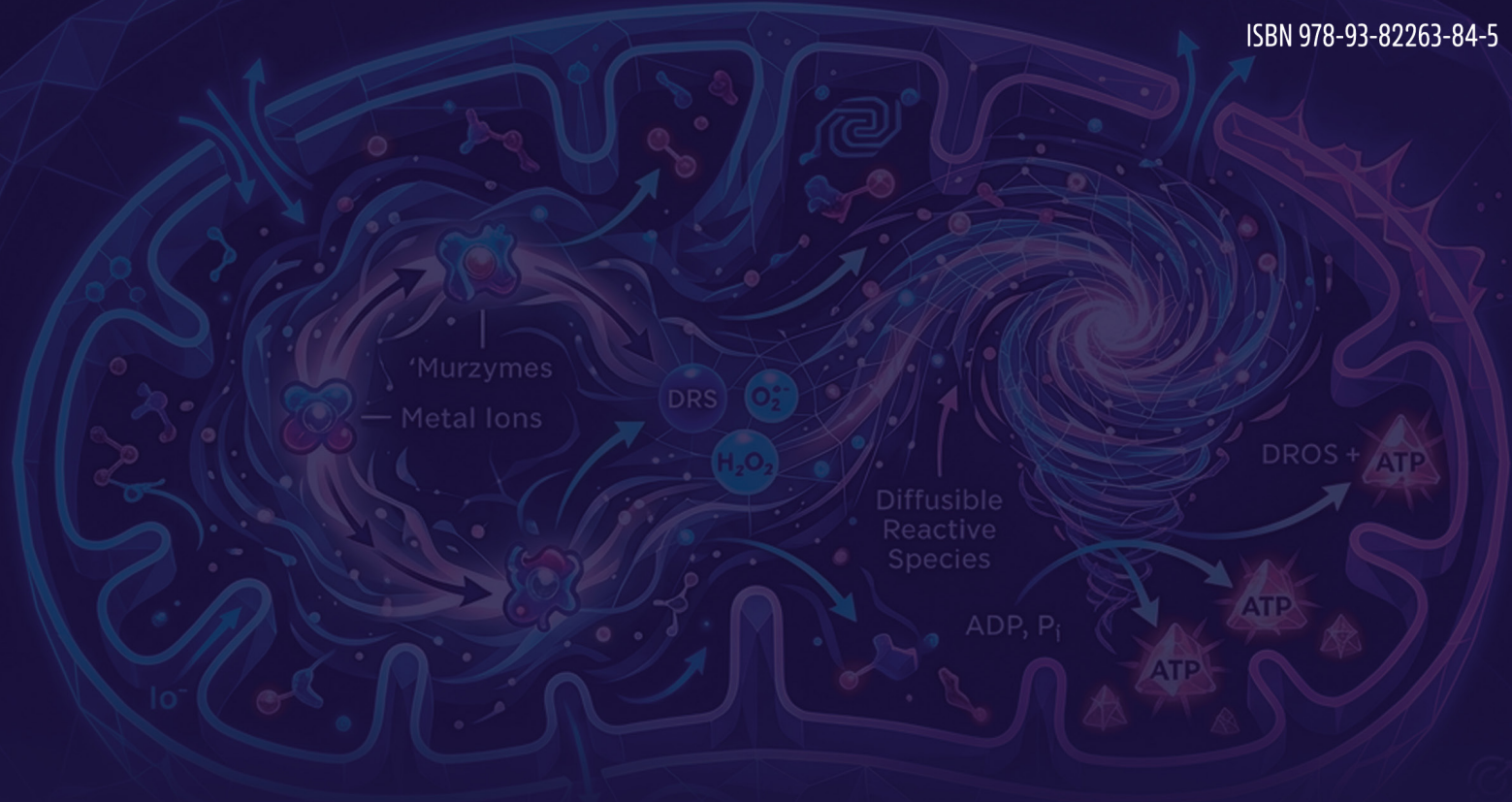
**3-4
August
2026**

National Seminar and Brainstorming

Organizers

Swadeshi Science Movement Kerala (Vijnana Bharati)
ICAR-Central Marine Fisheries Research Institute, Kochi
Amrita Vishwa Vidyapeetham





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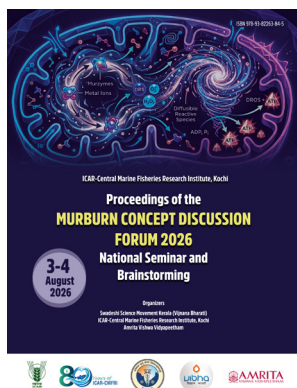
Editors

Muralidharan Kunnathodi
Kelath Murali Manoj
Ashish Khandelwal

Organizers

Swadeshi Science Movement Kerala (Vijnana Bharati)
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Dr. Grinson George
Director

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Edited by

Muralidharan Kunnathodi, Programme Coordinator, SSMK
Kelath Murali Manoj, Amrita Vishwa Vidyapeeth
Dr. Ashish Khandelwal, Senior Scientist, ICAR-CMFRI, Kochi

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FOREWORD

It was a distinct privilege for ICAR-Central Marine Fisheries Research Institute (ICAR-CMFRI) to host the Murburn Discussion Forum 2026: National Seminar and Brainstorming, organized in collaboration with the Swadeshi Science Movement–Kerala (SSM-K) during 3–4 August 2026.

The concept of “mured burning”—postulating a stochastic, controlled redox process—presents a fascinating alternative perspective with far-reaching implications across bioenergetics, xenobiotic metabolism, and cellular/microbial physiology. At ICAR-CMFRI, we remain steadfast in our commitment to fostering robust, frontier scientific dialogues that stimulate intellectual curiosity and directly benefit our early-career researchers, faculty, and postgraduate scholars.

Structured around six thematic plenary lectures, each paired with dedicated discussants and vibrant interactive deliberative sessions, the forum provided an exceptional learning platform. For researchers at CMFRI, the seminar offered a compelling lens through which to explore the applicability of murburn kinetics in bioenergetics, environmental toxicology, and ecology/physiology. Above all, it served as a premier platform celebrating and engaging with the academic leadership of Prof. Kelath Murali Manoj, who pioneered and developed this paradigm.

This volume compiles the insights, academic debates, and strategic recommendations emerging from the two days of intensive brainstorming. The scientific panels outlined actionable pathways: bridging computational modeling with bench-scale experimental assays, systematically evaluating competing bioenergetic paradigms, embedding stochastic redox chemistry into pharmacological frameworks, and nurturing cross-institutional research consortia. Alongside these deliberations, this compilation features the presentation abstracts, session syntheses, and archival documentation of the event.

I place on record my sincere gratitude to the members of the organizing committee, invited plenary speakers, designated discussants, rapporteurs, and delegates whose contributions elevated the intellectual vitality of this forum. I extend special appreciation to Prof. K. Muralidharan, Dr. Ashish Khandelwal, and the dedicated teams from ICAR-CMFRI and SSM-K for their meticulous planning and tireless execution.

As you navigate through these proceedings, I invite you to share in the vibrant spirit of inquiry and open scientific contestation that animated this national forum. May this compilation serve not as a concluding remark, but as an enduring catalyst for rigorous, cross-disciplinary research aimed at evaluating and refining the murburn concept in the years ahead.

Dr. Grinson George
Director

ICAR–Central Marine Fisheries Research Institute (ICAR-CMFRI)
Kochi, Kerala



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MURBURN CONCEPT DISCUSSION FORUM 2026

National Seminar and Brainstorming Workshop

Executive Summary

Murburn concept (derived from “mured burning”) is a paradigm shift in the theoretical framework for redox biology and bioenergetics. A two-day seminar-cum-brainstorming on advances in murburn theory and applications was held at ICAR-Central Marine Fisheries Research Institute, Kochi, during 3–4 August 2026 by the Swadeshi Science Movement Kerala (Vijnana Bharati) in collaboration with ICAR-CMFRI and Amrita Vishwa Vidyapeetham. Number of registrants attended was 125—comprising 105 students and 20 faculty members. Additionally, over 30 senior faculty members, subject matter specialists, and institutional heads attended as invited expert delegates. The scientific panel discussions, conducted in hybrid mode with active participation from multidisciplinary researchers across India and abroad (Japan, Germany, Slovenia, Belgium, Oman, Italy and the United States).

Organized under the leadership of Dr. Grinson George, Director, who served as the Chairman of the Organizing Committee, the seminar commenced with an inaugural address delivered by Prof. P. Raveendran, Vice Chancellor of Calicut University. The academic program featured six technical sessions focused on a Keynote on the murburn concept; Biochemistry, Bioenergetics & Biomechanisms; Drug Metabolism, Dose Responses & Medicine; Electro/Neuro/Mechano-physiology; and Microbial/Plant

Physiology & Ecology. Concluding the event, Prof. K. V. Venkatesh from the Department of Chemical Engineering at the Indian Institute of Technology (IIT) Bombay and Founder of MetFlux delivered the valedictory lecture.

The central premise of the murburn framework, pioneered by Prof. Kelath Murali Manoj and collaborators, is that certain enzymes and membrane interfaces drive controlled stochastic redox reactions to power localized biochemical transformations. These principles were evaluated across diverse biological phenomena, offering fresh explanatory models for mitochondrial ATP synthesis, xenobiotic metabolism, the structure and role of haemoglobin in erythrocyte physiology, and the pan-systemic relevance of hydrated biopolymers, affording a seamless perspective on the evolutionary emergence of aerobic life.

The panel of experts recommended the following lines of work in the future: (i) combine bioinformatics, high-resolution spectroscopy, kinetic assays, and molecular simulations to rigorously validate the physiological relevance of stochastic, radical-mediated catalytic pathways; (ii) systematically compare competing paradigms; (iii) incorporate stochastic redox chemistry into pharmacokinetic and pharmacodynamic (PK/PD) frameworks; (iv) foster interdisciplinary research consortia; and (v) pursue academic outreach and pedagogical integration.

REPORT

Background

Murburn concept (derived from “mured burning”, referring to a kind of “confined micro-combustion” or “mild unrestricted redox catalyses”) offers a novel theoretical framework for explaining redox biology and bioenergetics. It re-evaluates classical deterministic electron transport chains, extends beyond lock-and-key enzyme catalysis, and critiques the chemiosmotic hypothesis. Pioneered by Prof. Kelath Murali Manoj and collaborators, the paradigm posits that cellular energy transduction and several enzymatic reactions are governed by stochastic, delocalized electron transfers mediated by diffusible reactive species (DRS) within confined biological matrices. In this framework, redox enzymes (such as hemeproteins) function as “murzymes”—catalytic agents that generate and modulate transient radical fluxes and mediate interfacial effective charge separation (ECS) to drive cellular metabolism, ATP synthesis, electrophysiological coherence, and physiological homeostasis.

To catalyse cross-disciplinary research on the murburn concept, a national brainstorming workshop entitled “Murburn Concept: Rethinking Redox Catalysis, Bioenergetics and Homeostatic Physiology” was held at the ICAR-Central Marine Fisheries Research Institute (ICAR-CMFRI), Kochi, during 3–4 August 2026. The seminar was organized by the Swadeshi Science Movement Kerala (SSM-K; Vijnana Bharati) in collaboration with ICAR-CMFRI and Amrita Vishwa Vidyapeetham. This marks the third national-level academic forum dedicated to murburn concept, following the inaugural workshop at IIT Bombay (15–16 March 2023) and the national symposium at Amrita Vishwa Vidyapeetham (28–30 May 2024).

Participation Profile

The programme was specifically tailored for postgraduate students, doctoral scholars, and early-career researchers to engage them in ongoing theoretical and experimental developments of the murburn concept. Accordingly, registration was complimentary for this target group, while a nominal fee of ₹1,000 was charged for other delegates.

Of the 250+ registered participants, 125 attended in person—comprising 105 students and 20 faculty members. Additionally, over 30 senior faculty members, subject matter specialists, and institutional heads attended as invited expert delegates (see Appendix 1).

Inaugural Session

Prof. P. Raveendran, Vice Chancellor of the University of Calicut, inaugurated the event. In his inaugural address, he commended the years of dedicated research by Prof. Kelath Murali Manoj in formulating the murburn concept, observing that it introduces a transformative perspective to modern cell biology. Emphasizing its chemical foundation, he noted that the model is inherently cross-disciplinary, integrating biochemical pathways with physical principles and quantitative physical-chemical frameworks.

In his welcome address, Dr. Grinson George, Director of the host institution (ICAR-CMFRI), observed that several fundamental questions in bioenergetics and physiology remain open to investigation, expressing confidence that the murburn framework offers fresh scientific avenues to address these knowledge gaps.

Dr. K. Muralidharan, former Principal Scientist at ICAR-CPCRI and former President of SSM-K, briefed the gathering on the background and scope of the workshop. Commending the global interest generated by this homegrown conceptual framework, he encouraged early-career researchers to rigorously examine and expand the paradigm across physical and biological disciplines.

The Guest of Honour, Prof. Dr. Damodaran M. Vasudevan, Dean of Research at Amrita Vishwa Vidyapeetham, noted that core principles of the murburn concept had already been introduced in a recent edition of his textbook on medical biochemistry, expressing his commitment to expanding these concepts in upcoming editions in consultation with Prof. Kelath Murali Manoj.

Shri Vivekananda Pai, National Secretary of Vijnana Bharati, underscored the critical importance of timely and proactive science communication, referencing

historical scientific milestones involving Prof. S. N. Bose and Sir C. V. Raman. He reaffirmed Vijnana Bharati's commitment to providing scientific platforms for evaluating indigenous theoretical and experimental breakthroughs.

Presiding over the ceremony, Prof. V. Siva Kumar, President of SSM-K, placed on record sincere appreciation to ICAR-CMFRI for hosting the seminar. Dr. Ashish Khandelwal, Senior Scientist at ICAR-CMFRI and Programme Coordinator, delivered the formal vote of thanks.

As part of the inaugural proceedings, SSM-K felicitated Prof. Kelath Murali Manoj. Prof. V. P. N. Nampoori, Emeritus Professor at CUSAT and former President of SSM-K, presented him with a ceremonial shawl, a certificate, and a memento. Following the felicitation, Prof. P. Raveendran officially released recent ICAR-CMFRI scientific publications along with an institutional product.

Session 1

Keynote Address

Title: Murburn Concept – How Do We Live and Why Do We Die?

Keynote Speaker: Prof. Kelath Murali Manoj (Prof. KMM), Amrita Vishwa Vidyapeetham

Session Chairs:

- **Prof. P. Raveendran,** Vice Chancellor, University of Calicut
- **Prof. Dr. Damodaran M. Vasudevan,** Dean of Medical Research, Amrita Vishwa Vidyapeetham
- **Prof. P. Venugopal,** Department of Chemistry, University of Calicut
- **Dr. Grinson George,** Director, ICAR-Central Marine Fisheries Research Institute (ICAR-CMFRI)

Online Discussants:

- **Prof. P. K. Babu,** Department of Physics and Chemistry, Western Illinois University, USA
- **Dr. Marko Vitas,** Agency for Medicinal Products and Medical Devices, Slovenia
- **Prof. Rajendran Pilankatta,** Dean, School of Biological Sciences, Central University of Kerala, Kasaragod

Summary & Deliberations

Prof. KMM delivered the keynote address, introducing murburn concept as a unifying paradigm capable of linking fundamental redox metabolism with cellular homeostatic physiology with systemic biological coherence.

The keynote and subsequent panel deliberations critically examined the biological role of oxygen. Within the murburn framework, some enzymes and membrane interfaces act as catalytic sites for controlled stochastic redox reactions. Driven by effective charge separation (ECS) and sustained release dynamics (SRD), these interfaces generate

diffusible reactive species (DRS), enabling cells to function as simple chemical engines (SCE). Rather than existing solely as toxic metabolic byproducts, DRS function as essential physiological intermediates. This establishes an intracellular chemico-electromagnetic matrix (CEM) governing acute biological intelligence alongside powering, coherence, homeostasis, electro-mechanical, and sensing-response (PCHEMS) activities. The presentation examined these dynamics in relation to oxidative phosphorylation (ATP synthesis), thermogenesis, erythrocyte physiology, metabolic regulation, and the evolutionary origins of aerobic life.

The session chairs and online discussants situated the murburn framework within systems biology, noting that competing bioenergetic models must be judged strictly on predictive accuracy, thermodynamic consistency, and experimental reproducibility rather than historical precedent.

The panel identified several longstanding bioenergetic anomalies as prime experimental grounds for comparative testing between classical and murburn-based frameworks:

- Observed coupling efficiencies and mechanisms of non-shivering thermogenesis.
- Survival dynamics and baseline energy generation in anucleated, non-mitochondrial cells such as erythrocytes.
- Spatial and temporal detection of DRS at physiological levels in contrast to contested localized proton-gradient measurements.

The session closed with consensus on the necessity of identifying targeted, measurable physical-chemical parameters to empirically benchmark murburn-mediated pathways against classical chemiosmotic models.

Session 2

Biochemistry, Bioenergetics & Biomechanisms

Session Chairs:

- **Prof. P. Venugopal**, Department of Chemistry, University of Calicut
- **Dr. N. H. Mohan** (Online), Director, ICAR-National Bureau of Animal Genetic Resources (NBAGR)

Online Discussant:

Dr. G. R. Sridhar, FNAE, FRCP, Director, Endocrine and Diabetes Research Centre, Visakhapatnam

Presentations

Why is Cyanide Acutely Toxic?

Speaker: **Mr. Vivian David Jacob**, Amrita Vishwa Vidyapeetham

Deliberations: Re-evaluated the molecular mechanism of acute cyanide poisoning. Rather than attributing acute toxicity strictly to stoichiometric active-site inhibition of cytochrome c oxidase (Complex IV), the murburn model proposes that cyanide rapidly quenches obligatory diffusible radical intermediates necessary for mitochondrial ATP synthesis and cellular electrophysiology. Kinetic and thermodynamic analyses were presented showing that classical active-site saturation models cannot adequately account for immediate mortality at micromolar concentrations, whereas radical scavenging offers a thermodynamically/kinetically viable, direct mechanism.

Mucus: A Murburn Moderator

Speaker: **Prof. Prasad Burra**, Koneru Lakshmaiah Education Foundation (KLEF), Guntur

Deliberations: Redefined mucus and associated extracellular matrices (ECMs) from passive physical barriers into active, dynamic redox buffers and non-equilibrium catalytic zones. The presentation highlighted how the mucin hydrogel network physically constrains and modulates DRS originating from metabolic activities and mechano/tribo-chemical events, mediating mucosal protection, antimicrobial defense, epithelial signaling, utero-vaginal mucus dynamics and osmotic homeostasis.

Algorithmic Tracing of Murzymes

- **Speaker: Dr. Vinith Rejathalal**, Amrita Vishwa Vidyapeetham

Deliberations: Outlined computational structural biology pipelines and algorithmic workflows designed to identify catalytic signatures of candidate murzymes across metabolic pathways. This computational methodology represents a key step in moving murburn hypotheses from qualitative formulations toward quantitative, reproducible predictions.

Summary & Deliberations

The session examined the catalytic behavior of controlled redox dynamics across diverse enzyme systems. Deliberations focused on the roles of murzymes and matrices which modulate DRS fluxes rather than conforming strictly to classical lock-and-key Michaelis–Menten substrate binding.

This non-classical framework (in contrast to conventional models centered on active site catalysis alone) or murburn explanation does not refute or disclaim the classical mechanism for diverse process. Instead, it points out that several metabolic and physiological outcomes cannot be accounted by active-site catalyses alone and mut factor in diffusible reactive species as intermediates or protagonists.

Acohesivenarrativeconnectedtheindividualpresentations: Species like hydrogen cyanide (HCN) traverse membrane phases unimpeded, directly scavenging cellular radical pools and altering cellular bioenergetics and coherence. Structured hydrogel matrices like mucus serve as frontline barriers capturing DRS and macromolecular toxins. Following the presentations, the chairs and Dr. G. R. Sridhar discussed the broader toxicological, clinical, and computational implications of these findings.

Student-interactions & Murburn-science Quiz

Firstly, the attending students availed an extended and open-agenda platform to interact with the speakers of the day. The first day's proceedings concluded with an interactive science quiz conducted jointly by Dr. A. R. S. Menon (SSM-K) and Prof. KMM. The session stimulated wide cross-floor engagement, drawing active participation and technical questions from student delegates as well as senior researchers across the audience.

Session 3

Drug Metabolism, Dose Responses & Medicine

Session Chair:

- **Prof. Sabitha M.**, Principal, Amrita School of Pharmacy, Amrita Vishwa Vidyapeetham
- Session Discussants:
- **Dr. G. R. Sridhar** (Online), FNAE, FRCP, Director, Endocrine and Diabetes Research Centre, Visakhapatnam
- **Prof. (Dr.) N. Suresh Nair**, Kerala Veterinary and Animal Sciences University (KVASU)
- **Dr. Ashish Khandelwal**, Senior Scientist, ICAR-Central Marine Fisheries Research Institute (ICAR-CMFRI)

Presentations & Special Addresses

Cytochrome P450s (CYPs) & Unusual Dose Responses

Speaker: **Dr. Abhinav Parashar**, Charotar University of Science and Technology (CHARUSAT), Gujarat

Deliberations: Presented experimental evidence supporting murburn mechanisms in microsomal xenobiotic metabolism, focusing on heme enzyme CYPs (mixed oxidases and monooxygenases) and flavoenzyme reductases. The findings challenged pure substrate-binding affinity kinetics by demonstrating that diffusible reactive oxygen species (DROS) drive metabolic transformations directly. The discussions also led to novel explanations for hormetic and idiosyncratic dose responses.

Lactate Dehydrogenase (LDH) & Cyclooxygenase (COX)

Speaker: **Dr. Daniel Andrew Gideon**, St. Joseph's University (SJU), Bengaluru

Deliberations: Explored murburn catalysis in LDH and COX systems, challenging traditional catalytic pathways and proposing an obligatory, functional role for reactive oxygen species in enzymatic turnover and regulation. Both these enzyme systems are highly relevant in clinical and experimental medicine, serving

as markers and immunological activators, respectively.

Special International Message

Prof. George Chaldakov, MD, PhD (President, Bulgarian Society for Cell Biology; Editor-in-Chief, Biomedical Reviews), Medical University, Varna, Bulgaria

Delivered Online by: Dr. Laurent Jaeken, Karel de Grote Hogeschool, Antwerp, Belgium

'Dr. Jaeken presented Prof. Chaldakov's address and shared his own perspectives aligning the murburn concept with the coacervate model of cell organization. The address critiqued classical membrane ion-pump dogmas and chemiosmotic theory, highlighting murburn as a viable paradigm shift toward integrated cell physiology'.

Summary & Deliberations

The session examined the therapeutic, toxicological, and pharmacological implications of replacing lock-and-key binding kinetics with stochastic redox dynamics. Dr. G. R. Sridhar shared reflections from long-term clinical research (on butylcholinesterases), evaluating in vivo applicability alongside Prof. Sabitha M., Prof. N. Suresh Nair, and Dr. Ashish Khandelwal.

The panel concluded that incorporating stochastic DRS dynamics into pharmacokinetic and pharmacodynamic (PK/PD) frameworks offers mechanistic clarity on several persistent pharmacological anomalies:

- Molecular mechanisms underlying idiosyncratic drug toxicities and unpredictable drug-drug interactions.
- Non-linear, biphasic, and hormetic dose-response behaviors that elude classical receptor-saturation models.
- Development of predictive mathematical simulations for personalized medicine and refined therapeutic dosing regimens.

Session 4

Mechano-physiology, Vision & Electro-/Neuro-physiology

Session Chairs:

- **Dr. Krishnakumar Menon**, Centre for Nanosciences and Molecular Medicine (Nano-AIMS), Amrita Vishwa Vidyapeetham, Kochi
- **Prof. V. P. N. Nampoori**, Former Director, International School of Photonics, Cochin University of Science and Technology (CUSAT)
- Prof. (Dr.) N. Suresh Nair, Kerala Veterinary and Animal Sciences University (KVASU)

Online Discussants:

- **Prof. Mahendra Kavdia**, Wayne State University, USA
- **Dr. Taufia Hussain**, University of Rostock, Germany
- **Prof. N. Sukumar**, Amrita Vishwa Vidyapeetham

Presentations

Mechano-physiology (kinesin) & Cold Plasma

Speaker: **Dr. Allen Lobo**, St. Joseph's University (SJU), Bengaluru

Deliberations: Presented a computational biophysics analysis of the molecular motor kinesin. The study challenged orthodox ATP-driven deterministic "power stroke" models, advancing an alternative mechanism based on distributed electrostatics, non-equilibrium interfacial charge transfers, and stochastic fluctuations driving directed physical translocation.

Vision & Electro-/Neuro-physiology

Speaker: **Prof. Kelath Murali Manoj** (Prof. KMM), Amrita Vishwa Vidyapeetham

Deliberations: Critically evaluated the classical ion-pump proposal for Na/K differential and presented thermodynamic rationale for the distribution of cations. With regard to photoreceptive transduction, demonstrated the infeasibility of the prevailing visual cycle citing eye's vasculature/architecture and oxygen utilization. A new model for neurophysiological signaling through murburn-mediated redox dynamics was given (wherein light falling on the retinoid molecule generated a charged species directly, with minimal

wastage of energy and invoking less sophisticated processes like non-evidenced protein conformational changes), offering alternatives to classical perceptions.

Summary & Deliberations

The session explored the intersection of biophysics, non-equilibrium thermodynamics, and interfacial electrochemistry across three primary domains:

- **Biomechanical Coupling:** Computational assessments demonstrated that cytoskeletal motors can achieve directed transport by harnessing stochastic redox fluctuations and interfacial electrostatic gradients rather than rigid conformational motor-work.
- **Cellular Electrophysiology & Ion Homeostasis:** The murburn interpretation directly challenges the classical pump-and-leak paradigm. Thermodynamic calculations presented during the session demonstrated that total cellular ATP turnover is insufficient to sustain continuous active transport against persistent whole-cell membrane leak currents. Consequently, resting potentials and ion homeostasis were reconceptualized as a matrix- and redox-assisted partitioning system governed by murzyme catalysis and interfacial redox sieving.
- **Photoreception & Sensory Transduction:** The murburn framework departs from the classical phototransduction cascade—which relies strictly on deterministic cis-to-trans retinal isomerization driving conformational GPCR cascades—by proposing that photon capture initiates rapid photo-redox excitation. Akin to carotenoid functions in photosynthesis, this process generates transient DRS within the disc membrane microenvironment to mediate sensory signaling and neuronal excitation directly.

The panel—including online discussants Prof. Mahendra Kavdia, Dr. Taufiq Hussain, and Prof. N. Sukumar—concluded that integrating interfacial redox kinetics with electro-optics provides viable mechanistic alternatives for sensory processing, membrane excitability, and cellular signaling.

Session 5

Microbial/Plant Physiology, Biodiversity & Ecology

Session Chairs:

- **Prof. A. Latha, Dean**, Kerala Agricultural University (KAU)
- **Dr. Anitha Karun**, Former Director, ICAR-Central Plantation Crops Research Institute (ICAR-CPCRI)
- **Prof. (Dr.) N. Suresh Nair**, Kerala Veterinary and Animal Sciences University (KVASU)
- **Prof. P. Venugopal**, Department of Chemistry, University of Calicut

Key Message:

- **Dr. Marco Fiore**, Institute of Biochemistry and Cell Biology (IBBC), CNR, Rome, Italy (Contributed presentation slides)

Presentation

Photosynthesis, Bacterial Motility, Biodiversity & Evolution

Speaker: Prof. Kelath Murali Manoj (Prof. KMM), Amrita Vishwa Vidyapeetham

Deliberations: Extended the murburn paradigm from subcellular biochemistry to organismal and ecological scales. The presentation illustrated how stochastic redox processes and diffusible reactive species inform photosynthetic oxygenesis and photophosphorylation, bacterial flagellar rotation, ecological biodiversity

patterns, and the macro-evolutionary emergence of aerobic systems.

Summary & Deliberations

The session extended the seminar's dialogue to botanical, microbiological, and macro-ecological systems, examining whether unified physical-chemical principles operate across phylogenetic boundaries:

- **Bioenergetics and Motility:** Bacterial flagellar mechanics and plant bioenergetics were re-evaluated through interfacial charge separation and transient redox interactions rather than deterministic mechanical gear-trains or strictly chemiosmotic rotary motors.
- **Ecology and Evolutionary Dynamics:** Biodiversity distributions and habitat adaptations were characterized as macro-level expressions of shared stochastic redox-buffering capacities between organisms and their geochemical niches. Murburn theorization had first started with the pioneering studies on the haloperoxidases first.

Deliberations engaged researchers across computational biology, agricultural sciences, and bioengineering, emphasizing the imperative to move beyond qualitative frameworks by formulating rigorous mathematical models and network simulations capable of testing non-equilibrium redox processes at ecosystem scales.

Valedictory Session

Chief Guest (Online):

Prof. K. V. Venkatesh, Department of Chemical Engineering, Indian Institute of Technology (IIT) Bombay; Founder, MetFlux Company

Session Chair:

Dr. Grinson George, Director, ICAR-Central Marine Fisheries Research Institute (ICAR-CMFRI); Event Chairman

Summary & Deliberations

The conference concluded with the Valedictory Session, reviewing the principal findings, cross-disciplinary debates, and future directions established over the two-day meeting.

Chief Guest Address: Delivering his address online, Prof. K. V. Venkatesh commended the steady theoretical and empirical progress made in the formulation and application of the murburn concept since the inaugural

workshop convened at IIT Bombay in 2023. He highlighted the importance of questioning entrenched scientific dogmas, noting that substantive progress in biology fundamentally requires conceptual shifts and rigorous evaluation of alternative paradigms.

Presidential Remarks: In his concluding remarks as Event Chairman, Dr. Grinson George underlined the necessity of maintaining intellectual openness in modern biosciences. He emphasized that institutions must encourage alternative scientific inquiry and support rigorous experimental protocols to objectively test emerging bioenergetic theories.

Presentation of Merit Certificates

The proceedings concluded with the announcement of Merit/Distinction Certificates awarded to student delegates and research presenters in recognition of academic excellence during technical sessions, oral presentations, and interactive scientific competitions.

Recommendations

The scientific panel discussions, conducted in hybrid mode with active participation from multidisciplinary researchers across India and abroad, put forward the following key recommendations for future research and academic engagement:

- **Integration of computational and experimental approaches:** Combine bioinformatics, high-resolution spectroscopy, kinetic assays, and molecular simulations to rigorously validate the physiological relevance of stochastic, radical-mediated catalytic pathways.
- **Systematic comparison of competing paradigms:** Design robust, quantitative experiments with measurable biochemical and biophysical endpoints capable of directly distinguishing between classical and murburn-based mechanistic predictions.
- **Translational pharmacology and precision medicine:** Incorporate stochastic redox chemistry into pharmacokinetic and pharmacodynamic (PK/PD) frameworks to better capture idiosyncratic metabolic variations, complex drug-drug interactions, and non-linear dose-response behaviors.
- **Interdisciplinary research consortia:** Foster active collaborations spanning computational biology, structural biochemistry, non-equilibrium thermodynamics, systems modelling, and experimental enzymology to test and refine emerging biological paradigms.
- **Academic outreach and pedagogical integration:** Promote critical thinking and awareness of alternative mechanistic frameworks among students and early-career researchers through open-access conference proceedings, specialized workshops, and curricular discussion forums.

Rapporteurs, Session Notes & Appendices:

- **Rapporteurs and Scientific Observers:**
- Dr. Alex George (SRM Medical College Hospital and Research Centre, Chennai), Dr. Lins Simon (Bharata Mata College, Thrikkakara, Ernakulam), and Mr. Rajagopal Muralidharan (St. Joseph's College, Irinjalakuda) served as official rapporteurs and scientific observers across all technical sessions of the seminar.
- **Technical Connectivity Note:**
- Scheduled online expert contributions by Dr. Afsal Manekkathodi (Sultan Qaboos University, Oman) and Prof. Yanyou Wu (Institute of Geochemistry, Chinese Academy of Sciences) could not be connected due to technical transmission disruptions.
- The temporal listing of the actual program is given in Appendix 1.
- **Selected References:** Key publications, foundational literature, and recent papers on the murburn concept cited during the discussions are catalogued in Appendix 2.
- **Video Documentation:** Official video recordings and archival documentation of the proceedings are detailed in Appendix 3.
- **Photo Documentation:** Photographic records documenting the inaugural ceremony, technical deliberations, interactive sessions, and valedictory function are compiled in Appendix 4.
- **Press Coverage:** Some salient snapshots of newspaper and internet coverage are given in Appendix 5.
- Details of the speakers on murburn concept are given in Appendix 6.

Appendix 1

Program of MCDF2026

Murburn Concept Discussion Forum (Aug 3-4, 2026)

August 3, Monday Registration from 8:30 AM

INAUGURAL FUNCTION

3rd Aug Monday: 10:15 AM

Welcome	: Dr. Grinson George Director, ICAR-CMFRI	Presidential Address	: Prof. V. Siva Kumar President, SSMK
About the programme	: Dr. K. Muralidharan Programme Coordinator SSMK	Personal Message	: Prof. Kelath Murali Manoj Amrita Vishwa Vidyapeetham
Guest of Honour 1	: Shri. Vivekananda Pai Secretary General, VIBHA	Felicitation of KMM	: Dr. Prof. VPN Nampoori (CUSAT) Citation by SSMK
Guest of Honour 2	: Prof. Dr. Damodaran Vasudevan Dean- Medical Research, Amrita, Author-Textbook of Med. Bioch. : Prof. P. Ravindran VC, Calicut University	Chief Guest's Inaugural Talk	: Prof. P. Raveendran VC, Calicut University
		Organizers' Vote of Thanks	: Dr. Ashish Khandelwal General Convenor

Session 1: KEYNOTE ON MURBURN

3rd Aug Monday 11:45 AM

Chairs & Discussants	: Prof. P. Raveendran VC, Calicut University : Prof. Dr. Damodaran Vasudevan, Dean, Med. Research, Amrita : Dr. Grinson George Director, ICAR-CMFRI	Joining online	: Prof. P. K. Babu (USA) Phys. Chem., West. Illinois Univ. : Dr. Marko Vitas (Slovenia) EU Agency for Medical Products. : Prof. P. Rajendran (Dean) Central University Kasaragode
Speaker	: Prof. Kelath Murali Manoj Promulgator, Murburn Concept How do we live and why do we die? Murburn Concept!		

Session 2: Biochemistry, Bioenergetics & Biomechanisms

3rd Aug Monday: 2:30 PM

Chairs & Discussants : Prof. P. Venugopal
Chemistry, Calicut
University
: Dr. N. H. Mohan (online)
Director, ICAR-NBAGR
: Mr. Vivian David Jacob,
Amrita
Why is cyanide acutely
toxic?

Speakers

: Prof. Prasad Burra, KLEF,
Guntur
Mucus, a murburn
moderator

: Dr. Vinith Rejathalal,
Amrita VV
Algorithmic tracing of
murzymes
Joining online : Dr. G. R. Sridhar, FNAE,
FRCP
Director, Diabetes Res.
Ins., Vizag

Evening: Open-Quiz on proceedings with spot prizes! (Coordination- Dr. ARS Menon, SSMK)

Open-ended Interactions with Speakers

Session 3: Drug Metabolism, Dose Responses & Medicine

4th Aug Tuesday: 9 AM

Chairs & Discussants : Prof. Sabitha M. Principal,
Amrita Col. Pharmacy
: Dr. G. R. Sridhar, FNAE,
FRCP
Director, Diabetes Res.
Ins., Vizag
: Prof. (Dr.) N. Suresh Nair
KVASU
: Dr. Ashish Khandelwal
Guntur
Senior Scientist, CMFRI

Speakers : Dr. Abhinav Parashar,
Charusat
CYPs & Dose responses
: Dr. Daniel Andrew LDH
& Cyclooxygenase
Key Message : Prof. George Chaldakov
(Bulg.)
Medical University, Varna
Online Message : Dr. Laurent Jaeken
(Belgium)
K de G Hogeschool,
Antwerp

Vision & Electro/Neuro/Mechano-physiology

4th Aug Tuesday: 11:15 AM

Chairs & Discussants	: Dr. Krishnakumar Menon Nano-AIMS, Amrita VV, Kochi	Speakers	: Prof. Kelath Murali Manoj, AVV Vision & Electro-/Neuro- physio.
	: Prof. VPN Nampoori (Ex-Direct.) Int. Sch. Photonics, CUSAT	Joining online	: Prof. Mahendra Kavdia (USA) Wayne State, USA
	: Prof. (Dr.) N. Suresh Nair KVASU		: Dr. Taufia Hussain (Germany) University of Rostock
Speaker	: Dr. Allen Lobo (SJU, Bengaluru) Mechano-physio. & Cold Plasma		: Prof. N. Sukumar Amrita Vishwa Vidyapeetham
		Key message (Online)	: Prof. Hirohisa Tamagawa Gifu University, Japan

Microbial/Plant Physiology & Ecology

4th Aug Tuesday: 2:50 PM

Key Message (ppt sent)	: Dr. Marco Fiore CNRS-Rome, Italy	Speakers	: Kelath Murali Manoj (AVV) Photosynthesis, Bacterial motility, Biodiversity & Evolution
Chairs & Discussants	: Prof. A. Latha Dean, KAU	Online (failed connection)	: Dr. Afsal Manekkathodi (Oman) (Sultan Qaboos University)
	: Prof. (Dr.) N. Suresh Nair KVASU		: Dr. Taufia Hussain (Germany) University of Rostock
	: Dr. Anitha Karun Ex-Director, ICAR-CPCRI		
	: Prof. (Dr.) N. Suresh Nair KVASU		
	: Prof. P. Venugopal Chemistry, Calicut University		

Valedictory Function

4:30 PM

Expert Online

: Prof. K. V. Venkatesh
IIT Mumbai, Founder-
MetFlux

Chief Functionary

: Dr. Grinson George
Director, CMFRI; Event-
Chairman

Common panel of Discussants for all sessions/proceedings

- Prof. P. Venugopal
Calicut University
- Dr. Alex George
SRMMCHRC, Chennai
- Dr. Lins Simon
Bharata Mata College, Ernakulam
- Mr. Rajagopal Muralidharan
St. Joseph's College, Irinjalakkuda

Appendix 2

Select references for murburn applications in various fields

A dozen applications of murburn concept to explain various facets of life – August 2025

No. *	System/Field	Classical model	Advantage(s) of murburn model	Author/PI's publications ⁵
1	Peroxidase/Catalase (peroxisomes; cycling of lignocellulosics and halogenated organics)	BROS - Compound I (LaK)	Explains substrate diversity and inhibition; modulation by diverse molecules, practically diffusion-limited catalytic ET.	BBA 2006 BBRC 2012 Biochemistry 2008 PLoS One 2010 Biochimie 2016
2	Cyclooxygenase (inflammation; immunology)	BROS - Compound I (LaK)	Explains substrate diversity and variable products; modulation by diverse molecules.	Biomed Rev 2020 Biomed Rev 2024
3	Lactate dehydrogenase (LDH: How is the reaction viable for lactate to pyruvate in the liver?)	Reversible enzyme (LaK)	Reasons why lactate has to go into mitochondria or be taken to liver for using the energy equivalents.	J Cell Physiol 2022 AIP Adv 2023a
4	Hemoglobin in RBC (Viability of erythrocytes for 3-4 months sans nucleus and mitochondria)	No explanations	Proposes the first rationale for prolonged viability of erythrocytes in the absence of nucleus and mitochondria.	JBSD 2022 AIP Adv 2023a
5	Drug/Xenobiotic metabolism in liver (how cells deal with unknown molecules)	P450cam (LaK)	Explains diversity of CYPs (cytochrome P450), promiscuity of CPR (CYP-reductase) and Cyt. bs, and diversity of substrates	Frontiers Pharm 2016 Curr Drug Metab 2021 BBA 2022 AIP Adv 2023a
6	Mitochondrial respiration (ATP-synthesis and thermogenesis)	Electron transport chain (ETC) + CRAS	Thermodynamically viable rationale for oxidative phosphorylation and heat production in cells. Primary drive for life!	ABB 2018 PBMB 2021 BBA 2022 AIP Adv 2023a
7	Light reaction of photosynthesis (radiation to reaction logic)	Z-scheme & Kok-Joliot cycle + CRAS	Discrediting the Z-scheme model, explained the roles of photosystems and antenna complexes.	JBSD 2022 a-b BBA 2022 J Cell Physiol 2023
8	Retinal photoreception (transduction of light radiation to electrical signal)	Retinal cycle (11cis to all trans model)	Details direct role for oxygen in photoreception, explaining eye structure and efficient photon-processing.	Biomed Rev 2020 J Cell Physiol 2022 BBA 2022 AIP Adv 2023b
9	Na⁺/K⁺ ion-differential & electrochemical signaling (electrophysiology)	Classical Membrane Pump Theory (CMPT)	Brings the first electronic model for electrophysiology; more viable/tangible than a merely ion-centric view. (CMPT fails in plants!)	J Cell Physiol 2022a-b J Cell Physiol 2023 AIP Adv 2023b
10	Bacterial flagella-aided motility (mechanical work)	Berg's rotary model	Conclusively refuting the rotary model, water-ejection based propulsion was reasoned.	JBSD 2022 AIP Adv 2023b Biomed Rev 2024
11	Unusual dose responses (idiosyncrasies and hormesis), photodynamic therapy, parallel medicine, etc.	No explanations	Reasons out non-genetic interpersonal variability, enhanced activity at lower doses in some cases, "hot-food",	In Silico Pharm 2016 Dose Response 2018 Biochimie 2016 J Cell Physiol 2023 Biomed Rev 2024
12	PCHEMS to PTMs, OSTeOL to Biological intelligence, Chemico-physical coherence, Networking of electro-chemically disconnected systems, etc.	No equivalent	In conjunction with the central dogma, brings key aspects of molecular and macroscopic cellular activities under a unified perspective.	AIP Adv 2023a-b J Cell Physiol 2023 J Cell Physiol 2024 Biomed Rev 2024 Int J Mol Sci 2025

Abbreviations: BROS- Bound reactive oxygen species; LaK- lock and key enzyme model; ETC-CRAS – electron transport chain & chemiosmotic rotary ATP synthesis; PCHEMS – Powering, coherence, homeostasis, electro-mechanical and sensing-response activities; PTM: post-translational modifications; OSTeOL – origin, sustenance, termination and evolution of life;

⁵ KM Manoj's group's works as available from Google Scholar

* Each field above has dozens of experimental/theoretical points refuting classical models & supporting murburn model.

Update (math-works) on murburn publications is at Prof. KMM's Google Scholar site:

https://scholar.google.com/citations?hl=en&user=gVbtBHYAAAAJ&view_op=list_works&sortby=pubdate

Appendix 3

Video Recordings

Session	Link
Complete proceedings	Day 1: https://www.youtube.com/watch?v=vDikidNBN2o&t=6701s Day 2a: https://www.youtube.com/watch?v=yqpHW3FhXzY&t=7s Day 2b: https://www.youtube.com/watch?v=-SRIOFikm-g&t=2922s
Inaugural session	https://www.youtube.com/watch?v=wa5nr5ltX_Y&t=3141s
Session 1 (Keynote)	https://www.youtube.com/watch?v=QG-E5kPkkkk&t=4154s
Session 2:	
Vivian David Jacob	https://www.youtube.com/watch?v=ZluXtnV8Pt4&t=174s
VLS Prasad Burra	https://www.youtube.com/watch?v=0Q0D_yRWzW4
Dr. Vinith Rejathalal	https://www.youtube.com/watch?v=d45OGgfVaqc&t=614s
Discussion	https://www.youtube.com/watch?v=h29DVtDWNBs
Session 3	
Dr. GR Sridhar	https://www.youtube.com/watch?v=RZghygnkjH8&t=218s
Dr. Abhinav Parashar	https://www.youtube.com/watch?v=pcczUoBvDSE
Dr. Daniel Andrew	https://www.youtube.com/watch?v=xYolXpvP30I
Dr. Laurent Jaeken	https://www.youtube.com/watch?v=oMZMBI6M8UM&t=2s
Session 4	
Dr. Alan Lobo	https://www.youtube.com/watch?v=2LO104utmdg
Prof. KMM	https://www.youtube.com/watch?v=sNzGB_FaRWI
Session 5	
Prof. KMM	https://www.youtube.com/watch?v=6QzBhUBrYEA&t=4795s
Valedictory	https://www.youtube.com/watch?v=sJN81uP-Q_Q&t=1353s
Impressions	https://www.youtube.com/watch?v=9rxUR1bVmEc

Appendix 4

Select Photographs



Inaugural session



Section of the audience



Section of the audience



Dr Grinson George welcoming the gathering



Dr. K.Muralidharan on programme details



Prof. P. Raveendran giving inaugural address



Shir. Vivekananda Pai, Guest of Honour



Prof. Dr. D. Vasudevan as Guest of Honour



Prof. V. Siva Kumar – presidential address



Prof. V.P.N. Nampoori felicitating Prof. KMM



Dr. Ashish Khandelwal
proposed Vote of thanks



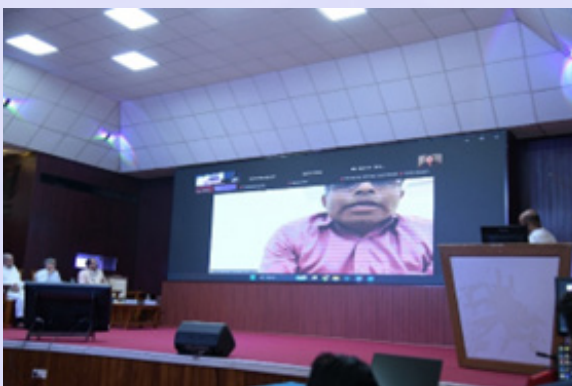
Keynote address by KMM



Prof. P. K. Babu (Western Illinois University)



Dr. Marko Vitas (Slovenia)



Dr. P. Rajendran – discussant (online)



Vivian David Jaco speaks on cyanide toxicity



Prof. P. Burra speaks on mucopolysaccharides



Dr. V. Rejathalal on murburn algorithm logic



Dr. Mohanan (Chair) elaborating on murburn



Students participating at the end of Day 1



Dr. A. Parashar speaks on drug metabolism



Dr. D.A. Gideon speaks on LXH & COX



Prof. Sabitha and Suresh Chairing session



Dr. Allen Lobo lectures on kinesin



Dr. Krishnakumar Menon & Prof. V.P.N. Nampoori conducting session on physiology



A section of the participants



Prof KMM delivering the lecture on vision



Dr. M Kavdia, Dr. T. Hussain interacting



Prof. A. Latha & Dr. Anitha Karun conducting the session on microbial/plant physiology

Appendix 5

Salient News/Media/Internet Coverage



എറണാകുളം സി.എ.എഫ്.ആർ.ഐയിൽ ആരംഭിച്ച 'മൂർബ്ബേൺ' സിദ്ധാന്തം ദേശീയ ചർച്ച കാലിക്കറ്റ് സർവകലാശാല വൈസ് ചാൻസലർ ഡോ. പി. രവീന്ദ്രൻ ഉദ്ഘാടനം ചെയ്യുന്നു.

'മൂർബ്ബേൺ' ശിൽപശാല തുടങ്ങി

കൊച്ചി • കോശങ്ങളിലെ ജൈവ പ്രക്രിയകളെ കുറിച്ചുള്ള പുതിയ ശാസ്ത്രീയ നിരീക്ഷണമായ 'മൂർബ്ബേൺ' സിദ്ധാന്തത്തെക്കുറിച്ച് സി.എ.എഫ്.ആർ.ഐയിൽ ദേശീയ ശിൽപശാലയ്ക്കു തുടക്കമായി.

കാലിക്കറ്റ് സർവകലാശാല വൈസ് ചാൻസലർ ഡോ. പി. രവീന്ദ്രൻ ഉദ്ഘാടനം ചെയ്തു.

സന്ദേശി ശാസ്ത്ര പ്രസ്ഥാനവും അമൃത വിശ്വവിദ്യാപീഠവും ചേർന്നാണ് പരിപാടി സംഘടിപ്പിക്കുന്നത്.

സന്ദേശി ശാസ്ത്ര പ്രസ്ഥാനം പ്രസിഡന്റ് പ്രഫ. വി. ശിവകുമാർ അധ്യക്ഷത വഹിച്ചു.

മൂർബ്ബേൺ സിദ്ധാന്തവുമായി ബന്ധപ്പെട്ട ഗവേഷണങ്ങൾക്കു പ്രഫ. കേലത്ത് മുരളി മനോജിനെ സന്ദേശി ശാസ്ത്ര പ്രസ്ഥാനം ആദരിച്ചു.

സി.എ.എഫ്.ആർ.ഐ ഡയറക്ടർ ഡോ. ഗ്രീൻസൺ ജോർജ്ജ്, അമൃത വിശ്വവിദ്യാപീഠം മെഡിക്കൽ റിസർച്ച് ഡീൻ പ്രഫ. ഡി. വാസുദേവൻ, വിജ്ഞാൻ ഭാരതി സെക്രട്ടറി ജനറൽ വിവേകാനന്ദ പൈ, പ്രഫ. കേലത്ത് മുരളി മനോജ്, ഡോ. കെ. മുരളീധരൻ, ഡോ. ആശിഷ് ഖണ്ടേൽവാൽ തുടങ്ങിയവർ പ്രസംഗിച്ചു.

മറീൻ ഫിഷറീസ് മേഖലയിലെ സയുക്ത ഗവേഷണങ്ങൾക്കു സി.എ.എഫ്.ആർ.ഐയും എൻവയൺമെന്റൽ ഡിഫൻസ് ഇന്ത്യ ഫൗണ്ടേഷനും തമ്മിലുള്ള ധാരണാപത്രം ഒപ്പുവച്ചു.

കടൽപായൽ ഉപയോഗിച്ച് സി.എ.എഫ്.ആർ.ഐ നിർമ്മിച്ച 'കടൽമീൻ' സീവീഡ് സോപ്പും സി.എ.എഫ്.ആർ.ഐയുടെ ശാസ്ത്ര പ്രസിദ്ധീകരണവും ചടങ്ങിൽ പ്രകാശനം ചെയ്തു.



■ സിഎംഎഫ്ആർഐയിൽ ആരംഭിച്ച മുർബ്ബൺ സിദ്ധാന്തത്തെക്കുറിച്ചുള്ള ദേശീയ ചർച്ച കാലിക്കറ്റ് സർവകലാശാല വൈസ് ചാൻസലർ ഡോ. പി. രവീന്ദ്രൻ ഉദ്ഘാടനം ചെയ്യുന്നു.

മുർബ്ബൺ ശാസ്ത്ര ചർച്ചക്ക് തുടക്കമായി

കൊച്ചി: സ്വദേശി ശാസ്ത്ര പ്രസ്ഥാനവും അമൃത വിശ്വവിദ്യാപീഠവും സംയുക്തമായി സംഘടിപ്പിക്കുന്ന മുർബ്ബൺ സിദ്ധാന്തത്തെക്കുറിച്ചുള്ള ദേശീയ ചർച്ച സിഎംഎഫ്ആർഐയിൽ തുടങ്ങി. കാലിക്കറ്റ് സർവകലാശാല വൈസ് ചാൻസലർ ഡോ. പി. രവീന്ദ്രൻ ഉദ്ഘാടനം ചെയ്തു. സ്വദേശി ശാസ്ത്ര പ്രസ്ഥാനം പ്രസിഡന്റ് പ്രൊഫ. വി. ശിവകുമാർ അധ്യക്ഷത വഹിച്ചു. മുർബ്ബൺ സിദ്ധാന്തവുമായി ബന്ധപ്പെട്ട ഗവേഷണപ്രവർത്തനങ്ങൾക്ക് പ്രൊഫ. കേലത്ത് മുരളി മനോജിനെ സ്വദേശി ശാസ്ത്ര പ്രസ്ഥാനം ചടങ്ങിൽ ആദരിച്ചു. മറൈൻ ഫിഷറീസ് മേഖലയിലെ സംയുക്ത ഗവേഷണങ്ങൾക്കായി സിഎംഎഫ്ആർഐയും എൻവയോൺമെന്റൽ ഡിഫൻസ് ഇന്ത്യ ഫൗണ്ടേഷനും (ഇഡിഐഎഫ്) തമ്മിലുള്ള ധാരണാപത്രം ചടങ്ങിൽ കൈമാറി. കടൽ പായൽ ഉപയോഗിച്ച് സിഎംഎഫ്ആർഐ നിർമ്മിച്ച കടൽമീൻ സീവീഡ് സോപ്പും സിഎംഎഫ്ആർഐയുടെ ശാസ്ത്ര പ്രസിദ്ധീകരണവും ചടങ്ങിൽ പ്രകാശനം ചെയ്തു.

സിഎംഎഫ്ആർഐ ഡയറക്ടർ ഡോ. ഗ്രീൻസൺ ജോർജ്ജ്, അമൃത വിശ്വവിദ്യാപീഠം മെഡിക്കൽ റിസർച്ച് ഡീൻ പ്രൊഫ. ഡി. വാസുദേവൻ, വിജ്ഞാൻ ഭാരതി സെക്രട്ടറി ജനറൽ വിവേകാനന്ദ പൈ, പ്രൊഫ. കേലത്ത് മുരളി മനോജ്, ഡോ. കെ. മുരളീധരൻ, ഡോ. ആശിഷ് ഖണ്ടേൽവാൽ തുടങ്ങിയവർ സംസാരിച്ചു.

ഹിന്ദു മതത്തിന്റെയും സാമൂഹികതയുടെയും പശ്ചാത്താപം സിദ്ധാന്തം പ്രകാശനം ചെയ്തു. സിഎംഎഫ്ആർഐ ഡയറക്ടർ ഡോ. ഗ്രീൻസൺ ജോർജ്ജ്, അമൃത വിശ്വവിദ്യാപീഠം മെഡിക്കൽ റിസർച്ച് ഡീൻ പ്രൊഫ. ഡി. വാസുദേവൻ, വിജ്ഞാൻ ഭാരതി സെക്രട്ടറി ജനറൽ വിവേകാനന്ദ പൈ, പ്രൊഫ. കേലത്ത് മുരളി മനോജ്, ഡോ. കെ. മുരളീധരൻ, ഡോ. ആശിഷ് ഖണ്ടേൽവാൽ തുടങ്ങിയവർ സംസാരിച്ചു.

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[in](#)

Special Service and Features

Experts to deliberate on Murburn concept at national brainstorming forum

Posted On: 28 JUL 2026 7:04PM by PIB Thiruvananthapuram

Kochi: Scientists, academicians and researchers will converge in Kochi for a national brainstorming forum on August 3 and 4 to deliberate on the Murburn concept, an emerging scientific framework that seeks to explain several fundamental biological processes through controlled radical chemistry within living cells. Organised by the Swadeshi Science Movement Kerala (Vijnana Bharati), the meet will be held at ICAR-Central Marine Fisheries Research Institute (CMFRI).

The forum will feature keynote lectures and panel discussions by experts from diverse fields, including Calicut University Vice Chancellor Dr P Raveendran.

The term Murburn, derived from "mured burning", refers to a mild, controlled form of oxidative chemistry occurring within the confined spaces of living cells. This concept proposes that highly reactive, short-lived reactive radicals formed from oxygen and other substances are not merely harmful wastes; in controlled amounts, they are important working agents of life.



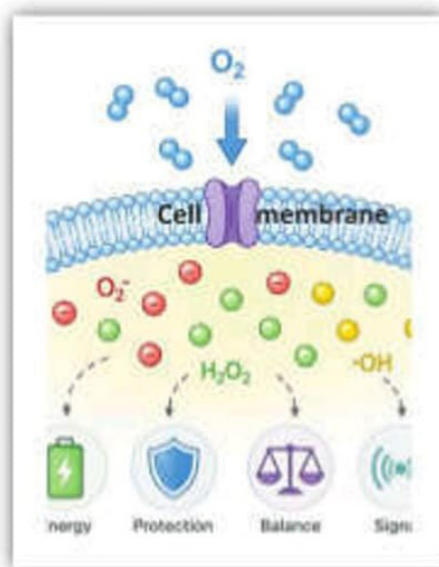
National science forum to discuss 'Murburn concept' at CMFRI

EXPRESS NEWS SERVICE

SCIENTISTS, academicians and researchers will converge in Kochi for a national brainstorming forum on August 3 and 4 to deliberate on the Murburn concept, an emerging scientific framework that seeks to explain several fundamental biological processes through controlled radical chemistry within living cells. Organised by the Swadeshi Science Movement Kerala (Vijnana Bharati) with the support of Amrita Vishwa Vidyapeetham, the meet will be held at ICAR-Central Marine Fisheries Research Institute (CMFRI).

The forum will feature keynote lectures and panel discussions by experts from diverse fields, including Calicut University vice-chancellor Dr P Raveendran.

The term 'murburn', derived from "mured burning", refers to a mild, controlled form of oxidative chemistry occurring within the confined spaces of living cells. This



concept proposes that highly reactive, short-lived radicals formed from oxygen and other substances are not merely harmful wastes — in controlled amounts, they are important working agents of life.

Discussion will be held for critical evaluation of this concept and exploring its potential applications across biology, biochemistry, medicine and related disciplines.

Interested participants may register on or before July 30. Phone: 9562911181.

സി.എം.എഫ്.ആർ.ഐ യിൽ 'മൂർബ്ബൺ' ശാസ്ത്ര ചർച്ചക്ക് തുടക്കമായി

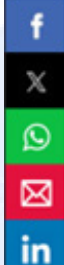


By News Desk 10 03/08/2026

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cdn.pathanamthittamedia.com/wp-content/uploads/2026/08/murburn.jpg



Special Service and Features

Calicut University VC opens scientific discussion on Murburn concept

Posted On: 03 AUG 2026 5:27PM by PIB Thiruvananthapuram

Kochi: A two-day national scientific discussion on the Murburn concept began at ICAR-Central Marine Fisheries Research Institute (CMFRI) on Monday, highlighting the need for continuous inquiry and critical debate for refining scientific knowledge.

Leading scientists, academicians and researchers who are participating in the meet said that empirical data, solid evidence and scientific validation remain the foundation of any scientific principle.



NEWS

മൂർബ്ബേൺ സിദ്ധാന്തത്തെക്കുറിച്ച് ദേശീയ ചർച്ച

28/07/2026 05:41 PM IST

കൈക്കൽ വർഗ്ഗീസ് ചെങ്ങാടക്കരി

മൂർബ്ബേൺ സിദ്ധാന്തത്തെക്കുറിച്ച് ദേശീയ ചർച്ച

കൊച്ചി: കോശങ്ങളിലെ ജൈവ പ്രക്രിയകളെക്കുറിച്ചുള്ള പുതിയ ശാസ്ത്രീയ നിരീക്ഷണമായ 'മൂർബ്ബേൺ' സിദ്ധാന്തത്തെക്കുറിച്ച് കൊച്ചിയിൽ ദേശീയ ചർച്ച സംഘടിപ്പിക്കുന്നു. സ്വദേശി ശാസ്ത്ര പ്രസ്ഥാനം അമൃത വിശ്വവിദ്യാപീഠത്തിന്റെ സഹകരണത്തോടെ സംഘടിപ്പിക്കുന്ന ദ്വിദിന ചർച്ച ആഗസ്റ്റ് മൂന്നിനും നാലിനും സിഎംഎഫ്ആർഐയിൽ നടക്കും.

ശരീര കോശങ്ങൾക്കുള്ളിൽ നടക്കുന്ന നേരിയ തോതിലുള്ള രാസപ്രവർത്തനങ്ങളെ അടിസ്ഥാനമാക്കിയുള്ളതാണ് മൂർബ്ബേൺ സിദ്ധാന്തം. കോശങ്ങളിലെ ഓക്സിജന്റെ സാന്നിധ്യത്തിൽ ഉണ്ടാകുന്ന ചില ഘടകങ്ങൾ ജീവന്റെ നിലനിൽപ്പിന് നിയന്ത്രിത അളവിൽ അത്യാവശ്യമാണെന്ന് നിരീക്ഷിക്കുന്നതാണ് ഈ സിദ്ധാന്തം. ശാസത്രജ്ഞർ, സർവകലാശാല അധ്യാപകർ, ഗവേഷകർ, വിദ്യാർത്ഥികൾ എന്നിവർ ചർച്ചയിൽ പങ്കെടുക്കും. മൂർബ്ബേൺ സിദ്ധാന്തത്തെ സൂക്ഷ്മമായി വിലയിരുത്തുന്ന ചർച്ചകളാണ് നടക്കുക.

മൂർബ്ബേൺ ശാസ്ത്ര ചർച്ചക്ക് തുടക്കമായി

കൊച്ചി: കോശങ്ങളിലെ ജൈവ പ്രക്രിയകളെക്കുറിച്ചുള്ള പുതിയ ശാസ്ത്രീയ നിരീക്ഷണമായ മൂർബ്ബേൺ സിദ്ധാന്തത്തെക്കുറിച്ചുള്ള ദേശീയ ചർച്ച സിഎംഎഫ്ആർഐയിൽ തുടങ്ങി. കാലിക്കറ്റ് സർവകലാശാല വൈസ് ചാൻസലർ ഡോ. പി. രവീന്ദ്രൻ ഉദ്ഘാടനം ചെയ്തു. ശാസ്ത്രീയ അറിവുകളെ കൂടുതൽ പരിഷ്കരിക്കുന്നതിന് നിരന്തരമായ അന്വേഷണങ്ങളും വിമർശനാത്മകമായ സംവാദങ്ങളും അത്യാവശ്യമാണെന്ന് അദ്ദേഹം പറഞ്ഞു. സ്വദേശി ശാസ്ത്ര പ്രസ്ഥാനവും അമൃത വിശ്വവിദ്യാപീഠവും സംയുക്തമായാണ് പരിപാടി സംഘടിപ്പിക്കുന്നത്.

മൂർബ്ബേൺ സിദ്ധാന്തവുമായി ബന്ധപ്പെട്ട ഗവേഷണപ്രവർത്തനങ്ങൾക്ക് പ്രഫ. കേലത്ത് മുരളി മനോജിനെ സ്വദേശി ശാസ്ത്ര പ്രസ്ഥാനം ചടങ്ങിൽ ആദരിച്ചു. മനോജ് ഫിഷറീസ് മേഖലയിലെ സംയുക്ത ഗവേഷണങ്ങൾക്കായി സിഎംഎഫ്ആർഐയും എൻവയോൺമെന്റൽ ഡിഫൻസ് ഇന്ത്യ ഫൗണ്ടേഷനും (ഇഡിഐഎഫ്) തമ്മിലുള്ള ധാരണാപത്രം ചടങ്ങിൽ കൈമാറി. കടൽ പായൽ ഉപയോഗിച്ച് സിഎംഎഫ്ആർഐ നിർമ്മിച്ച കടൽമീൻ സീവീഡ് സോപ്പും സിഎംഎഫ്ആർഐയുടെ ശാസ്ത്ര പ്രസിദ്ധീകരണവും ചടങ്ങിൽ പ്രകാശനം ചെയ്തു. സ്വദേശി ശാസ്ത്ര പ്രസ്ഥാനം പ്രസിഡന്റ് പ്രഫ. വി. ശിവകുമാർ അധ്യക്ഷത വഹിച്ചു. സിഎംഎഫ്ആർഐ ഡയറക്ടർ ഡോ ഗ്രീൻസൺ ജോർജ്ജ് എന്നിവർ പ്രസംഗിച്ചു.

അറിയിപ്പുകൾ

'മൂർബ്ബേൺ' സിദ്ധാന്തം: ചർച്ച നടത്തും

കൊച്ചി • ശരീരകോശങ്ങളിൽ ഊർജ്ജം ഉൽപാദിപ്പിക്കുന്നതിനുള്ള നേരിയ തോതിലുള്ള ജൈവ രാസപ്രവർത്തനങ്ങളെ അടിസ്ഥാനമാക്കുന്ന പുതിയ 'മൂർബ്ബേൺ' സിദ്ധാന്തത്തെ പറ്റി സ്വദേശി ശാസ്ത്ര പ്രസ്ഥാനം അമൃത വിശ്വവിദ്യാപീഠം എന്നിവർ സംഘടിപ്പിക്കുന്ന ചർച്ച ഓഗസ്റ്റ് 3,4 തീയതികളിൽ സിഎംഎഫ്ആർഐയിൽ നടക്കും. 30നു മുന്നപ് റജിസ്ട്രർ ചെയ്യണം. നമ്പർ: 9562911181.

Appendix 6

Contact Addresses of Speakers

Prof. Kelath Murali Manoj

Satyamjayatu: The Science & Ethics Foundation, Shoranur-2, Palakkad Dist. 679122, Kerala.
Email: murman@satyamjayatu.com; Phone: 7012412598

Dr. Daniel Andrew Gideon

Dept. of Biochemistry, St. Joseph's University, Shanti Nagar, Bengaluru- 560027
Email: Daniel.gideon@sju.edu.in; Phone: 9952626080

Dr. Abhinav Parashar

Dept. of Biological Sciences, PDPIAS, CHARUSAT, Changa, Gujarat-388421
Email: abhinavparashar.as@charusat.ac.in; Phone: 8072939470

Vivian David Jacob

PhD Scholar, School of AI, Amrita Vishwa Vidyapeetham, Coimbatore, TN-641112
Email: viviandavid@gmail.com; Phone: 9884929355

Dr. Allen Lobo

Dept. of Physics, St. Joseph's University, Shanti Nagar, Bengaluru- 560027
Email: allen.lobo@sju.edu.in; Phone: 9031953805

Prof. VLS Prasad Burra

Dept. of Biotechnology & CARISBD, KLEF University, Guntur, AP-522502
Email: pburra@kluniversity.in; Phone: 9810655546





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