Sri Lanka Association for Laboratory Animal Science

SLALAS

PROCEEDINGS OF 13TH ANNUAL SCIENTIFIC SESSIONS AND INTERNATIONAL CONFERENCE 2025/2026

Ethics, Collaboration & Popularization: Shaping Future of Laboratory Animal Research

24th & 25th January 2026

@ Renuka City Hotel Colombo, Sri Lanka

slalas.lk

SRI LANKA ASSOCIATION FOR LABORATORY ANIMAL SCIENCE

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"Ethics, Collaboration and Popularization: Shaping the Future of Animal Research"

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SRI LANKA ASSOCIATION FOR LABORATORY ANIMAL SCIENCE

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Dr. Kalpani Ratnayake

Prof. Mangala Gunatilake

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CONTENT

MESSAGE FROM THE CHIEF GUEST

It is a great honour to be the Chief Guest at the 13th Annual Scientific Sessions of the Sri Lanka Association for Laboratory Animal Science. I commend the Association for its continued commitment to promoting high standards in laboratory animal science, which form a critical foundation for biomedical research and public health.

As Sri Lanka continues to strengthen its research capacity, there is a critical need to further integrate laboratory animal science into national priorities in infectious diseases, non-communicable diseases, and emerging health threats. Building local expertise, fostering multidisciplinary collaboration, and promoting transparent and ethical research practices will be essential for generating knowledge that is both globally relevant and locally impactful.

I am confident that the discussions and scientific exchange at this meeting will stimulate new ideas, partnerships, and directions for the field. I wish the Sri Lanka Association for Laboratory Animal Science every success in its endeavours and hope that these sessions will inspire continued excellence in research that ultimately serves both science and society.

Prof. Neelika Malavige
Department of Immunology and Molecular Medicine,
Faculty of Medical Sciences, University of Sri Jayewardenepura

MESSAGE FROM THE GUEST OF HONOUR

It is with a great pleasure that I join with you at the Inauguration of the 13th Scientific Sessions and International Conference of the Sri Lanka Association for Laboratory Animal Science (SLALAS). I wish to extend my sincere appreciation to SLALAS for organizing this important scientific forum, which brings together expertise from across disciplines, institutions, and borders.

Laboratory animal science occupies a unique and indispensable position in modern biomedical research. They play a vital role in the journey from the development of vaccines and lifesaving medicines to advances in surgery, toxicology, nutrition, and public health and many more. Responsible use of animal models has contributed profoundly to improvements in human and animal health worldwide. SLALAS has made meaningful contributions to these global scientific endeavours, and this conference reflects that commitment. Today, laboratory animal science is no longer viewed simply as a technical support discipline. It is recognized as a scientific field**,** grounded in ethics, welfare science, genetics, pathology, and regulatory frameworks. The work you do ensures that biomedical research is not only effective, but also credible, reproducible, and humane.

As Minister of Health, I wish to emphasize that ethical responsibility lies at the heart of all health research. The principles of the 3Rs - Replacement, Reduction, and Refinement, are now established as international standards. Sri Lanka has taken commendable steps in this direction, and we should not forget that organizations such as SLALAS have played a pivotal role in promoting ethical review mechanisms, good laboratory practice, and professional training. In an era where science is advancing at unprecedented speed through genomics, artificial intelligence, precision medicine, and biotechnology the role of laboratory animal science is also evolving. Non-

mammalian models, alternative methods, and advanced in vivo and ex vivo systems are increasingly complementing traditional approaches. These innovations allow us to reduce animal use while increasing scientific value**.**

Another important dimension we must recognize is the relevance of laboratory animal science to national health priorities. Sri Lanka continues to face challenges such as non-communicable diseases, emerging infections, antimicrobial resistance, cancer, metabolic disorders, and environmental health threats. Addressing these issues requires strong translational research, that moves efficiently from laboratory to clinic, and laboratory animal science remains a critical bridge in that process. I am particularly encouraged by the growing interdisciplinary nature of research in Sri Lanka, including work in drug discovery, immunology, neuroscience, nutrition, and toxicology. Emerging areas such as biodiversity-based therapeutics, and One Health approaches highlight how our unique natural resources and scientific talent can contribute to global knowledge while addressing local needs. At the same time, we must acknowledge our responsibility toward capacity building. Developing skilled laboratory animal scientists, veterinarians, technologists, and ethics committee members is essential for sustaining high research standards. The Ministry of Health recognizes the importance of structured training, accreditation, and continuing professional development, and we look forward to strengthening collaboration with professional bodies, universities, and research institutes in this regard.

International collaboration is another cornerstone of scientific progress. Conferences such as this create opportunities not only to share data, but also to exchange values, experiences, and best practices. I encourage our young researchers and students to engage actively with international experts present here, to ask questions, to challenge ideas, and to build networks that will shape the future of Sri Lankan science. I commend SLALAS for its sustained efforts over the years in advocating ethical standards, improving infrastructure, and fostering a culture of responsibility in animal-based research. The fact that this is the 13th International Conference speaks to the resilience and maturity of the association.

As we inaugurate this conference today, I encourage all participants to use this platform not only to present results, but also to reflect on the future direction of

laboratory animal science, a future that is scientifically recognized ethically sound, environmentally conscious, and socially responsible. As the Ministry of Health, I reaffirm our commitment to supporting ethical biomedical research that advances national health goals and aligns with international standards. I wish this conference every success and hope that the discussions held here will translate into meaningful collaborations, innovative research, and improved health outcomes for our people.

I wish the 13th Scientific Sessions and International Conference 2026, a great success.

Thank you.

Dr. Nalinda Jayatissa
Hon Minister of Health and Mass Media

MESSAGE FROM THE DIRECTOR-MEDICAL RESEARCH INSTITUTE

I am happy to write this message as the Director of the Medical Research Institute (MRI) and one of the primary collaborative partners of the Sri Lanka Association for Laboratory Animal Science (SLALAS). I have observed that SLALAS is taking significant steps to train young undergraduate and postgraduate students from various universities in alternatives to animal testing, as well as humane animal experimentation. Animal experiments are sometimes necessary to understand the aetiology of many unknown diseases, such as chronic kidney disease of unknown aetiology (CKDu). As the leading medical research organization in the country, MRI conducts research related to CKDu by employing both animal experiments and alternative techniques. The findings from our research have been instrumental in addressing the public health issues in the affected regions in the country.

The Animal Centre at MRI is equipped with the latest techniques related to laboratory animal science and has significant potentials for collaborations. As the Director of MRI, I am glad to facilitate their research by supporting the maintenance of existing laboratory animal colonies to meet the future research needs of the country. It is essential to collaborate with other scientific organizations, such as SLALAS and to advocate for the "One Health" concept, as many contemporary health issues are complex and interconnected with animal and environmental factors.

I wish SLALAS great success in all its future activities.

Dr. Upali Karunarathna
Director, Medical Research Institute, Sri Lanka

MESSAGE FROM THE PRESIDENT

It is with great honour that I pen a few words on occasion of the 13th Annual Scientific Sessions and International Conference of the Sri Lanka Association for Laboratory Animal Science (SLALAS).

The last year was quite challenging for us as a country. Despite unforeseen environmental disasters and significant financial challenges that deeply affected, SLALAS remained committed to its mission. Through collective commitment, we continued to move forward with the utmost determination and purpose. I believe the adversities we faced ultimately strengthened our resolve and underscored the importance of unity, adaptability, and resilience.

A notable highlight of this period has been SLALAS's active participation in regional and international scientific platforms, particularly the Asian Federation of Laboratory Animal Science Associations (AFLAS). This engagement enhanced Sri Lanka's vision within the regional laboratory animal science community and facilitated valuable exchanges of knowledge, expertise, and best practices. In parallel, we strengthened collaborations with national and international institutions, professional bodies, and academic partners, thereby promoting interdisciplinary cooperation and capacity building in laboratory animal science.

The theme of this year's conference, **"Ethics, Collaboration, and Popularization: Shaping the Future of Laboratory Animal Research,"** aptly reflects both our vision and the activities undertaken during this tenure. Ethical responsibility remained central to all our initiatives, emphasizing humane practices, regulatory compliance, and a strong culture of care. Collaborations were reinforced through partnerships, joint programs, and regional engagement, while popularization efforts focused on

increasing awareness, education, and panel discussions in laboratory animal science. Collectively, these initiatives demonstrate a strong alignment between our conference theme and the practical outcomes achieved by SLALAS during this period.

I wish to express my sincere appreciation to the Chief Guest and the keynote speaker, Prof. Neelika Malavige, the guest of honour, Dr. Nalinda Jayatissa, Honourable Minister of Health and Mass Media, and other valued guests for gracing this important event. Further, I wish to extent my heartfelt gratitude to the Executive Committee, collaborators, sponsors, abstract presenters, and the participants for their dedication and support. Their collective efforts have been instrumental in advancing the objectives of the association.

I wish you all a productive and fruitful two days of this conference and hope it will strengthen our commitment, emphasizing our theme for ethics, collaboration, and popularization to shape the future of laboratory animal science.

Dr. Varuni Gunathilake
President/ SLALAS - 2025/2026

MESSAGE FROM THE HONORARY SECRETARY

It is with great pleasure that I extend a warm welcome to all participants of the 13th Annual Scientific Sessions and International Conference of the Sri Lanka Association for Laboratory Animal Science (SLALAS). The conference this year is convened under the theme, *"Ethics, Collaboration and Popularization: Shaping the Future of Animal Research."* The theme appropriately reflects the evolving responsibilities of the scientific community in ensuring that animal research is conducted with the highest ethical standards, strengthened through effective collaboration, and communicated transparently to foster public trust and understanding.

Ethical responsibility remains central to all research involving animals and is guided by internationally accepted principles, regulatory frameworks, and the fundamental concept of the 3Rs - Replacement, Reduction, and Refinement. Interdisciplinary and institutional collaboration, which enhances scientific validity, promotes efficient use of resources, and fosters innovation is equally important. Furthermore, the popularization of animal research through effective science communication and public engagement is essential in promoting transparency, societal awareness, and informed decision-making.

On this significant moment, I wish to express my sincere gratitude to our distinguished keynote and invited speakers, as well as all presenters, whose expertise has greatly enriched this scientific programme. I also extend my sincere appreciation to the authors and reviewers for their valuable scholarly contributions. My profound thanks go to our sponsors for their generous and invaluable support to make this event a success. I gratefully acknowledge the members of the Organizing Committee and the Executive Committee for their unwavering dedication and tireless efforts, which were instrumental in upholding the overall success of this event.

Finally, I thank all participants for their active engagement and continued support to SLALAS. It is my earnest hope that the deliberations and collaborations fostered during this conference will inspire ethically driven, accountable research and play a pivotal role in shaping the future of animal research in Sri Lanka and across the global scientific community.

Dr. Anusha Senevirathne
Honorary Secretary/ SLALAS - 2025/2026

13th Annual Scientific Sessions & International Conference of

Sri Lanka Association for Laboratory Animal Science (SLALAS)

At Renuka City Hotel, Colombo, Sri Lanka

January 24th and 25th, 2026

Program of Day 1 (24th January 2026)

Time	Description
8.30 a.m. – 9.00 a.m.	Registration
9.00 a.m. – 9.15 a.m.	Inauguration of the 13th Annual Scientific Sessions & International Conference
9.15 a.m. – 9.25 a.m.	Welcome Address Dr. Varuni Gunathilake Honorary President SLALAS- 2025/2026
9.25 a.m. – 9.30 a.m.	Launching of the e-proceedings of the 13th Annual Scientific Sessions & International Conference (By the Guest of Honor and the Chief Guest)
9.30 a.m. – 9.40 a.m.	Address by the Chief Guest Prof. Neelika Malavige Department of Immunology and Molecular Medicine Faculty of Medical Sciences, University of Sri Jayewardenepura
9.40 a.m. – 9.50 a.m.	Address by the Guest of Honor Dr. Nalinda Jayatissa Minister of Health and Mass Media
9.50 a.m. – 10.00 a.m.	Address by Dr. Upali Karunarathna Director of Medical Research Institute, Sri Lanka
10.00 a.m. – 10.45 a.m.	Presidential Address Dr. Varuni Gunathilake Honorary President SLALAS - 2025/2026
10.45 a.m. – 10.50 a.m.	Felicitation video
10.50 a.m. – 11.00 a.m.	Vote of Thanks Dr. Anusha Senevirathne Honorary Secretary SLALAS - 2025/2026
Closure of the Inauguration Ceremony	
11.00 a.m. – 11.20 a.m.	Morning Tea & Group photograph
11.20 a.m. – 12.05 p.m.	Keynote Address Prof. Neelika Malavige Department of Immunology and Molecular Medicine Faculty of Medical Sciences, University of Sri Jayewardenepura

12.05 p.m. – 12.35 p.m.	Guest Speech 1 Prof. Ashoka Dangolla Department of Veterinary Clinical Sciences Faculty of Veterinary Medicine & Animal Science University of Peradeniya
12.35 p.m. – 1.15 p.m.	Lunch
1.15 p.m. – 1.25 p.m.	Flashback video of SLALAS journey 2025
1.25 p.m. – 1.55 p.m.	Guest Speech 2 Dr. Kalpani Ratnayake Department of Pharmaceutical and Cosmetic Sciences Faculty of Health Sciences CINEC Campus, Malabe
1.55 p.m. – 3.25 p.m.	Scientific Paper Session-I (oral presentations)
3.25 p.m. – 3.55 p.m.	Guest Speech 3 Prof. Vir Vikram Principal cum Director School of Pharmaceutical Sciences CT University, Ludhiana, Punjab, India
3.55 p.m.	Closure of Day 1
7.30 p.m.	Conference Dinner

Program of Day 2 (25th January 2026)

Time	**Description**
9.00 a.m. – 9.30 a.m.	Guest Speech 4 Prof. Pooja Gupta Department of Pharmacology All India School of Medical Sciences New Delhi, India
9.30 a.m. – 10.00 a.m.	Guest Speech 5 Prof. Marcel Frajblat ICLAS General Secretary Federal University of Rio de Janeiro (UFRJ), Brazil
10.00 a.m. – 10.15 a.m.	Tea break
10.15 a.m. – 10.45 a.m.	Guest Speech 6 Prof. Mangala Gunatilake Founding President of SLALAS Department of Physiology Faculty of Medicine, University of Colombo
10.45 a.m. – 11.00 a.m.	Video of sponsors
11.00 a.m. – 11.30 a.m.	Guest Speech 7 Dr. Sachini Amarasekara Department of Zoology and Environment Sciences Faculty of Science, University of Colombo
11.30 a.m. – 11.45 a.m.	Video (sponsor)

11.45 a.m. – 12.30 p.m.	Lunch
12.30 p.m. – 12.45 p.m.	Poster presentation session
12.45 p.m. – 1.15 p.m.	Guest Speech 8 Prof. Kavindra Wijesundara Department of Veterinary Pathobiology Faculty of Veterinary Medicine & Animal Science University of Peradeniya
1.15 p.m. – 1.45 p.m.	Guest Speech 9 Dr. Vijay Pal Singh Honorary President Laboratory Animal Scientists' Association (LASA), India
1.45 p.m. – 2.45 p.m.	Mini workshop by the sponsor: Mr. Himanshu Vashishth
2.45 p.m. – 3.00 p.m.	Tea break
3.00 p.m. – 3.05 p.m.	Announcing of the winners of oratorical competition and the Emeritus Prof. Vera Baumans Award
3.05 p.m. – 3.15 p.m.	Award of certificates for the best oral and best poster presentations
3.15 p.m. – 3.35 p.m.	Vote of thanks Dr. Anusha Senevirathne Honorary Secretary SLALAS 2025/2026
3.35 p.m.	Closure of the 13th Annual Scientific Sessions & International Conference
3.40 p.m. onwards	AGM of SLALAS

SPEAKER PROFILES

KEYNOTE SPEAKER

Prof. Neelika Malavige

Department of Immunology and Molecular Medicine
Faculty of Medical Sciences
University of Sri Jayewardenepura

Prof. Neelika Malavige is a Professor in the Department of Immunology and Molecular Medicine at the University of Sri Jayewardenepura and an Academic Visitor at the Weatherall Institute of Molecular Medicine, University of Oxford. She is also the President-Elect of the International Society for Infectious Diseases.

Prof. Malavige's research focuses on the immunopathogenesis of dengue, including the identification of biomarkers and immune correlates of protection, with a strong emphasis on translating these insights into clinical trials. She previously led the global dengue programme at the Drugs for Neglected Diseases Initiative (DNDi) for two years and continues to contribute her expertise through numerous national and international scientific advisory boards, funding panels, and editorial boards, where she serves as a member or chair. Her other global roles include leading the WHO UNITY studies in Sri Lanka, membership in the WHO Arbovirus Technical Advisory Committee of the SEARO and the co-chair of the WHO dengue target product profile committee.

GUEST SPEAKER

Prof. Ashoka Dangolla

Department of Veterinary Clinical Sciences
Faculty of Veterinary Medicine & Animal Science
University of Peradeniya

Prof. Ashoka Dangolla is a Professor of Veterinary Clinical Science at the University of Peradeniya, Sri Lanka, with an extensive career in teaching, research, policy, and public service. He graduated as a veterinarian in 1989 and completed a Postgraduate Diploma in Finland and a doctoral degree in Denmark. His expertise has been further strengthened through specialized training in parasitology, epidemiology, biostatistics, and Geographic Information Systems (GIS), and by coordinating numerous undergraduate and postgraduate teaching programs.

Prof. Dangolla has taught and examined undergraduate and postgraduate students at both local and international universities, including several faculties of the University of Peradeniya. He has supervised over 20 Master's and doctoral research students, contributing significantly to capacity building in veterinary and animal sciences.

His primary research interest is the health, welfare, and management of captive elephants in Sri Lanka, an area in which he is internationally recognized. He has published more than 25 peer-reviewed international research papers and over 40 abstracts related to elephant health and welfare. Prof. Dangolla coordinated the first formal training program for elephant keepers at the Pinnawala Elephant Orphanage and has since conducted multiple training workshops nationwide.

In addition, Prof. Dangolla has played a major role in addressing human–wildlife conflict, serving on national-level committees and publishing extensively on mitigation strategies. He has delivered three keynote addresses at national professional symposia and has contributed to national policy development through consultancies, including the preparation of the National Strategic Plan to prevent human deaths due to rabies, for the World Health Organization and the Ministry of Health, Sri Lanka.

Prof. Dangolla has secured research funding from national and international agencies, including the Asian Development Bank, the National Research Council, and the Sri Lanka Council for Agricultural Research Policy. His scholarly output includes over 50 international journal publications, more than 140 abstracts, three book chapters, and authorship of two books on elephants and human–animal conflict published in three languages. His contributions have been recognized through multiple Presidential Research Awards and international honours. Beyond academia, he has served in senior leadership roles in university sports administration and undergraduate student discipline, reflecting his broad commitment to higher education and public service.

GUEST SPEAKER

Dr. Kalpani Ratnayake

Department of Cosmetic Sciences
Faculty of Health Sciences
CINEC Campus, Malabe

Dr. Kalpani Ratnayake is the Head and a Senior Lecturer at the Department of Cosmetic Science, Faculty of Health Sciences, CINEC Campus, Sri Lanka. She holds a BSc (Special) in Human Biology and a PhD (2018) from the University of Sri Jayewardenepura. She also earned a MSc in Food and Nutrition from the Postgraduate Institute of Agriculture, University of Peradeniya, a Postgraduate Diploma in Laboratory Animal Sciences from the University of Colombo, and professional training in Ayurvedic beauty product manufacturing, including a Diploma and Certificate from the International Institute of Ceylon Ayurveda.

Her research focuses on value addition to traditional medicine, preclinical evaluation of herbal preparations in managing chronic non-communicable diseases, and development of herbal cosmetic products. She has published extensively in indexed, peer-reviewed journals and presented at national and international scientific forums. Her work has earned numerous awards, including the SLAAS Postgraduate Research Award (2019), the International Award at the 64th Annual Meeting of JALAS (2017), the ESTIV "She Inspires Award" (2024), and recognition under the AFLAS/KALAS Next Generation Academic Exchange Program (2019).

Dr. Ratnayake has held leadership roles as President of the Society for Alternatives to Animal Testing–Sri Lanka (SAAT-SL) and the Sri Lanka Association for Laboratory Animal Science (SLALAS). She currently serves as General Secretary of the Sri Lanka National Chapter of the Organization for Women in Science for the Developing World (SLNC-OWSD) and Joint Secretary of the College of Biochemists of Sri Lanka (CBSL).

GUEST SPEAKER

Prof. Vir Vikram

School of Pharmaceutical Sciences
CT University, Ludhiana, India

Prof. Vir Vikram is a renowned researcher and academician with over 25 years of experience in pharmaceutical education, clinical research, and academic leadership. He has completed his PhD from Baba Farid University of Health Sciences, India, and is currently serving as Professor and Principal, School of Pharmaceutical Sciences, CT University, Ludhiana, Punjab, India.

He possesses extensive expertise in Therapeutics, Pharmacovigilance, Pharmacokinetics and Pharmacodynamics, Clinical Research, Drug Discovery, Toxicology, Drug & Poison Information Services, computerized drug-distribution systems, and pharmacy regulations, and has played a significant role in improving rational drug use and therapeutic outcomes.

Prof. Vikram has received multiple appreciation awards from various academic programs and conferences and was conferred with the “Best Principal Award – 2025” at an International Conference. He has served multiple times as the Chairperson at national and international conferences and has been an invited speaker at several international conferences and workshops held in Malaysia, Taiwan, Dubai, Myanmar, Japan, and many other countries. He is a member of seven international professional societies and actively disseminates academic knowledge through social media platforms such as YouTube.

Prof. Vikram has been actively involved in international student exchange programs with institutions in Switzerland, Nepal, Malaysia, Africa, Egypt, and Sri Lanka, fostering global academic collaboration. Prof. Vikram has published more than 50 research articles in high-impact factor national and international journals, holds 20 patents, contributed multiple book chapters, and authored one book. He has also successfully guided 20 doctoral and over 50 Masters’ students.

GUEST SPEAKER

Prof. Pooja Gupta

Department of Pharmacology
All India School of Medical Sciences
New Delhi, India

Prof. Pooja Gupta is Professor of Pharmacology; Coordinator, AIIMS PvPI/ MvPI centre; Member Secretary, Institute Ethics Subcommittee for SAE in Clinical Trials and Workshop Coordinator, Clinical Research Unit at AIIMS, New Delhi.

She has nearly 20 years of teaching and research experience and has been actively involved in the development of Indian national guidelines such as National List of Essential Medicines, Indian Good Clinical Practices, National Formulary of India, and Pharmacovigilance Program of India.

Her areas of academic and research interests include clinical pharmacology, regulatory pharmacology, pharmacovigilance, bioethics, and oncopharmacology.

Having several years of experience in pharmacovigilance, Prof. Pooja is going to talk about important aspects of its application to veterinary medicine.

GUEST SPEAKER

Prof. Marcel Frajblat

ICLAS General Secretary
Universidade Federal do Rio de Janeiro, Brazil

Prof. Marcel Frajblat graduated in Veterinary Medicine from Universidade Federal Fluminense in 1989. He received a master's degree in Reproductive Physiology in 1996, a PhD in Reproductive Physiology in 2000, and postdoctoral training in Reproductive Biotechnology in 2002 from Cornell University.

Prof. Marcel is currently working as a professor at the Health Sciences Centre of Universidade Federal do Rio de Janeiro (UFRJ). He is an advisor for the Graduate Programs in Morphological Sciences and Biomedical Research, focusing on human and animal assisted reproduction and laboratory animal science. He works in the fields of laboratory animal science, production and cryopreservation of gametes and embryos from rodents, and reproductive physiology.

Prof. Marcel has served as the Coordinator of the Ethics Committee on Animal Use (CEUA) at UFRJ since 2014 and is responsible for the Coordination of Activities with Experimental Biological Models (CAMBE) at UFRJ. He is also the Coordinator of the Laboratory of Innovation in Assisted Reproduction (LIRA) at UFRJ and has been a member of the Board of the Federation of Experimental Biology Societies (FeSBE) since 2015. He is the Secretary General of the International Council for Laboratory Animal Science (ICLAS) and Editor-in-Chief of the Biological Models Research and Technology (BMRT) journal. He has been a member of the National Council for the Control of Animal Experimentation (CONCEA) from 2009 to 2013 and from 2017 to 2021 and served as President of the Brazilian Society for Laboratory Animal Science (SBCAL) from 2007 to 2009.

GUEST SPEAKER

***Vidya Nidhi* Prof. Mangala Gunatilake**

Founding President of SLALAS
Department of Physiology
Faculty of Medicine, University of Colombo

Prof. Mangala Gunatilake is a distinguished and influential figure in the field of laboratory animal science (LAS), affiliated to the Department of Physiology at the Faculty of Medicine, University of Colombo. She made history in 2011 by establishing the first International Certificate course in LAS in the Asian region in collaboration with Utrecht University, The Netherlands, thereby pioneering LAS education in Sri Lanka and setting a standard for future programs.

As the Founding President of the Sri Lanka Association for Laboratory Animal Science (SLALAS), her leadership has been pivotal in advancing the field within the country. She introduced innovative alternative research models, such as the zebrafish embryo model, which have had a transformative effect on research practices in Sri Lanka.

Beyond her role with SLALAS, she is also the Founding President of the Society for Alternatives to Animal Testing in Sri Lanka and is the Founding Director of the 3Rs Centre for LAS, emphasizing the principles of Replacement, Reduction, and Refinement in research methodologies.

Prof. Gunatilake's contributions have not gone unnoticed; she has earned numerous accolades on both national and international stages, highlighting her significant impact and recognition as a leader in laboratory animal science globally. She is the World Veterinary Association Global Animal Welfare Award winner in 2025, ICLAS-AFLAS Outstanding Achievement Award winner in 2025 and the Charles River prize winner selected by the American Association for Laboratory Animal Science in 2022. Her work continues to inspire others in the field and fosters a more ethical and scientifically sound approach to research practices in Sri Lanka and beyond.

GUEST SPEAKER

Dr. Sachini Amarasekara

Centre for Immunology & Molecular Biology
Department of Zoology & Environment Sciences
Faculty of Science
University of Colombo

Dr. Sachini Amarasekara is a biomedical researcher at the Faculty of Science University of Colombo where she is primarily engaged in undergraduate teaching and research. She is an active member of the Sri Lanka Association for Laboratory Animal Science (SLALAS) since 2020 and served as the President for the 2024/2025 tenure, during which steps were taken to introduce mouse reproductive engineering to Sri Lanka. She is also actively involved in promoting laboratory animal ethics and the culture of care across Sri Lankan universities.

Dr. Amarasekara has received multiple international recognitions in the field of Laboratory animal science, including the Asian Federation of Laboratory Animal Scientists (AFLAS) Young Scientist Award (2023, Jeju, South Korea) and the International Centre for Genetic Engineering and Biotechnology (ICGEB) scholarship (2025) for training in genome editing and assisted reproductive technologies in Izmir, Turkey. She represented Sri Lanka at the 17th Chinese Association for Laboratory Animal Science Congress and the AFLAS council meeting in Xian, China and was appointed as one of the Vice Presidents of AFLAS in 2024. She was also invited as a speaker at the AFLAS 2025 congress International Forum, Hangzhou, China. In addition to SLALAS, she plays an active role in professional bodies including the Society of Alternatives for Laboratory Animal Testing and the Sri Lanka Association for the Advancement of Science.

Dr. Amarasekara's research interests are in psoriasis immunogenetics, osteoimmunology, and laboratory animal models for cancer and osteoporosis. She has received multiple awards for research excellence and academic outreach over the years, including recognition from the Faculty of Science, University of Colombo, the Senate of the University of Colombo, and the National Research Council of Sri Lanka.

GUEST SPEAKER

Prof. Kavindra Wijesundara

Department of Veterinary Pathobiology
Faculty of Veterinary Medicine & Animal Science
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Prof. Kavindra Wijesundera is a distinguished veterinary pathologist at the Faculty of Veterinary Medicine and Animal Science, University of Peradeniya. He earned his first degree with the Gold Medal, from the University of Peradeniya and doctoral degree in Veterinary Pathology from Osaka Prefecture University, Japan in 2014, where his pioneering research on macrophage heterogeneity in thioacetamide-induced hepatic fibrosis established him as an authority in liver pathology and molecular disease mechanisms.

His academic career spans nearly two decades, progressing from Assistant Lecturer in 2005 to Professor in veterinary pathology in 2022. He served as an Erasmus Visiting Professor at the University of Padova, Italy, contributing to teaching and collaborative research in comparative and molecular pathology. His research portfolio includes over 20 peer-reviewed publications in international indexed journals, and he possesses strong expertise in immunohistochemistry, confocal microscopy and many more. His work integrates comparative pathology with translational medicine, focusing on macrophage polarization, hepatic fibrosis, and bioactive compounds from Sri Lankan medicinal plants and marine organisms.

Prof. Wijesundera has received numerous prestigious honours, including the Young Investigator Award of the American College of Veterinary Pathologists in 2013, multiple Presidential Awards for Scientific Excellence in Japan and Sri Lanka, and the Japanese Government Scholarship. He has served as the Coordinator of the Internal Quality Assurance Cell, Senior Student Counsellor, and former General Secretary of the Sri Lanka College of Veterinary Surgeons. He actively mentor postgraduate students and promotes international collaboration in veterinary pathology and translational biomedical research**.**

GUEST SPEAKER

Dr. Vijay Pal Singh

Honorary President Laboratory Animal Science Association (LASA), India
PTO, CSIR-Institute of Genomics and Integrative Biology

Dr. Vijay Pal Singh works as a Principal Technical Officer in the CSIR-Institute of Genomics and Integrative Biology (CSIR-IGIB) and Associate Professor in the Academy of Scientific and Innovative Research (AcSIR). Before this assignment, He was Joint Director, Food Safety and Standard Authority of India (FSSAI) and Consultant, WHO-SEAR. He is a Graduate in Veterinary Medicine, a Postgraduate in Dairy Husbandry and milk processing & a Doctorate in Biotechnology.

He is a specialist in Lab Animal Science, Risk assessment and Risk Communication, Anti-Microbial Resistance, Food Safety, Systematic Review, Biosafety and Biosecurity, and Microbiological food safety.

He is the President of the Laboratory Animal Scientist Association (LASA) of India and the Regional Secretary of the International Society of Applied Ethology (ISAE). Auditor of the Organisation for Economic Co-operation and Development (OECD) Good Laboratory Practices (GLP).Also, members of several international and national body notables are Pacific Rim ad hoc specialist –AAALAC International, Diplomate-Indian College of Laboratory Animal Medicine, University link for University Federation of Animal Welfare (UFAW) of India, Consultant, food safety, World Health Organization (W.H.O). Regional Resource Person, World Organization for Animal Health (OIE), Expert member, The Joint FAO/WHO Expert Committee on Food Additives (JECFA).

Dr. Singh has more than two decades of experience in research and policy framing. He has played a pivotal role in conducting 7 international courses in Laboratory Animal Science as part of improving the research being done on lab animals. He has 50 indexed research articles, two books, and five book chapters in indexed journals, along with a vast experience of attending many international courses related to lab animal science and animal welfare.

ABSTRACTS OF SPEAKERS

KEYNOTE ADDRESS

BEYOND SPECIES BOUNDARIES: ADVANCING HUMAN HEALTH THROUGH A ONE HEALTH APPROACH

Neelika Malavige

Professor

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Rapid environmental change, climate warming, increasingly erratic weather patterns, and unprecedented global travel and trade have created conditions that favour the emergence and rapid spread of infectious diseases. Recent flooding events in Sri Lanka and elsewhere highlight how environmental disruption can intensify human–animal–ecosystem interactions, increasing the risk of zoonotic spillover. In parallel, several human pathogens are now recognized to infect animal hosts, where viral adaptation or mutation may occur before re-emerging in humans with enhanced transmissibility or disease severity. Despite these realities, surveillance systems for animal and human infections remain largely fragmented, limiting early detection and coordinated response.

The One Health approach is integrating human, animal, and environmental health. This is no longer optional but essential for safeguarding human health. There urgent need to strengthen One Health research, surveillance, and data-sharing in Sri Lanka, where integrated approaches remain limited despite increasing vulnerability to emerging infections. Furthermore, it is important to define the role of laboratory animal science within the One Health framework, particularly in drug and vaccine development. While animal models remain indispensable for addressing questions that cannot be ethically or feasibly studied in humans, their use must be scientifically justified, ethically rigorous, and aligned with clearly defined research objectives.

Protecting human health in an increasingly interconnected world requires shared responsibility, coordinated action, and mutual trust, because the health of humans, animals, and ecosystems is inseparable, and progress in one domain ultimately benefits all.

LABORATORY ANIMALS, ZOONOSES AND ONE HEALTH CONCEPT

Ashoka Dangolla

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Rabbits (*Oryctolagus cuniculus*), guinea pigs (*Cavia porcellus*), mice (*Mus musculus*), rats (*Rattus rattus*), and to a lesser extent marmoset monkeys (*Callithrix jacchus*), are widely used as laboratory animals. They play a crucial role in fundamental and applied biomedical research, including physiology, pathology, pharmacology, toxicology, neuroscience, parasitology, and vaccine efficacy studies, contributing significantly to human and animal health. All these species have wild counterparts, and although spillover of infections from wild to laboratory animals is relatively rare, disease transmission between wild, domesticated, and laboratory animals has been documented. These animals harbour species-specific infections as well as numerous zoonotic diseases that can spread to humans through direct contact, contaminated food, water, or intermediate hosts, necessitating strict preventive measures.

Rapid human population growth, deforestation, habitat fragmentation, unplanned urbanization, and industrialization have reduced natural habitats, forcing wildlife into closer contact with humans. Climate change, global warming, rising sea levels, and atmospheric changes further intensify these interactions. As a result, wildlife increasingly exploits agricultural crops, prompting the development of genetically modified, high-yield food sources. However, the widespread use of heavy metals, pesticides, and insecticides to sustain productivity on limited land poses serious health risks, potentially altering human immunity and increasing susceptibility to disease.

Environmental changes and altered host immunity have also driven the evolution of pathogens, leading to modified disease presentations, re-emergence of previously controlled infections, and the emergence of novel pathogens. Increased global travel and poor waste management, including extensive plastic use, exacerbate these

challenges. Addressing them requires improved recycling, public engagement, and interdisciplinary research.

Rising human–wildlife conflict and the increasing risk of zoonoses highlight the importance of laboratory animals in generating essential biological knowledge. Effective solutions demand a strong, integrated One Health approach, involving medical, veterinary, agricultural, environmental, and biological sciences. For this approach to succeed, senior scientists must actively embrace interdisciplinary thinking to ensure global health security for future generations.

PRECISION, RESPONSIBILITY, AND INNOVATION: PILLARS OF NEXT-GENERATION LABORATORY ANIMAL SCIENCE

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Laboratory animal science is experiencing a period of profound transformation driven by advances in biotechnology, evolving global ethical expectations, and increasingly robust regulatory frameworks. Three foundational pillars—precision, responsibility, and innovation reshape the discipline and guiding both global and Sri Lankan scientific communities toward next-generation practices. Precision underscores the scientific rigor required for producing reliable, reproducible results. It encompasses meticulous experimental design, appropriate statistical planning, genetic characterization of animal models, strict environmental control, standardized operating procedures, and comprehensive health surveillance programs.

Responsibility highlights the ethical and regulatory obligations that ensure humane animal care and uphold public trust. Central to this pillar are the 3Rs principle and its modern extensions, transparent oversight through institutional ethics committees, alignment with international guidelines, welfare-driven husbandry, and competency-based training for all personnel. Responsibility emphasizes that scientific quality and ethical integrity are inseparable.

Innovation captures the emerging technologies and conceptual shifts transforming laboratory animal use. Automation, digital monitoring, artificial intelligence, and predictive analytics are improving welfare assessment and reducing human error. Genetic engineering tools such as CRISPR are enabling precision disease models, while advanced non-animal approaches—including organoids, organ-on-chip systems, and in silico simulations—are expanding the feasibility of replacement and improving translational relevance. Refinement-oriented technologies, such as minimally invasive imaging and remote physiological tracking, further reduce stress and enhance data quality.

Together, these pillars form a synergistic framework that enhances scientific validity, strengthens ethical accountability, and accelerates technological progress. Global trends—including rising public scrutiny, demands for reproducibility, national strategies to reduce animal use, and integration of One Health and One Welfare concepts—are further shaping the future of the field. In Sri Lanka, emerging expertise, strengthened regulatory structures, and growing institutional capacity position the country to become a regional leader in humane, innovative biomedical research.

The convergence of precision, responsibility, and innovation provides a clear pathway toward a future in which laboratory animal science remains scientifically robust, ethically grounded, and technologically advanced.

3R PRINCIPLES AND NEW RESEARCH STRATEGIES IN PHARMACOLOGY AND TOXICOLOGY: ADVANCING ALTERNATIVE *IN VIVO* AND MODERN *IN VITRO* APPROACHES

Vir Vikram

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The evolution of pharmacological research has necessitated the adoption of ethical, innovative, and human-relevant experimental strategies. The "3R principles—Replacement, Reduction, and Refinement" form the cornerstone of responsible animal research and have significantly influenced modern drug discovery and development. This work highlights the integration of the 3R framework with emerging research strategies aimed at advancing pharmacology in the modern analytical era.

Alternative ***in vivo*** models such as zebrafish, drosophila, round worms, and silkworms are increasingly utilized for mechanistic studies, toxicity screening, and early drug evaluation due to their genetic tractability, cost-effectiveness, and reduced ethical concerns. In parallel**,** advanced *in vitro* systems, including three-dimensional cell cultures, organoids, organ-on-chip platforms, and co-culture models, provide physiologically relevant environments that enhance the predictive value of preclinical studies.

The role of modern analytical and computational approaches, including high-throughput screening, bioinformatics, and artificial intelligence-based data analysis, is emphasized for optimizing experimental design, improving data reproducibility, and strengthening translational accuracy. These approaches strongly support the principles of Replacement and Reduction while enabling efficient decision-making in drug development.

Overall, the integration of ethical frameworks with innovative experimental models and advanced analytical technologies represents a sustainable and forward-looking approach to pharmacological research, promoting scientific rigor, regulatory compliance, and improved human relevance while minimizing animal use.

PHARMACOVIGILANCE IN VETERINARY MEDICINE: INTEGRATING ANIMAL, HUMAN, AND ENVIRONMENTAL HEALTH

Pooja Gupta and Nikhil Sharma

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Veterinary medicinal products are extensively used in food-producing and companion animals for disease prevention and treatment. While these interventions improve animal health and productivity, they also present risks of adverse drug reactions, drug residues in the food chain, environmental contamination, and the development of antimicrobial resistance. Veterinary pharmacovigilance plays a critical role in detecting, assessing, and preventing adverse effects and other drug-related problems associated with veterinary medicines, thereby safeguarding animal welfare, public health, and ecological integrity.

This talk highlights the global evolution of veterinary pharmacovigilance, emphasizing harmonization initiatives led by the Veterinary International Cooperation on Harmonisation. The Indian veterinary pharmacovigilance landscape is discussed, including the regulatory surveillance and recent government initiatives that illustrate India's commitment to antimicrobial stewardship and One Health integration.
The presentation also discusses commonly used veterinary medicines and their documented adverse effects. Environmental risks arising from veterinary drug use, including contamination through animal excreta, farm runoff, improper disposal, and aquaculture practices, are reviewed alongside their effects on soil microorganisms, aquatic life, and wildlife.

The session concludes by emphasizing the need for strengthened reporting systems, rational drug use, safe disposal practices, and integrated surveillance across animal, human, and environmental sectors. Robust veterinary pharmacovigilance is essential for sustainable livestock production, food safety, and effective One Health implementation.

THE TRIANGLE OF COMMUNICATION, COLLABORATION, AND INNOVATION

Marcel Frajblat

Professor
ICLAS General Secretary
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Communication tools like Zoom and Teams existed before the pandemic, but it was during that period that the world clearly recognized their importance and potential. Suddenly, international meetings that once required flights, hotel costs, and complex scheduling could take place at minimal cost, bringing professionals from every region of the globe into the same "room". Online activities have limitations, especially due to the lack of physical informal interactions, but they offer important advantages: they make possible collaborations and discussions that would otherwise be impractical in person. The second word in this talk is innovation, which is not just a "nice" concept. Innovation is essential to our lives and our work, and it can be intentionally stimulated and encouraged. To innovate in Laboratory Animal Science, we need to pause and have focused conversations about where we want to advance. Do we want to innovate in environmental enrichment? Then we should dedicate time to map what we already know, what we currently do, what limits our progress, and which ideas can be tested. The same applies to any LAS area: refinement, training, biosecurity, husbandry and more.

Completing the triangle is collaboration: today, experiments can be run collaboratively across animal facilities around the world. We simply need to organize and plan. A colleague in Europe who is no longer based on an animal facility can still coordinate a project carried out in facilities across the Americas and Asia. Even a simple study, such as tracking the incidence of ulcerative dermatitis in C57BL/6 mice over a three-month period, can become more robust when conducted in multiple world regions, generating broader evidence and more generalizable insights. In this way, effective communication enables wide collaboration, and well-structured collaboration accelerates innovation. The goal of this presentation is to show how this triangle, communication, collaboration, and innovation, is connected, and how it can help drive the global advancement of Laboratory Animal Science.

ETHICS BEYOND COMPLIANCE: LABORATORY ANIMAL RESEARCH IN SRI LANKA – LESSONS, FAILURES, AND RESPONSIBILITIES

Mangala Gunatilake

Professor

Department of Physiology and 3Rs Centre in Laboratory Animal Science, Faculty of Medicine, University of Colombo

The ethical use of animals in laboratory-based research is a cornerstone of responsible science and professional integrity. In Sri Lanka, structured frameworks governing laboratory animal ethics have evolved around 2008/2009, largely in response to critical ethical challenges. Prior to the mid-2000s, animal experimentation in Sri Lanka was conducted without research-specific national legislation, relying instead on individual researcher judgment. This regulatory gap became evident following a widely acknowledged ethical breach in 2006 involving experimental surgical procedures on dogs, which resulted in animal deaths and exposed serious deficiencies in ethical review, pain management, and the application of humane endpoints.

The above-mentioned incident served as a catalyst for reform and evolution of laboratory animal ethics in Sri Lanka. In response, Sri Lankan researchers and academic institutions led by the Ethics Review Committee of the Faculty of Medicine, University of Colombo developed the *Guidelines for Ethics Review of Research Proposals Involving Animals* in 2009 and strengthened Institutional Animal Ethics Committees (IAECs) across universities. These developments aligned local research practices with international ethical principles, particularly the 3Rs - Replacement, Reduction, and Refinement - and established mandatory ethical approval for research and thereby, scientific publications.

The current ethical oversight system in Sri Lanka is primarily institutional rather than legislative, with notable strengths in awareness and review processes but persistent challenges related to national regulation, standardization, and infrastructure. Particular emphasis is placed on veterinary-specific ethical responsibilities, including appropriate analgesia, definition of humane endpoints, refinement of repeated procedures, and the essential role of veterinarians as ethical gatekeepers within research teams. Reinforcing the responsibility of young researchers as future leaders

in biomedical sciences is a must to integrate ethics, scientific quality, and animal welfare in laboratory research.

REPRODUCTIVE ENGINEERING IN LABORATORY ANIMALS: UNLOCKING SRI LANKA'S POTENTIAL IN BIOMEDICAL AND TRANSLATIONAL RESEARCH

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Department of Zoology & Environment Sciences, Faculty of Science,
University of Colombo

Over the last few decades, Sri Lanka has produced a substantial amount of laboratory animal-based research across biomedical and pharmaceutical disciplines. Much of this work has focused on ethnopharmacology, herbal medicines, toxicity screening, and descriptive physiology using laboratory rodents and small model organisms. While these studies have contributed valuable preliminary evidence, they have relied almost exclusively on wild-type animals, limiting mechanistic depth and reducing the capacity to model human disease with precision. As a result, Sri Lankan animal research has largely remained at an observational level, with minimal integration into precision medicine, molecular pathway analysis, or translational modelling.

Reproductive engineering in laboratory animals include controlled breeding, cryopreservation, strain development, and genetic modification offers a pathway to shift beyond descriptive studies and establish disease-specific, hypothesis-driven research platforms. By enabling the creation of targeted mouse models, Zebrafish mutants, and other engineered organisms, Sri Lanka can build capacity for mechanistic discovery, therapeutic testing, and advanced biomedical innovation. In this talk, insights gained through participation in the International Centre for Genetic Engineering and Biotechnology (ICGEB) Workshop on the Latest Advances in Genome Editing and ART Technologies in Laboratory Animals in İzmir, Turkey, and the Reproductive Engineering Workshop in Sri Lanka led by Prof. Toru Takeo, Centre for Animal Resources and Development (CARD), Kumamoto University, Japan will be used to explain how Sri Lanka can gradually enter this field by establishing phased capabilities, from strengthening existing animal facilities and adopting reproductive technologies to developing genetically modified and disease-specific model systems and, to highlight the broader role reproductive engineering could play in elevating

national research output, improving ethical animal use, and positioning the country within global translational science networks.

BEYOND THE MICROSCOPE: THE ROLE OF PATHOLOGY IN SHAPING ETHICAL AND COLLABORATIVE ANIMAL RESEARCH

Kavindra Wijesundera

Professor

Department of Veterinary Pathobiology, Faculty of Veterinary Medicine and Animal Science, University of Peradeniya, Peradeniya, Sri Lanka

Veterinary pathologists occupy a pivotal position in laboratory animal science, serving as the ultimate interpreters of tissue alterations and disease mechanisms. Beyond diagnostic confirmation, pathology intersects fundamentally with ethics, communication, and collaboration, thereby shaping the quality, validity, and societal acceptability of animal-based research.

The ethical responsibility of pathologists extends well beyond the classical framework of Russell and Burch's Three Rs. Diagnostic precision is a moral imperative, as misinterpretation of lesions can invalidate experimental outcomes and undermine the ethical justification for animal use. Through pathophysiological insight, pathologists contribute to refinement by defining scientifically justified humane endpoints, with the potential to reduce animal suffering by an estimated 40-60%. Strategic use of historical control data further enables reduction, decreasing animal numbers by 20-30% without compromising statistical robustness. Emerging ethical challenges include welfare assessment in genetically modified animals and the evaluation of severe disease models, where structured tools such as Bateson's ethical matrix provide a balanced framework for decision-making.

Popularization of pathology remains essential yet challenging due to its technical language and complex visual outputs. Advances in digital pathology and whole-slide imaging have democratized access to expert interpretation, exemplified by international initiatives such as the International Harmonization of Nomenclature and Diagnostic Criteria (INHAND). Adherence to ARRIVE guidelines strengthens transparent and reproducible reporting of histopathological findings. Clear visual communication using annotated images and standardized criteria enables meaningful

engagement with animal ethics committees, regulators, and multidisciplinary researchers.

Collaboration significantly enhances scientific rigor and animal welfare. Early involvement of pathologists in study design can reduce protocol amendments by up to 35%. Integration of *in vivo* imaging with pathology allows within-animal longitudinal assessment, potentially reducing animal use by 30-40%. Artificial intelligence (AI) is emerging as a powerful adjunct, supporting lesion detection, quantitative histopathology, and pattern recognition, while improving consistency and throughput. Crucially, pathological expertise remains essential for AI training, validation, and ethical deployment.

For Sri Lanka and South Asia, strengthening pathology capacity through targeted training, quality assurance, digital infrastructure, and regional networks is vital for ethical, collaborative, and globally relevant laboratory animal research.

CRYSTALLIZING UNNECESSARY AND 3Rs

Vijay Pal Singh[1], Sandhya Devi[1], Bilal Ur Rehman[1], Khushi Kumari[1], Anurag Parida[1], Anita Mandhare[3], Sanjeev Kumar Ojha[4], Viswajanani J Sattigeri[2]

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Throughout history, the use of animals in research has played a significant role in understanding human and animal biology, ailments, and the development of treatments. Pre-clinical animal experiments are commonly used in drug discovery, development, and Ayurveda to verify the therapeutic effects of herbal medicines. However, our systematic assessment through an exploratory study limited to herbal formulations reveals a significant number of redundant animal experiments, despite the availability of comprehensive documentation like the FSSAI (Food Safety and Standards Authority of India) Nutraceutical Regulations (2016) and the Ayurvedic Pharmacopoeia of India. We found 450 instances of duplicate records by examining 1,393 publications published between 2018 and 2024 in FSSAI and Pharmacopeia. These investigations were conducted to crystallize the concept of unnecessary experiments on animals concerning herbal/ayurvedic/nutraceutical drugs.

Conducting unnecessary experiments on animals when the same studies have been performed and documented causes unavoidable animal suffering while wasting valuable resources. It indicates that before doing new animal experiments, researchers should carefully review well-established traditional medicinal references and need to be given greater awareness of the Prevention of Cruelty to Animals Act of 1960, the need to avoid experiments that involve no value-addition and abide by moral precepts such as the 3Rs (Replacement, Reduction, Refinement). The lack of strict regulatory guidelines for the research and development of herbal and Ayurvedic medicines highlights the need to reduce unnecessary animal testing while maintaining scientific integrity and encouraging the integration of traditional knowledge into modern pharmacological and biomedical research.

ETHICS, 3RS & ANIMAL WELFARE: HOW IMAGING TECHNOLOGIES ENABLE REDUCTION AND REFINEMENT IN PRECLINICAL RESEARCH

Shahzada Asad

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Revvity Healthcare Private Limited, India

Imaging technologies have become a transformative force in modern drug discovery, enabling scientists to generate high-quality *in vivo* data while upholding the highest ethical standards of animal welfare. This session will discuss how advanced optical, bioluminescence, fluorescence, and high-content *in vivo* imaging platforms support the 3Rs; Reduction, Refinement, and Replacement, by allowing drug discovery teams to quantify pharmacodynamics, biodistribution, target engagement, and therapeutic efficacy in real time within the same cohort of animals.

Longitudinal imaging significantly reduces the number of animals needed for exploratory and confirmatory studies, strengthens statistical power, and minimizes inter-animal variability, all while accelerating decision-making in early discovery pipelines. Non-invasive imaging approaches also refine experimental workflows by reducing stress, enabling more humane study endpoints, and providing researchers with continuous insights that would otherwise require terminal procedures.

With examples across oncology, infectious diseases, inflammatory disorders, and gene therapy, the session will highlight how imaging combined with AI-driven quantification and automated analytics enhances translational predictability and shortens drug development timelines. Attendees will gain an actionable understanding of how integrating in vivo imaging into discovery programs not only improves scientific rigor but also advances ethical responsibility, positioning imaging as a cornerstone technology for future-ready, welfare-conscious drug discovery.

PRESENTATIONS

LIST OF ORAL PRESENTATIONS

1. **Experimental Validation of the Antidiabetic Potential of a Herbal Decoction using *in vitro* Yeast Cell Model and *in vivo* Zebrafish (*Danio rerio*) Model**
   Rasanjula, L., Karunathilaka, G.A.R.D., Manthila, K.D.M., Chamodya, Y.V.A.C., Rathnayaka, R.M.T.S., Silva, R.D., Herath, H.M.L.P.B., Kavindra, H.C.R.

2. ***Ex vivo* Evaluation of Hepatoprotective Activity and Potential Synergistic or Antagonistic Effects of Methanol, Dichloromethane, Hexane, and Combined Extracts of *Ircinia fasciculata* Utilizing Porcine Liver Slices**
   Subasinghe, U.R., Gunathilake, K.V.K., Karunarathna, U.

3. **Evaluation of *in vivo* Toxicity of *Psammocinia sp.* Marine Sponge Crude Extract**
   Jayaweera, J.A.A.V. and Gunathilake, K.V.K.

4. **Assessment of Irritation Potential of a Marine-Derived Lotion Using Modified Het-Cam Assay**
   Seneviratne, W.V. and Gunathilake, K.V. K.

5. **Assessment of Skin Permeation and Irritation Potential of a Topical Cream Containing a Novel Antifungal Agent for Dermatophytosis Using Non-Animal Models**
   Rajakulasooriya, R.S.R., Fernando, S.S.N., Gunasekara, T.D.C.P., Jayaweera, P.M., Kumarasinghe, K.G.U.R., Thabrew, H.H.P.M.J., Buddhika, R.B.J., Chan, E., Weerasinghe, G.G.Y.H., Karunarathna, K.A.A.U.

6. **Comparative Acute Toxicity Evaluation of Freeze-Dried and Spray-Dried forms of *Amurthashtaka kwatha* Using Zebrafish (*Danio rerio*) Model**
   Vinodani, L.P.S., Jayasuriya, W.J.A.B.N., Herath, H.M.D.R., Hapuarachchi, S.D., Dantanarayana, P., Suresh, T.S.

LIST OF POSTER PRESENTATIONS

7. **Neuroprotective Effects of Plant-Derived Compounds in *Drosophila melanogaster* Parkinson's Disease Models: A Systematic Review**
   Nifras, M.M.M., Dissanayake, W.D.N., Handunnetti, S.M., Gunawardena, S., Muthalib, A.M.

8. **Assessment of the Microbiological Status of the Laboratory Animal Colonies Maintained at the Medical Research Institute (MRI)**
   Karunakaran, R., Deshapriya, A.B.M.G., Pathirage, S., Jayasekera, P.I., Thammitiyagodage, M.G.

9. **Trend Analysis of Breeding Data of the Guinea Pig Colony Spanning Over Thirty Years at the Medical Research Institute Using Retrospective Observation**
   Rodrigo, J., Karunakaran, R., Silva, W.D., Rodrigo, W.W.P., Deshapriya, A.B.M.G., Kaushalya, A.G.G., Thammitiyagodage, M.G.

ABSTRACTS OF ORAL AND POSTER PRESENTATIONS

OP-01

EXPERIMENTAL VALIDATION OF THE ANTIDIABETIC POTENTIAL OF A HERBAL DECOCTION USING *IN VITRO* YEAST CELL MODEL AND *IN VIVO* ZEBRAFISH (*DANIO RERIO*) MODEL

Rasanjula, L.[1,2], Karunathilaka, G.A.R.D.[1], Manthila, K.D.M.[1*], Chamodya, Y.V.A.C.[1], Rathnayaka, R.M.T.S.[1], Silva, R.D.[1], Herath, H.M.L.P.B.[3], Kavindra, H.C.R.[2]

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Diabetes mellitus is a major global health concern, and limitations of current therapies have renewed interest in traditional remedies. In traditional Sri Lankan medicine, a combination of four plants named *Terminalia arjuna* (Arjun tree), *Syzygium cumini* (Java plum), *Ficus benghalensis* (Bayan tree), and *Salacia reticulata* (Kothala himbutu) is widely used for diabetes management, but experimental evidence remains limited. This study evaluated the antidiabetic potential of this traditional four-plant combination using *in vitro* and *in vivo* models. Authenticated barks were prepared as aqueous decoctions using equal proportions following traditional methods according to the Ola leaf manuscripts. Safety was assessed via zebrafish embryo toxicity assay according to OECD 236 guidelines. *In vitro* activity was evaluated through glucose uptake in *Saccharomyces cerevisiae* (yeast). Type 2 diabetes was induced in adult zebrafish by graded glucose immersion (20 → 111 mM over four weeks). Diabetic fish were treated with the decoction, metformin (positive control), and left untreated (negative control) for 14 days. Fasting blood glucose was measured using a glucometer. All adult zebrafish procedures were conducted under ethical approval. Data were analysed using one-way ANOVA followed by post-hoc multiple comparisons. The zebrafish embryo toxicity assay revealed an LC_{50} of 1000 µg mL^{-1}. In the yeast glucose uptake assay, the decoction significantly reduced uptake, and the uptake percentage is 58.77%, compared with 88.16% in the negative control and 33.19% in the metformin-treated sample. In adult zebrafish, fasting glucose rose from 57.10 ± 4.6 mg dL^{-1} (non-diabetic) to 206.75 ± 5.1 mg dL^{-1} after diabetes induction. Treatment with the decoction lowered glucose to 58.2 ± 3.0 mg dL^{-1} while the positive control (metformin) lowered to 58.0 ± 1.9 mg dL^{-1}($p < 0.01$). The decoction demonstrated potent antidiabetic activity *in vitro* and *in vivo*, with low toxicity, validating its traditional use and highlighting it as a safe and promising alternative for type 2 diabetes. Further studies in mammalian models are required to explore mechanisms and therapeutic value.

Keywords: Antidiabetic activity, Glucose uptake assay, Herbal decoction, Traditional medicine validation, Zebrafish (*Danio rerio*) model

OP-02

EX VIVO EVALUATION OF HEPATOPROTECTIVE ACTIVITY AND POTENTIAL SYNERGISTIC OR ANTAGONISTIC EFFECTS OF METHANOL, DICHLOROMETHANE, HEXANE, AND COMBINED EXTRACTS OF *IRCINIA FASCICULATA* UTILIZING PORCINE LIVER SLICES

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The present study investigates the hepatoprotective activity against ethanol-induced liver toxicity and synergistic/antagonistic effects of the marine sponge *Ircinia fasciculata* extracts using porcine liver slices, as the *ex vivo* model. The sponge extracts were prepared by maceration using methanol, dichloromethane, and n-hexane to assess for any potential synergistic or antagonistic effects and a Combined Extract (CE) was prepared by combining the three individual extracts. The hepatoprotective activity of the extracts was evaluated against ethanol-induced toxicity using the porcine liver slices collected from the Ja-Ela registered slaughterhouse after obtaining the prior permission from the Colombo Municipal Council. The release of the liver markers AST (Aspartate transaminase); ALT (Alanine transaminase); LDH (Lactate dehydrogenase) was measured, and the most potent concentrations were selected based on an initial wide-range dose screening. The assay was performed in triplicates; means were statistically compared using one way ANOVA with Dunnett's test and Tukey's test. All extracts demonstrated potent hepatoprotective activity showing significantly lower ($P < 0.05$) enzyme levels in comparison to the positive control. The methanol extract at 2000 µg mL^{-1}, dichloromethane extract at 1000 µg mL^{-1} and 31.25 µg mL^{-1} of the n-hexane extract were selected as the best hepatoprotective doses while for the combined extract, the 1000 µg mL^{-1} dose performed the best hepatoprotective activity. Out of the three selected doses, the methanol extract at 2000 µg mL^{-1} demonstrated the most pronounced hepatoprotective effect (Tukey's test: $P<0.05$). These findings revealed the strong hepatoprotective activity of *Ircinia fasciculata* extracts, with solvent polarity playing a key role in modulating bioactivity. The results also suggest possible antagonistic interactions between compounds, alongside detoxifying effects particularly evident in the methanol and dichloromethane extracts.

Keywords: *Ircinia fasciculata,* Porcine liver slices, AST, ALT, LDH

OP-03

EVALUATION OF *IN VIVO* TOXICITY OF *PSAMMOCINIA SP.* MARINE SPONGE CRUDE EXTRACT

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Marine sponges produce diverse bioactive compounds, many with therapeutic potential, yet these may also exhibit toxicity. Therefore, evaluation of their toxic and cytogenotoxic effects is crucial to determine both safety and biomedical value. Despite Sri Lanka's rich sponge diversity, limited studies have assessed their toxicity, creating a significant research gap. The present study investigates the toxicity of the crude extract of a marine sponge, *Psammocinia* sp., collected from Unawatuna, Galle, Sri Lanka, using three models: *Allium cepa*, *Artemia salina,* and *Danio rerio*. Sponge specimens were identified based on morphological and skeletal features using light and scanning electron microscopy. Sponge crude extracts (SCE) were prepared using methanol/dichloromethane (1:1, v/v) solvent extraction, followed by rotary evaporation. The general toxicity of SCE was evaluated using *Artemia salina* lethality and *Danio rerio* embryo toxicity assays, while cytogenotoxicity was assessed using the *Allium cepa* assay. The LC_{50} value for *A. salina* lethality was 1491.7 μg mL^{-1}, indicating moderate toxicity ($p < 0.05$). Zebrafish embryos exposed to varying concentrations of SCE exhibited survival rates between 63.33% and 86.67% after 96 hpf, with no significant difference from controls ($p > 0.05$). Embryos treated with extracts at 0.1–100 μg mL^{-1} concentration developed normally, while 1000 μg mL^{-1} caused marked developmental abnormalities such as reduced epiboly, somite and head malformation, spinal deformities, and oedema. Hatching rates decreased in a dose-dependent manner, with the lowest rate observed at 1000 μg mL^{-1}, though all embryos hatched by 72 hpf. Heart rates remained normal up to 100 μg mL^{-1}, but embryos at 1000 μg mL^{-1} showed transient cardiac arrest at 24 hpf followed by partial recovery, indicating concentration-dependent developmental toxicity. In the *A. cepa* assay, the extract significantly ($p < 0.05$) inhibited root growth (EC_{50} = 179.66 μg mL^{-1}) and induced concentration-dependent cytotoxic and genotoxic effects, including root gelling, swelling, necrosis, pigmentation, and chromosomal abnormalities such as stickiness and c-mitosis. The findings suggest that *Psammocinia* sp. crude extract possesses moderate toxicity with respect to control and cytogenotoxic potential, warranting further investigation. Future studies are underway to evaluate the therapeutic potential of the sponge-derived compounds.

Keywords: *Psammocinia* sp., marine sponge, toxicity, cytogenotoxicity, *Allium cepa*, zebrafish, bioactive metabolites

OP-04

ASSESSMENT OF IRRITATION POTENTIAL OF A MARINE-DERIVED LOTION USING MODIFIED HET-CAM ASSAY

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Marine-derived bioactive compounds are increasingly utilized in cosmetic formulations due to their natural origin and potential skin-protective properties. However, necessitating reliable safety assessments prior to human application is obligatory. This study assessed the irritation potential of a newly developed lotion formulation containing beta-carotene and carrageenan derived from the red macroalga *Hypnea* sp. Hen's Egg Test on the Chorioallantoic Membrane (HET-CAM), a well-established alternative to ocular irritation assays due to its sensitivity to vascular reactions comparable to conjunctival tissue, was used as the alternative model, adhering to 3Rs principles. Fertilized White Leghorn eggs were incubated under controlled conditions (37.5 ± 0.5 °C; 60–70% relative humidity) for 10 days, after which viable embryos were identified by candling. The chorioallantoic membrane was exposed for treatment: included 10% NaOH (positive control), distilled water (negative control), the lotion base (F3; composed of glycerine, triethanolamine, distilled water, methyl paraben, acetyl alcohol, almond oil, liquid paraffin, and stearic acid), and the final formulation (F7), which incorporated carrageenan and beta-carotene into F3. Each sample (0.3 mL) was applied to four eggs and rinsed after 20 seconds with physiological saline. Vascular reactions, including hyperaemia, feathering, haemorrhage, and coagulation, were evaluated at 0.5, 2-, and 5-minutes post-application. The positive control produced severe irritation, evident through intense haemorrhage and coagulation, with irritation scores ranging from 15 to 27 and a group mean of 22.5 ± 5.0. Conversely, the negative control, lotion base (F3), and formulated lotion (F7) exhibited no vascular changes, with irritation scores of zero across all tested eggs. These results confirmed the non-irritant nature of both the lotion base and the developed formulation, highlighting their suitability for topical application. The inclusion of carrageenan and beta-carotene, both marine-derived bioactive compounds known for safety and biocompatibility on biological membranes further supports the formulation's potential for safe cosmetic use.

Keywords: HET-CAM, Beta-Carotene, Carrageenan, *Hypnea sp.,* Irritation test

OP-05

ASSESSMENT OF SKIN PERMEATION AND IRRITATION POTENTIAL OF A TOPICAL CREAM CONTAINING A NOVEL ANTIFUNGAL AGENT FOR DERMATOPHYTOSIS USING NON-ANIMAL MODELS

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Topical antifungal agents are the mainstay of treatment for dermatophytosis, a superficial fungal infection caused by dermatophytes. The therapeutic efficacy of these formulations depends on both the potency of the antifungal agent and effective delivery to the stratum corneum and viable epidermis. Equally critical is ensuring that both the active ingredients and excipients are safe for topical application. This study aimed to evaluate the efficacy and safety of a topical cream containing the novel antifungal agent 3-(benzylidene) indolin-2-one, which has previously demonstrated potent in-vitro activity against dermatophytes including *Trichophyton mentagrophytes*, *Trichophyton rubrum, Microsporum canis, Microsporum gypseum* and *Epidermophyton floccosum*. Porcine ear skin was used as a surrogate for human skin to assess drug permeability. A finite dose (15 mg cm^{-2}) of the 3% cream was applied to porcine skin mounted on Franz diffusion cells containing PBS: PEG 20 (60:40 v/v, pH 7.4) as the receptor medium. Samples were collected at predetermined time intervals (0, 1, 2, 4, 6, 20, and 24 hours), and drug permeation was quantified spectrophotometrically. After 24 hours, the drug retained in the epidermal and dermal layers was extracted using methanol: chloroform (2:1 v/v) and analysed spectroscopically. The skin irritation potential of the cream was evaluated using the Hen's Egg Test–Chorioallantoic Membrane (HET-CAM) assay, following the Interagency Coordinating Committee on the Validation of Alternative Methods (ICCVAM), with saline and 0.1 N NaOH as negative and positive controls, respectively. The 3-(benzylidene) indolin-2-one cream demonstrated low systemic exposure and higher retention in the epidermis (59.13 ± 3.93 µg cm^{-2}) compared to

the dermis (48.79 ± 6.07 µg cm^{-2}) after 24 hours, corresponding to levels sevenfold higher than the minimum inhibitory concentration for dermatophytes. Neither the drug-loaded cream nor the cream base induced irritation in the HET-CAM assay. These findings confirm that the 3% cream enables effective epidermal localization of 3-(benzylidene) indolin-2-one without significant irritation, supporting its potential as a safe and effective topical formulation for dermatophytosis and warranting further in vivo evaluation.

Keywords: Dermatophytosis; Topical formulations; Skin permeation; HET-CAM; Franz diffusion cell

Acknowledgement: The authors acknowledge financial support from the Open University of Sri Lanka (Faculty Research Grant: OUSL/FHS/24/02) and thanks the Faculty of Veterinary Medicine & Animal Science, University of Peradeniya, and the Municipal Veterinary Department, Colombo for facilitating the experiments.

OP-06

COMPARATIVE ACUTE TOXICITY EVALUATION OF FREEZE-DRIED AND SPRAY-DRIED FORMS OF *AMURTHASHTAKA KWATHA* USING ZEBRAFISH (*DANIO RERIO*) MODEL

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Amurthashtaka kwatha is an Ayurvedic polyherbal decoction used to manage fever, inflammation, and digestive disorders. Zebrafish (*Danio rerio*) are an effective and economical vertebrate model for toxicity assessment. This study aimed to evaluate and compare the acute toxicity of freeze-dried and spray-dried forms of *Amurthashtaka kwatha* following OECD Test Guideline 236. Zebrafish embryos were obtained from the Medical Research Institute, Colombo, and maintained in embryo rearing medium. Twenty-four-well plates were used with five test concentrations (250, 375, 562.5, 843.75, and 1265.63 mg L^{-1}), along with negative (dilution water), solvent (distilled water), positive (3, 4-dichloroaniline, 4 mg L^{-1}), and internal controls. All assays were performed in triplicate at the faculty of Indigenous Medicine, University of Colombo. Embryos were observed for coagulation, non-detachment of the tail, lack of somite formation, and lack of heartbeat at 24-, 48-, 72-, and 96-hours post-fertilization. The positive control induced embryo lethality exceeding the minimum OECD validity criterion (≥ 30%), while all control groups showed ≥ 90% survival, thereby meeting OECD validity requirements. The median lethal concentrations (LC_{50}) were 663.7 ± 0.96 mg L^{-1} for the freeze-dried and 765.8 ± 0.86 mg L^{-1} for the spray-dried forms ($p = 0.08$, $p > 0.05$). The equivalent theoretical human dose was calculated using the equation: Human dose (g day^{-1}) = Zebrafish concentration (mg L^{-1}) × 6 / 1000. Theoretical human dose equivalents were 3.98 ± 0.11 g day^{-1} and 4.59 ± 0.23 g day^{-1}, respectively. The spray-dried *Amurthashtaka kwatha* showed a higher LC_{50} value than the freeze-dried form in the zebrafish embryo assay, indicating comparatively lower acute toxicity, although the difference was not statistically significant. This difference may be attributed to uniform particle size distribution and reduced degradation of phytoconstituents during spray drying. Therefore, both freeze-dried and spray-dried *Amurthashtaka kwatha* exhibited acceptable acute safety profiles, supporting their suitability for further pharmacological and toxicological evaluation.

Keywords: Acute toxicity, *Amurthashtaka kwatha*, freeze-dried, median lethal concentrations, spray-dried

PP-01

NEUROPROTECTIVE EFFECTS OF PLANT-DERIVED COMPOUNDS IN *DROSOPHILA MELANOGASTER* PARKINSON'S DISEASE MODELS: A SYSTEMATIC REVIEW

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Neurodegenerative diseases, including Parkinson's disease (PD), pose a significant global health challenge due to the lack of a definitive cure. Conventional pharmacological therapies offer only symptomatic relief, highlighting the need for plant-based natural products, including plant-derived compounds, with neuroprotective effects. To systematically synthesize the available evidence on plant-derived neuroprotective compounds in *Drosophila melanogaster* PD models, a systematic review was conducted using Scopus, PubMed and Google Scholar databases, covering studies published between 2010–2025 following PRISMA guidelines. Eligible experimental studies evaluating plant-derived compounds in genetic or toxin-induced *Drosophila* PD models were identified using predefined inclusion and exclusion criteria. Two independent reviewers screened titles, abstracts, and full texts, and data were extracted on plant-derived compounds, PD models, outcomes, and proposed mechanisms. Keywords and Boolean combinations included: *"plant-derived compounds" OR phytochemicals* AND *"neuroprotection" OR "neuroprotective effect"* AND *"Parkinson's disease" OR Parkinsonism* AND *"Drosophila melanogaster" OR "Drosophila model" OR "fruit fly model."* A total of 30 studies meeting the inclusion criteria were included in in-depth analysis based on predefined scope and feasibility considerations. These studies investigated a variety of plant-derived compounds, including Acteoside, α-Arbutin, Apigenin, Asiatic acid, β-Asarone, β-Carotene, Caffeic acid, Calycosin, Capsaicin, Corynoxine-B, Curcumin, Dehydrozingerone, Epigallocatechin-3-gallate, Farnesol, Gardenin-A, Genipin, Geraniol, Ginsenoside-Re, Hesperidin, Hesperetin, Kaempferol, Lutein, Myricetin, Naringenin, Nicotine, *p*-Coumaric acid, Resveratrol, Scopoletin, Tangeritin and Vincamine. Most studies demonstrated significant improvement in climbing ability, lifespan, preservation of dopaminergic neurons and reduction of oxidative stress. Mechanistic insights suggest that plant-derived compounds exhibit neuroprotective effects in *Drosophila* PD models by modulating mitochondrial function, enhancing

antioxidant defences, and attenuating neuroinflammation. However, the current evidence is limited by variations in experimental design, dosage, treatment duration, and the lack of standardized outcome measures across studies. These findings support further research, including validation in higher animal models and clinical studies, to establish the therapeutic potential and safety of bioactive plant-derived compounds in human PD.

Keywords: Parkinson's disease, *Drosophila melanogaster,* Neuroprotection, Plant natural products, Plant derived compounds

PP-02

ASSESSMENT OF THE MICROBIOLOGICAL STATUS OF THE LABORATORY ANIMAL COLONIES MAINTAINED AT THE MEDICAL RESEARCH INSTITUTE (MRI)

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Regular microbiological monitoring is crucial to maintain the Specific Pathogen Free (SPF) laboratory animal colonies at the MRI for research and diagnostic purposes. This study aims to assess the microbiological status of the laboratory animal colonies at the MRI. Samples were randomly collected from animals originating from SPF status from Japan and maintained at the Animal Centre at MRI for more than 30 years using standard breeding methods. A total of 5% adult rats and mice were randomly selected: 18 ICR mice, 7 BALB/cA mice, 7 C3H/HeN mice, 4 C57BL/6N mice, and 10 Wistar rats. They were humanely euthanized using CO_2 and observed for any lesions and parasites. Blood samples, postmortem examinations, tracheal and caecal swabs, and their water bottles were tested. Additionally, 33% of rabbits and guinea pigs (10 each) were checked for any lesions, and nasal swabs and food dredge were plated on blood agar. Faecal samples were analysed using the salt floatation test and the cellophane tape method for gastrointestinal parasites, and airborne microbes were assessed using open blood agar and potato dextrose agar plates. No lesions were found in the external and internal organs of the animals. No external and internal parasites were found. Throat swabs from mice and rats tested negative for pathogenic bacteria, including *Pasteurella pneumotropica*, *Staphylococcus aureus*, *Streptococcus zooepidemicus*, *Corynebacterium kutscheri*, and *Streptococcus pneumoniae*. Mycoplasma species are important in laboratory animal colonies that are contagious and screening of mycoplasma strains was done using serum samples. All the tested samples were negative for *Mycoplasma*. Two water samples from each animal room and in total of 16 water samples were tested and only three samples were positive for *Pseudomonas aeruginosa* (18.7%). Caecal samples tested negative for *Salmonella, Shigella*, and *Campylobacter*. Faecal samples from rats and mice also tested negative for Giardia species. Isolates from guinea pigs and rabbits were negative for *Pseudomonas aeruginosa*, *Streptococcus pneumoniae, Streptococcus zooepidemicus, Staphylococcus aureus, Pasteurella multocida, Pasteurella pneumotropica, Bordetella bronchiseptica,* and *Corynebacterium kutscheri* and no eggs were detected in their faecal samples. A falling microbial count is important to detect the functioning of the air exhaust system and barrier system maintenance in the facility. It was tested using plate count agar and Potato dextrose agar and however, bacterial and fungal growths were observed in airborne microbial tests. Despite some positive findings related to airborne microbes and contaminated water bottles, which pose potential

threats to the laboratory animals at the MRI, the animal colonies are generally free from most specific pathogenic bacteria, fungi, external parasites, and gastrointestinal worms. This confirms their suitability for research. More stringent water treatment measures and improved maintenance of the barrier systems are essential to safeguard the animal colonies at MRI.

Keywords: Microbiological monitoring, laboratory animal colony, pathogenic bacteria, Medical Research Institute, and falling microbial test

PP-03

TREND ANALYSIS OF BREEDING DATA OF THE GUINEA PIG COLONY SPANNING OVER THIRTY YEARS AT THE MEDICAL RESEARCH INSTITUTE USING RETROSPECTIVE OBSERVATION

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The guinea pig colony at the Animal Centre of Medical Research Institute (MRI) is a product of an initial colony imported from Charles River Laboratories, Japan, in 1990, consisting of 10 males and 20 females. The colony had been maintained by standard random mating systems (outbred). Subsequently, in 1995 new animals were imported (40 females:10 males) to minimize the inbreeding effect, but after that new animals were not introduced due to cost factor. Though standard breeding methods are practiced, inbreeding is inevitable over the years. The Guinea pig breeding data, however, have not been analysed for the past 30 years. This study aims to address the requirement of trend analysis of guinea pig breeding data spanning over 30 years and identify patterns and trends and forecast future breeding and weaning patterns of the colony. As this is the one and only guinea pig colony available for research use in the country, it is important to assess and predict it for future use. The Hartley guinea pig records at the MRI, spanning thirty years from 1990, were computerized using Excel and Numbers software. The data consist of the period between the date of mating and the date of parturition, date of delivery, date of weaning, weaning percentage by gender, litter size, litter success rates until weaning, and parity. The data were statistically analysed using the R statistical package. Linear regression analysis revealed a significant decreasing trend in litter size ($p < 0.001$), indicating a gradual reduction over the 1996–2024 period. In contrast, weaning survival showed no significant temporal trend ($p > 0.05$), suggesting relative stability across the years. ARIMA modelling identified weak temporal dependence in litter size (ARIMA (4,1,0) but an overall stable mean of approximately 3 pups per litter. Weaning survival was best described by the ARIMA (2,0,0) model, projecting an average of about 2.0 pups per litter. Forecasts for 2025–2034 indicate continued stability in reproductive performance, with expected litter sizes around 3 pups per year and consistent weaning survival near 2 pups per litter. These results suggest that the breeding colony of guinea pigs at MRI has achieved a stable reproductive equilibrium, exhibiting minimal year-to-year variation.

Keywords: ARIMA model, Guinea pigs, Medica Research Institute, random mating, retrospective analysis

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Building a Culture of Care: Advancing Responsible, Reproducible Animal Research for Precision Medicine in the One Health Era

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Today, more than ever, the world is reminded that human health, animal health, and environmental health are inseparably intertwined. This interconnectedness is not a novel concept. In fact, our understanding of "One Health" can be traced back centuries. As far back as the 4th century BCE, Hippocrates, in his famous work "On Airs, Waters, and Places," emphasized that a clean and balanced environment is essential for human well-being. Even then, the seeds of One Health were being sown. Moving forward to the 19th century, Rudolf Virchow, the father of modern pathology, deepened this understanding. By coining the term "zoonosis" and advocating for the concept of One Medicine, he boldly declared: "Between animal and human medicine, there are no dividing lines – nor should there be." His words still resonate today, guiding our work as we confront global health challenges that transcend species and ecosystems. A growing global population, climate change, large-scale deforestation, industrial agriculture, intensified livestock farming, and increasing movement of people and goods, have brought humans into closer contact with wildlife and with novel pathogens. As a result, the risk of emerging infectious diseases, zoonotic spillovers, and global pandemics has dramatically increased. As the WHO Director-General, Dr. Tedros Adhanom Ghebreyesus, has further emphasized: "We can only prevent future pandemics with an integrated One Health approach to public health, animal health, and the environment we share."

Medicine has long supported the principles of One Health by focusing on the prevention, diagnosis, and treatment of diseases in both humans and animals, and by recognizing the interconnections between people, animals, and the environment. When considering the evolution of medicine from its earliest stages to the present day, it is clear that we have passed through several important eras, each contributing to the integrated, multidisciplinary approach we value today. From the 1950s to the 1980s, we lived in the era of Intuitive Medicine. During this time, clinical decisions were driven largely by physician experience and careful observation. Diagnostics were limited, and treatments were broad and often non-specific. From the 1980s to the 2000s, we moved into the era of Evidence-Based Medicine. This was a time when clinical practice became grounded in scientific data, controlled trials, standardized guidelines, and rigorous reproducibility. Medicine became more consistent, transparent, and measurable. Then around 2010, we entered the era of Precision Medicine, where we remain today. This era recognizes that patients, even those with the same diagnosis, can differ profoundly in their genetics, environmental exposures, immune responses, and disease progression.

Precision medicine uses genomics, biomarkers, molecular profiling, and computational tools to tailor treatments to individuals and teaches us a powerful truth: *one size does not fit all*. Thus, the modern healthcare strives to deliver *The Right Dose of the Right Drug for the Right Indication to the Right Patient at the Right Time*. These personalized approaches can be made possible through pharmacogenomics, the study of how genetic variation influences drug absorption, metabolism, efficacy, and toxicity. Pharmacogenomics allows us to move away from trial-and-error prescribing. When a gene variant is linked to a specific drug response, clinicians can make informed decisions: adjusting the dose, selecting an alternative medication, or avoiding a treatment entirely. A well-known example is the blood-thinning medication Warfarin. Warfarin acts on the VKORC1 gene and is metabolized by the enzyme encoded by CYP2C9. Naturally occurring variations in these genes cause major differences in how individuals respond to Warfarin. Some people metabolize it slowly and are at high risk of bleeding. Others clear it quickly and require higher doses. Because of this genetic variability, the U.S. Food and Drug Administration recommends that Warfarin dosing incorporate the patient's genotype. This reduces side effects, improves safety, and makes treatment more precise. Another example,

one that also demonstrates cost-effectiveness is the use of Imatinib in chronic myelogenous leukaemia (CML).

Imatinib inhibits a tyrosine kinase that becomes abnormally active due to a specific genetic fusion between the *bcr* and *abl* regions, producing the *bcr-abl* fusion gene, also known as the Philadelphia chromosome. However, not all CML patients carry this mutation.

So Imatinib is effective only in those whose tumours harbour the *bcr-abl* fusion. By screening for this mutation before treatment, Imatinib is given only to the patients who will benefit, reducing unnecessary toxicity, reducing wasted cost, and dramatically shortening the time to effective therapy. This is precision medicine at its best: targeted, efficient, and personalized. Precision medicine is not limited to treatment; it is also transforming disease control and early surveillance. Genetic markers now allow us to identify individuals at higher risk long before symptoms appear. For example, HLA-based precision medicine has become a powerful tool in rheumatology and dermatology. Individuals who are HLA-B27 positive have a significantly higher risk of developing psoriatic arthritis. Similarly, those who carry the HLA-Cw6 allele have a higher likelihood of developing early-onset or severe psoriasis. By identifying these individuals early, clinicians can intensify monitoring, initiate preventive interventions, and personalize treatment strategies long before irreversible damage occurs.

Importantly, precision medicine is not limited to humans. Veterinary precision medicine is expanding rapidly and is becoming a vital pillar in the One Health framework. Genetic testing for personalized cancer treatment in dogs is practiced globally. Certain breeds, such as Boxers, have a genetic predisposition to cancers like lymphoma. Genetic profiling helps veterinarians tailor interventions, select targeted therapies, and improve survival. Similarly, genetic screening for inherited conditions such as hip-dysplasia in large-breed dogs before clinical signs appear is becoming increasingly common. Early identification allows preventive strategies, breeding decisions, and personalized care plans. These breakthroughs in veterinary genomics not only improve animal welfare but also strengthen disease surveillance systems, especially for zoonotic diseases with genetic determinants.

Collectively, when genomic information, clinical data, and environmental factors are integrated across species, precision medicine produces benefits that extend far beyond

individual patients. It enables improved patient care through personalized and more effective interventions, supports disease prevention and early surveillance by identifying high-risk individuals before illness develops, and reduces healthcare costs and treatment time by avoiding ineffective therapies. At the same time, it stimulates drug development by enabling the creation of targeted treatments based on precise molecular pathways. Ultimately, precision medicine promotes personalized health for both humans and animals, thereby strengthening the One Health approach through a deeper understanding of shared genetic risks and environmental influences.

Laboratory animals are essential drivers of precision medicine because they allow researchers to model human diseases, test targeted treatments, and understand the effects of genetic variability. For example, the Apc $^{Min/+}$ mouse model replicates colorectal cancer seen in humans, enabling the study of tumour development and evaluation of personalized therapies[1]. Humanized mouse models for neurodegenerative diseases, such as Alzheimer's, allow testing of drugs that specifically target human protein variants, improving translational relevance. Knockout animals are used to study immune system functions and disease mechanisms, as seen in IBD research, revealing how specific genes influence immune responses (Figure 1)[2]. Additionally, studying different strains or genetically engineered animals helps uncover how genetic variation affects disease susceptibility and treatment outcomes, providing critical insights for developing patient-specific therapies (Figure 2)[3]. Together, these models form a cornerstone of precision medicine by bridging basic research and individualized clinical care.

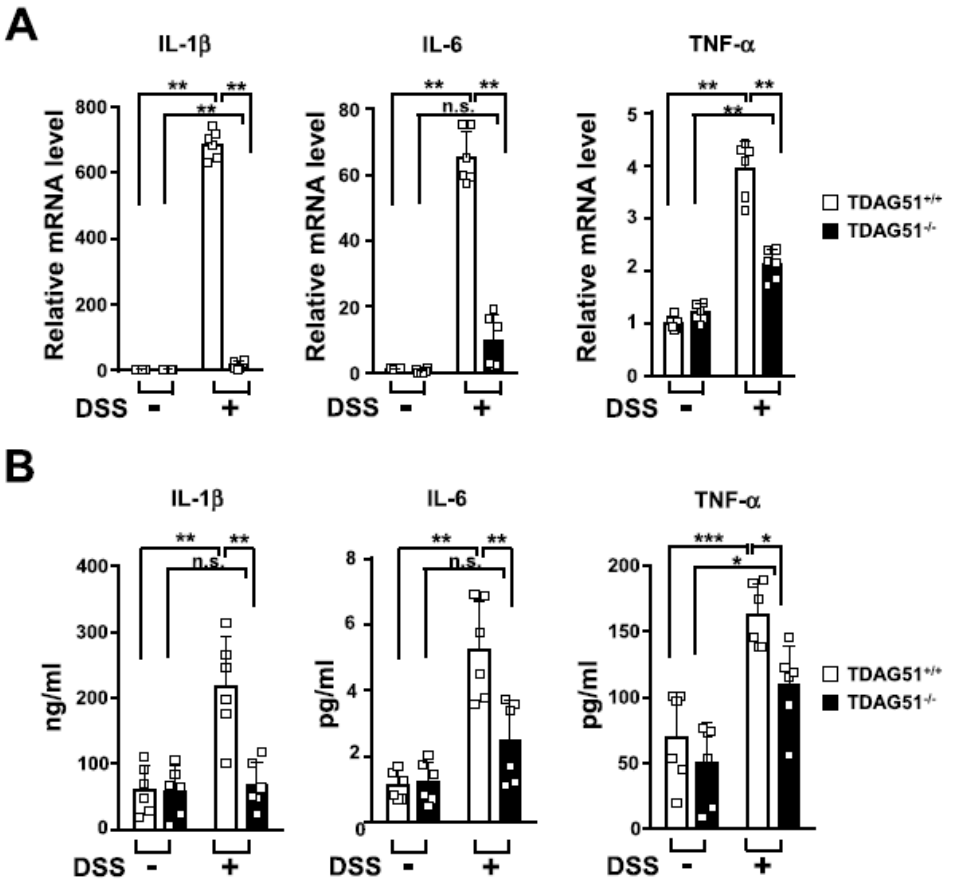

Figure 1. Knockout mice are used to study immune system functions and disease mechanisms in Inflammatory bowel disease. This study revealed a that the deficiency of T cell death-associated gene 51 (TDAG51/PHLDA1) is protective against chemically (Dextran Sulphate Sodium) induced IBD through suppression of inflammatory cytokines[2].

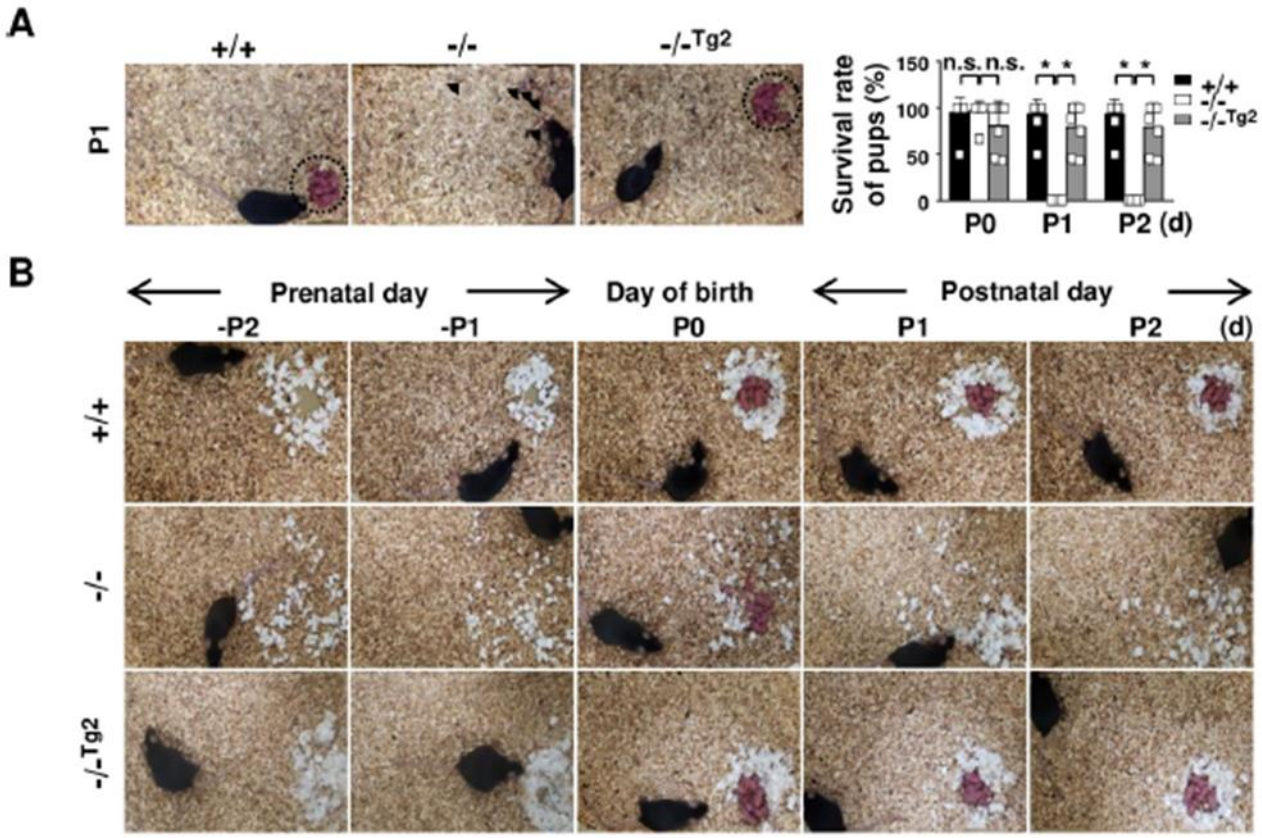

Figure 2. Knockout and transgenic mice used in postpartum depression research. This study revealed a novel function of T cell death-associated gene 51 (TDAG51/PHLDA1) in the regulation of maternal and depressive-like behaviour using wild type, TDAG51 deficient (-/-) and brain-specific TDAG51 transgene expressed (-/-Tg2) mice[3].

Precision medicine cannot advance without precision in animal care and animal research is only as good as the Culture of Care (CoC) that supports it. A true CoC warrants commitment to animal welfare, scientific quality, well-being of staff, and transparency with all stakeholders. Effective implementation of the 3Rs principle (Replacement, Reduction, Refinement) is one of the main requirements for establishing a CoC[4]. Today, an expanding array of scientifically validated alternatives allows us to replace or supplement traditional animal models: two- and three-dimensional cell cultures, organoids, stem cells, *Caenorhabditis elegans*, *Drosophila melanogaster*, Zebrafish, the HET-CAM test, etc. Replacement not only fulfils an ethical requirement but also directly contributes to reducing the number of animals used in research. Reduction is further advanced when we apply the principle of choosing the right model for the right reason, and when we commit to the "3Ss": Good Science, Good Sense, and Good Sensibilities. Sound experimental design, rigorous

statistical planning, and thoughtful resource allocation ensure that animals are never used needlessly. Addressing sex bias is also essential. Persistent reliance on single-sex preclinical studies leads to unnecessary animal use, weakens reproducibility, and can produce misleading or even harmful scientific conclusions. The case of Zolpidem (Ambien) is instructive: preclinical testing was conducted primarily in male animals, yet women metabolize the drug more slowly. This gap in design had real-world clinical consequences. By eliminating sex bias, we not only prevent waste, but we substantially improve the precision, safety, and applicability of our research outcomes. Refinement remains equally critical. It encompasses every effort to minimize pain, distress, and disruption to the animals in our care. This includes positive-reinforcement training, the careful selection and monitoring of anaesthetics, and the use of non-invasive or minimally invasive blood collection methods such as volumetric absorptive micro sampling methods.

3Rs can also be thoughtfully applied to the people who work in animal research[4]. Replacement, in this human context, means ensuring that only those who genuinely choose to work with research animals and who understand the ethical weight of that work are placed in these roles. When individuals are committed, informed, and aligned with the mission, both animal welfare and staff well-being are significantly enhanced. Reduction refers to structuring teams so that only the necessary number of highly qualified individuals are directly involved in animal research, while still maintaining the highest standards of welfare. This is not about limiting opportunity; it is about ensuring that everyone involved is well-trained, well-supported, and operates at a level of proficiency that protects both animals and scientific integrity. Refinement, applied to people, speaks to the reduction of mental and emotional stress. Animal research can be demanding, not only physically, but emotionally. Refinement involves providing early and ongoing support for mental health, building resilience training in career development, and ensuring that staff have access to resources that help them manage the emotional complexities of their work. By addressing these needs proactively, we create an environment in which staff can thrive, engage ethically, and deliver the highest quality of care. In addition to the 3Rs, CoC is enriched by an expanding set of "additional Rs" that reflect the evolving expectations of modern science. Responsibility is fundamental. It encompasses our duty to justify every action taken with an animal, and to ensure that it is ethical, transparent, and

scientifically defensible. Responsibility extends from the design of the study to the daily care of the animals, the training and well-being of staff, and the integrity with which results are communicated. A responsible research environment is one in which ethical reasoning is not an afterthought, but a guiding principle. Reproducibility is equally essential. As we confront a global reproducibility crisis in biomedical research, we must recognize that high-quality animal care is not separate from scientific validity, it is integral to it. Standardized procedures, appropriate model selection, proper statistical design, and meticulous record-keeping all contribute to reproducible outcomes. When conditions are controlled, welfare is safeguarded, and bias is minimized, the science becomes stronger, more reliable, and more impactful. Rehabilitation represents our commitment to the life of the animal beyond the experiment. When feasible and appropriate, rehoming or retirement programs provide former research animals with the opportunity to live out their lives in comfort and dignity.

A true CoC also depends on strong leadership. Leadership in this context is not merely administrative, it is ethical, strategic, and deeply human. Leaders must possess a clear understanding of animal care and welfare, and they must ensure that the principles of the CoC permeate every level of the organization. This means fostering an environment in which communication is open, staff are empowered, and the necessary infrastructure is fully supported. It also includes recognizing and rewarding staff contributions, ensuring thoughtful and tailored recruitment, maintaining robust systems, and prioritizing staff well-being. Practical measures such as allergen reduction using automated waste disposal systems, anaesthetic gas scavenging systems, automated systems that decrease error and workload, and rigorous microbiological monitoring all contribute to a healthier, safer, and more sustainable work environment. When staff members are empowered, skilled, and appreciated, everything improves animal handling, research quality, and the ethical climate of the institution. Compassion fatigue, a very real and often unspoken challenge for individuals who work closely with research animals, should also be recognized. Supporting staff through open dialogue, and mental-health resources is not optional; it is an ethical necessity. Remembrance activities can also play a meaningful role in combatting compassion fatigue in addition to the formal acts of recognition honoring the contribution of laboratory animals to scientific progress, help staff process the

emotional weight of their work. They reinforce our shared values, strengthen resilience, and remind us that compassion and science are not opposing forces but partners in responsible research.

A mature CoC also requires that we practice a Culture of Challenge. This means continuously and constructively questioning our/others own assumptions, our procedures, and our scientific models. It calls on us to ask, at every stage, whether there is a better, more humane, or more rigorous way to achieve our goals.

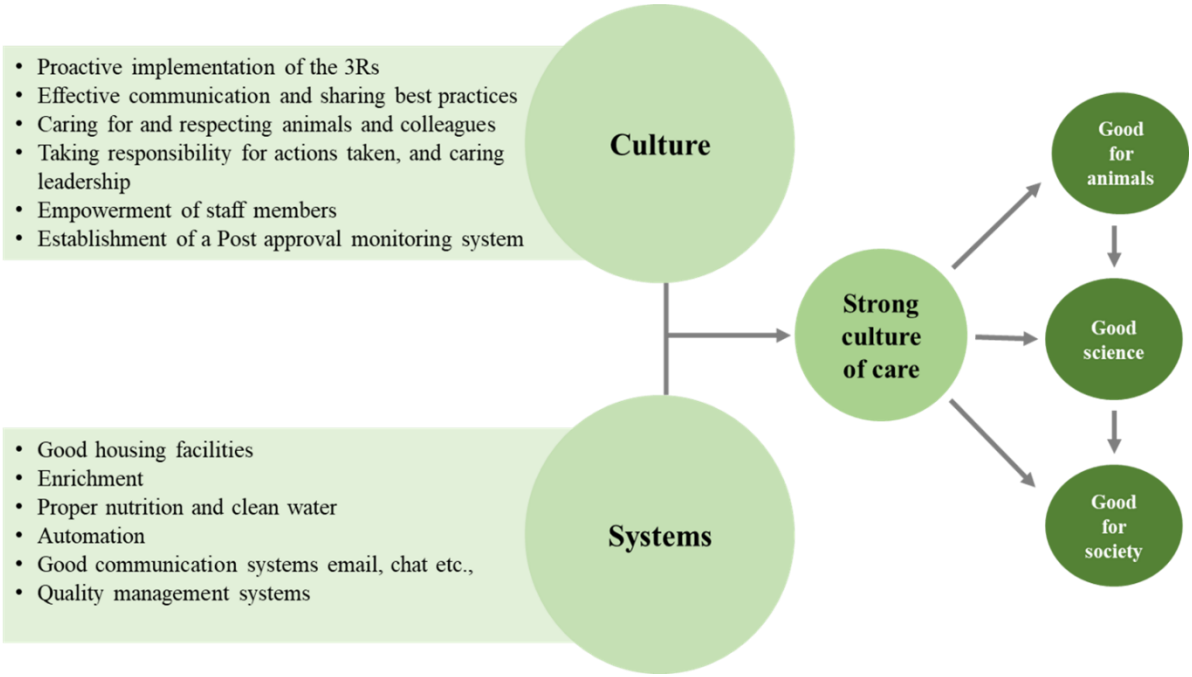

Figure 3. Integral elements of Culture of Care[4].

When robust systems are in place and a positive workplace culture is well established, they collectively foster a strong CoC (Figure 3)[4]. A strong CoC directly supports high-quality science by promoting accuracy, consistency, and reliability in research practices. In the context of animal research, this culture prioritizes animal welfare, ensuring that animals are healthy, well cared for, and experience minimal stress. Happier, well-managed animals produce more reliable and reproducible data, which in turn leads to better scientific outcomes. This creates a reinforcing cycle: good animal welfare supports good science, and good science further justifies and

strengthens a CoC. Beyond scientific outcomes, a strong CoC also benefits society as a whole. High-quality, ethically conducted research contributes to scientific advancement, medical progress, and public trust. At the same time, a genuine CoC extends to the people involved in the work, supporting staff wellbeing, encouraging responsibility and accountability, and promoting a safe, respectful, and ethical working environment.

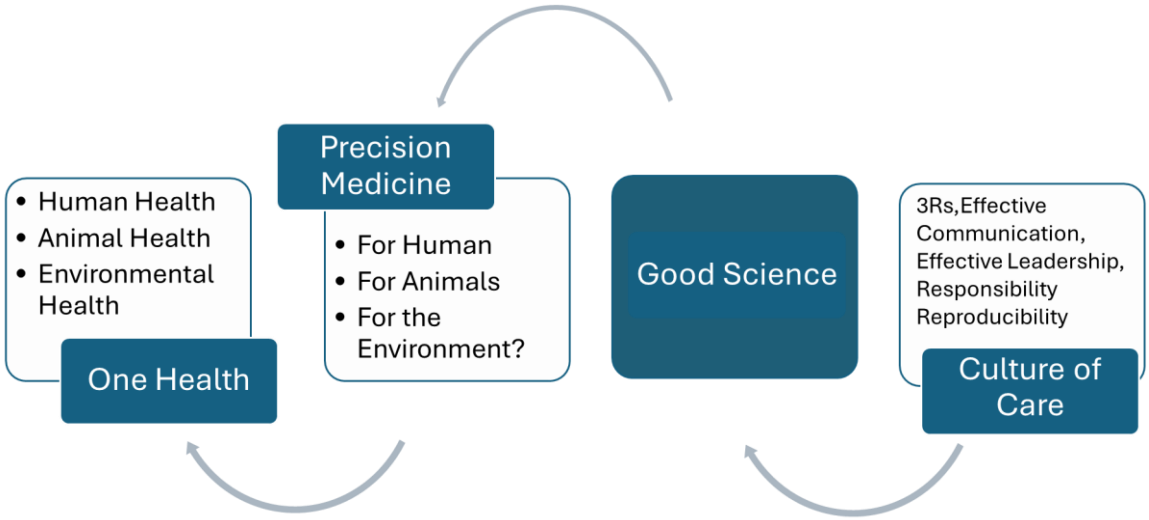

Figure 4. One Health, Precision medicine, Culture of Care are not separate concepts, they are interconnected.

In conclusion, the establishment of a strong CoC, incorporating the principles of the 3Rs, responsibility, and reproducibility, etc. is fundamental to achieving high-quality and ethically conducted animal research. Such a culture directly supports robust and reliable science, which is essential for advancing precision medicine in both humans and animals (Figure 4). Improvements in precision medicine contribute not only to better diagnosis, treatment, and prevention of disease, but also to more targeted and efficient use of resources, potentially reducing unnecessary interventions and environmental impact. By strengthening precision medicine across species, a strong CoC actively supports the One Health approach, recognizing the interconnectedness of human, animal, and environmental health. Therefore, building and sustaining a

CoC is not only critical for scientific excellence and animal welfare, but also for promoting public trust, environmental responsibility, and long-term societal benefit in the One Health era. Thus, if precision medicine is the destination, animal research is the engine, and CoC is the fuel, then One Health is the ecosystem in which this journey takes place, where the health of humans, animals, and the environment are inseparably linked.

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- Invited guest, Prof Uthpala Jayawardena, President of Section D of Sri Lanka Association for the Advancement of Science.
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