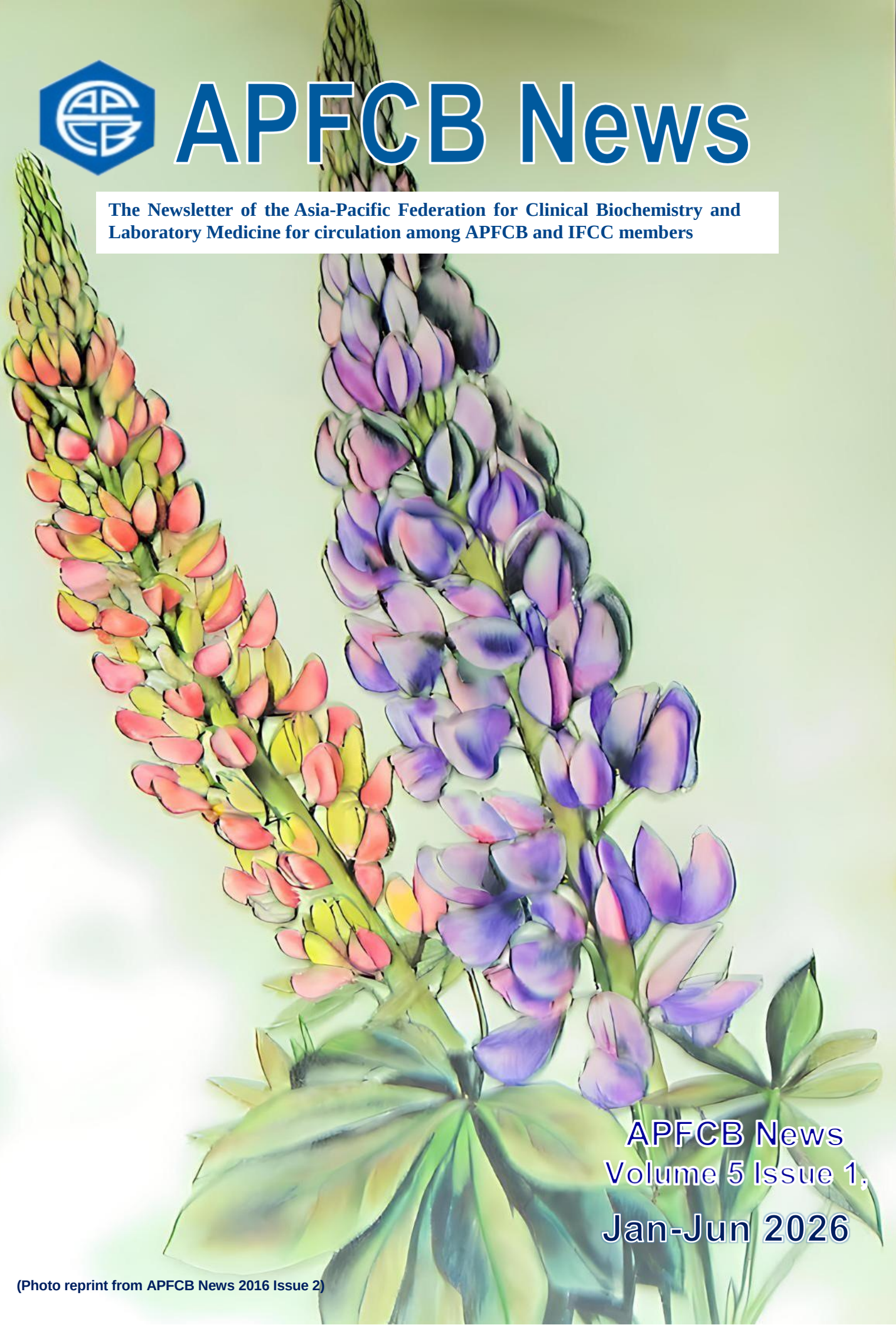
APFCB News

The Newsletter of the Asia-Pacific Federation for Clinical Biochemistry and Laboratory Medicine for circulation among APFCB and IFCC members



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Submission

The APFCB News welcomes suitable contributions for publication. These should be sent electronically to the Chief Editor. Statements of opinions are those of the contributors and are not to be construed as official statements, evaluations or endorsements by the APFCB or its official bodies.

Contact email: afpcbofficial@apfcb.org

Cover page: "Beautiful Terraced Ricefields in China". Contributed by Tan It Koon

Founding and Past President APFCB

Address

Publisher Details:
Corresponding Address for APFCB News, India:
Dr. Pradeep Kumar Dabla
Chair APFCB- Communication Publications Committee
Chief Editor APFCB News
Professor, Department of Biochemistry
G.B. Pant Institute of Postgraduate Medical Education Research (GIPMER), JLN Marg, Delhi-110002, India
Email: c-cp@apfcb.org
Head Office:APFCB, c/o Solid Track Management Pte Ltd. 150 Cecil Street, #10-06,Singapore 069543
mail: afpcbofficial@apfcb.org

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From the desk of APFCB President



President, APFCB
Dr Tony Badrick

Dear APFCB members

Welcome to this edition of the APFCB Newsletter, the first for 2026. We all make plans for our new year at this time. It is a period of reflection for the previous year's personal achievements or disappointments, as well as a time to look forward to what we can accomplish in the year ahead.

As laboratory professionals, we also reflect on what is happening in our laboratories and what we need to do to prepare ourselves for future trends. It is always difficult to forecast what may happen in five years, but there are obvious challenges ahead. The most significant gamechanger is artificial intelligence (AI). Pathology continues to evolve to cope with higher volumes, newer analytical technologies, and improved methods of managing data. AI has been incorporated into instruments to aid the analysis of digital images for many years; however, we are now seeing a rapid expansion in its applications. Our role is to understand where these applications are used in our instruments and middleware, any confidentiality implications of their use, how to validate them, and the underlying principles of the algorithms involved. In this Newsletter there is a Q&A addresses some of these issues to stimulate discussion and reflection.

Reducing laboratory waste in all its forms will also become increasingly important as governments strive to deliver sustainable healthcare. Laboratories must play an active role in this process to ensure that our expertise is used effectively to minimise waste. The Laboratory Management Committee has been very active in this area and has produced a series of educational webinars addressing this critical issue.

The Newsletter is a major initiative of the Communication and Promotion Committee. I would like to thank Dr Pradeep Kumar Dabla and his team for all their efforts in 2025 and look forward to the 2026 Editions.

Best Wishes
President, APFCB
Dr Tony Badrick

From The Desk of Chief Editor, APFCB News



Prof. Pradeep Kumar Dabla
Chief Editor, APFCB News

Dear Esteemed Colleagues,

As we reflect on the achievements of the past year and welcome New Year, I would like to express my sincere gratitude to our committee members for their unwavering dedication and invaluable contributions. Through their collective expertise and vision, we have made significant strides in integrating new programmes with C-CP such as APFCB-Webcast Programme, while continuing to strengthen our established initiatives. The cutting-edge technologies like Artificial Intelligence (AI) are paving their ways into medical laboratories, driving innovation, improving diagnostic accuracy, and enhancing patient care. AI is transforming the landscape of medical diagnostics by enabling faster, and more accurate data analysis. From genomic sequencing to imaging and routine laboratory tests, AI empowers laboratorians to make critical decisions with greater precision, reducing errors and accelerating diagnostic timelines. These technological advances directly contribute to improved patient outcomes and more efficient laboratory operations.

Equally important is AI's role in strengthening risk assessment. By leveraging predictive analytics, AI helps identify potential risks at an early stage, whether related to equipment performance, diagnostic accuracy, or safety concerns, allowing laboratories to take proactive measures and maintain the highest standards of quality.

As we step into the New Year, I encourage all of us to continue embracing AI-driven solutions, fostering collaboration, and striving for even greater achievements in laboratory excellence. Together, we are shaping a future where innovation leads the way to safer, more efficient healthcare.

Wishing all members of APFCB family a joyful, prosperous, and successful New Year 2026
Sincerely,

Prof. (Dr.) Pradeep Kumar Dabla
Chair, APFCB Communication & Publications Committee (C-CP)

Happy Reading!!
Team APFCB C-CP

APFCB Communication and Publications Committee (C-CP) Annual Report – Year 2025



Prof. Pradeep Kumar Dabla
Chief Editor, APFCB News

Members of the APFCB C-CP for the Term:

- **Chair:** Dr. Pradeep Kumar Dabla
- **Web Editor:** Dr. Deepak Parchwani
- **Social Media Coordinator:** Dr. Vivek Pant

Members:

- Dr. Ryunosuke Ohkawa
- Dr. Mingma Lhamu Sherpa
- Dr. Alireza Lotfi Kian
- Dr. Mayank Upadhyay (Corporate – QuidelOrtho)

The C-CP has taken proactive steps to enhance the federation's online visibility through the APFCB e-newsletter, social media platforms, and the official website. Over the past year, the committee has maintained robust communication channels and employed digital tools to promote the APFCB's activities across member societies within the Asia Pacific region and beyond, reaching countries affiliated with the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC).

1. Introduction

The Communication & Publications Committee (C-CP) of the Asia-Pacific Federation for Clinical Biochemistry and Laboratory Medicine (APFCB) is responsible for all communication, publication, outreach, and engagement activities of the federation. As a standing committee reporting to the Executive Board, the C-CP continues to strengthen APFCB's visibility, scientific dissemination, digital presence, and educational initiatives across the Asia-Pacific region.

This committee plays an instrumental role in formulating and overseeing system-wide policies, ensuring that all digital operations align with the federation's overarching objectives. It also spearheads the online publication of APFCB News and collaborates closely with member associations and corporate partners to foster broader engagement and dissemination of valuable educational materials and resources to professionals in laboratory medicine. In doing so, the C-CP significantly contributes to the advancement of innovative ideas, guiding member associations in the development of policies and strategies that support the federation's mission of enhancing patient care.

2. Major Activities & Achievements in 2025

2.1 APFCB Webcast & e-Learning Programme

2025 marked significant strengthening of APFCB's e-learning initiatives. Building on the success of the 2024 programme, the committee organized multiple high-impact webinars featuring international faculty.

Total Webinars Conducted in 2025: four

In 2025, the APFCB C-CP successfully conducted four high-impact webinars that attracted a large number of participants from across the Asia-Pacific region and beyond. Each webinar was highly appreciated for its scientific depth, expert faculty, and practical relevance.

- The first webinar focused on "Advancing Medical Laboratory Practices with ISO 15189:2022: The Future of Quality and Competence", moderated by Prof. (Dr.) Pradeep Kumar Dabla, featuring Dr. Tony Badrick and Prof. Tomas Zima as speakers.
- The second webinar, themed "The Interplay of Biological Factors in Chronic Disease Pathogenesis", was moderated by Prof. (Dr.) Ryunosuke Ohkawa, with expert lectures delivered by Prof. (Dr.) Nafija Serdarevic and Prof. (Dr.) Ketut Suastika.
- The third webinar, centred on "EQA and Quality Improvement practices in Resource Limited Settings", was led by moderator Dr. Sarah Jane L. Datay-lim, with scientific contributions from Prof. (Dr.) Paulo Enrico P. Belen and Prof. (Dr.) Rodelio D. Lim.
- The final webinar of the year addressed "Sustainable Laboratory Medicine", moderated by Dr. Tony Badrick, featuring Dr. Lia Partakusuma and Dr. Sohini Sengupta as speakers.

Across all sessions, the webinars received overwhelming participation and positive feedback, reflecting APFCB's growing regional impact and educational leadership. At times there were more than 4000 registrations in individual programme.

2.2 Publication Activities

The committee continued to curate, edit, and publish high-quality content for APFCB publications. Two issues of the APFCB Newsletter/e-Bulletin were released in 2025, featuring expert opinion and review articles, case discussions, interviews with emerging scientists, reports from national societies, and updates from various APFCB committees and member federations.

2.3 APFCB Website Revamp & Digital Presence

APFCB website underwent continuous updates and improvements throughout 2025. Enhancements included a more user-friendly interface, streamlined navigation, updated resource pages, and the addition of a comprehensive webinar archive with downloadable educational materials, ensuring timely and effective communication of all announcements and event updates.

2.4 Social Media Outreach

APFCB's digital presence expanded significantly in 2025 through enhanced social media activities. Regular posts highlighted scientific content, event announcements, and key updates, complemented by targeted promotional campaigns for webinars. These efforts resulted in increased engagement across multiple platforms, strengthening APFCB's visibility within the region.

Social Media Links:

- Facebook: https://www.facebook.com/APFCB/
- Twitter: https://twitter.com/APFCB_LM
- Instagram: https://www.instagram.com/apfcb_lm/
- LinkedIn: https://www.linkedin.com/company/apfcb/
- YouTube: https://www.youtube.com/channel/UCoiicTsnVX-COjklgZHQ54Q

2.5 Collaboration with Corporate Members

The C-CP continued to maintain strong and productive collaborations with APFCB's corporate partners. These partnerships supported webinar sponsorship, technical facilitation, and the development of high-quality educational resources, contributing significantly to the success of APFCB's academic initiatives.

2.6 Supports to the APFCB Executive Board

Throughout the year, the committee played a vital role in supporting the APFCB Executive Board by assisting in timely dissemination of information, preparing official communications, and coordinating outreach activities during conferences, national society events, and major scientific programs.

2.7 APFCB C-CP survey research paper publications:

Two papers are published, details are as

1. Pant V, Parchwani D, Upadhyay M, Ohkawa R, Sherpa ML, Dabla PK. Lead Toxicity Testing in the Asia-Pacific – Practices, Challenges, and Policy Insights: An APFCB Communication and Publications Committee Survey report. EJIFCC. 2026 Feb 2;37(1):113-119. PMID: 41659289; PMCID: PMC12882087.
2. Pant V, Parchwani D, Upadhyay M, Ohkawa R, Sherpa ML, Dabla PK. Urgent Call for Action: Bridging Gaps in Asia-Pacific Laboratories' Transition to ISO 15189:2022. EJIFCC. 2026 Feb 2;37(1):166-170. PMID: 41659292; PMCID: PMC12882077.

3. Future Plans & Recommendations (2026 and Beyond)

3.1. Strengthening Stakeholder Engagement

- Conduct virtual interactive sessions with APFCB member associations to gather feedback and align communication strategies.
- Establish structured pathways to incorporate suggestions into C-CP planning and educational activities.

3.2. Enhanced Survey & Feedback Mechanisms

- Continue and expand regional surveys, such as the ongoing survey on blood lead testing practices.
- Publish survey outcomes in APFCB News and use findings to refine future educational programmes.
- Develop a standardized feedback system for webinars, publications, and digital initiatives.

3.3. Diversification of APFCB Publications

- Publish a Special Issue (September) dedicated to:
  - In-house troubleshooting algorithms from APFCB member laboratories
  - Case-based problem-solving and mismatch resolution in clinical laboratories
- Launch the APFCB Podcast Series, featuring interviews with leading experts from the region.

3.4. Technology, Innovation & Digital Expansion

- Adopt modern digital tools including:
  - Advanced social media analytics
  - Targeted email communication platforms

- Develop an APFCB Mobile App to provide:
  - Easy access to publications
  - Webinar materials and updates
  - Educational resources and event notifications

3.5. Educational Programme Growth

- Expand the APFCB Webcast & e-Learning Programme with more regionally relevant topics.
- Increase participation of young scientists through mentorship, authorship, and digital engagement roles.

3.6. Enriching Scientific Content

- Include more clinical case discussions in APFCB News to strengthen practical learning.
- Curate thematic issues to address emerging trends and challenges in laboratory medicine.

3.7. Strengthening Regional & Corporate Collaborations

- Enhance partnerships with member societies and corporate partners for:
  - Educational sponsorship
  - Joint scientific activities
  - Development of high-quality digital and print resources

3.8. Standardized Communication Framework

- Develop a uniform communication model for APFCB member societies to ensure consistency, visibility, and timely information dissemination across the region.

Report compiled by:
Prof. Pradeep Kumar Dabla (Chair)

Prof. Deepak Parchwani (Member)
& Team APFCB C-CP

APFCB Congresses and Conferences Committee (C-CC) Annual Report-Year 2025



Dr. Raja Elina Raja Aziddin (MACB)
Chair of C-CC

Members of the APFCB Congresses and Conferences Committee (C-CC) for the 2025-2026 term are as listed below:

1. Dr. Raja Elina Raja Aziddin (MACB) – Chair
2. Dr Rajiv Ranjan Sinha (ACBI) – member
3. Ram Vinod Mahato, Nepalese Association for Clinical Chemistry (NACC) – member
4. Vincent Chen (SNIBE) - corporate member
5. Romina De Leon (Thermo Fisher Scientific) - corporate member

1. **APFCB auspices were granted to the following APFCB national societies for events held in 2025:**

   I. **College of Chemical Pathologists of Sri Lanka (CCPSL**) for the "10th Annual Academic Sessions 2025" which was held on the 11th-2th July 2025 at the Monarch Imperial Hotel, Colombo.The goals of the event include professional development of medical consultants, trainees and medical laboratory technologists.

   II. **Malaysian Association of Clinical biochemists (MACB)** for the "International Conference of Biochemistry, Molecular Biology and Laboratory Medicine 2025 (ICBMBLM 2025)" in conjunction with the 35th MACB Annual Conference 2025 which was held on 25-27 August, 2025 at M Hotel, Petaling Jaya, Malaysia.

The objective of the conference was to provide an avenue for members and the clinical laboratory community in Malaysia to discuss the latest scientific advancements and transformative innovations in clinical biomarker discovery, metabolic diseases, genetic research and lab technologies as well as breakthrough solutions that can be applied to reshape the field and improve patient outcomes.

In conjunction with the 35th MACB Conference, the APFCB also conducted a Pre-Conference Workshop on Method Verification on 25th August 2025, followed by a Symposium titled Building a Greener Tomorrow: Sustainability Strategies for Clinical Laboratories on Day 1 of the conference.

III. **Indonesian Association for Clinical Chemistry (IACC)**

For the event "XVII Indonesian Association for Clinical Chemistry (IACC) National Congress" held at HARRIS Hotel and Conventions Malang, East Java, Indonesia from 4-7 September, 2025.

The objective was to foster collaboration and engagement among the Central Executive Board and regional committee members, while serving as a forum for strategic decision-making, organizational development, and policy direction. The event also aimed to share the latest scientific knowledge with clinical pathologists, general practitioners, medical residents, related science graduates, laboratory owners, and medical laboratory technologists through regular Scientific Meetings featuring field experts.

IV. **Association of Medical Biochemists of India - Tamil Nadu Chapter (AMBI)**

For the event "AMBICON 2025, (32nd national conference of Association of Medical Biochemists of India)"which took place in Coimbatore, Tamil Nadu, India, from 12th to 14th December 2025.

The aim of the event was for knowledge sharing, professional development, networking and collaboration.

2. APFCB auspices were also granted to the following APFCCB national societies for events to be held in 2026:

I. Victorian Branch of **Australasian Association for Clinical Biochemistry and Laboratory Medicine (AACB)** and APFCB Working Group on Clinical Decision Support (WG-CDS) for the online webinar "Evaluating large language models as clinical laboratory test recommenders in primary and emergency care" which will be held on 18 February 2026

This webinar aims to equip laboratory professionals and clinicians with the knowledge to critically evaluate large language models as laboratory test recommenders, understand their limitations and safety risks, and define appropriate governance-led use of AI in primary and emergency care.

II. **Chinese Association for Clinical Biochemistry (CACB)** for the event "70 Years of Excellence, Leading the Future: New Frontiers in Laboratory Sciences and Medical Biotechnology Symposium", scheduled to be held on 7 March 2026 at Lecture Hall 101, National Taiwan University College of Medicine. This event is in conjunction with the Joint academic symposium with Dept. of CLSMB, NTU to celebrate 70th anniversary.

3. APFCB auspices was granted to the following APFCCB corporate member event held in 2025:

I. **Roche Diagnostics Asia-Pacific Pte Ltd** for the event "Breaking Boundaries in Clinical Mass Spectrometry" held on 25 - 26 Nov 2025 at Cordis Hotel Hong Kong.

The goal is to establish a collaborative user network to share expertise, exchange best practices, and drive advancements in the utilization of mass spectrometry.

Submitted by:
Dr. Raja Elina Raja Aziddin (MACB)
Chair of C-CC

National Society Report- HKSCC, Hong Kong

NAME OF SOCIETY	Hong Kong Society of Clinical Chemistry (HKSCC)
OFFICIAL EMAIL	hkscc@hos.com.hk
PRESIDENT	Name: Dr. Sammy PL Chen
APFCB NATIONAL REPRESENTATIVE	Name: Dr. Sammy PL Chen

Report on Society Activities

The Hong Kong Society of Clinical Chemistry (HKSCC) actively organized a number of educational activities for our membersin the past year. We arranged our Annual Scientific Meeting (ASM) on 18 January 2025. The theme of the ASM was “Advances and Challenges in Metabolomics for Laboratory Diagnostics”. Prof Amy KY Fu, Division of Life Science and State Key Laboratory of Molecular Neuroscience, the Hong Kong University of Science and Technology; the Hong Kong Center for Neurodegenerative Diseases, Hong Kong, China, delivered a keynote lecture entitled "Identifying the Blood Biomarkers of Alzheimer’s Disease: Insights for the Diagnostic Development”. This was followed by seven industrial presentations. There were twenty industrial partners participating in the industrial exhibition. The ASM was well attended by over 220 HKSCC members and guests, and was closely followed by our Annual General Meeting cum Dinner on the same evening.

Later in 2025, we hosted three lectures by invited overseas speakers

- On 3 May 2025, Professor Ming-Lung Yu, President and Chair Professor at the College of Medicine, Kaohsiung Medical University, Taiwan, presented “Beyond Biomarkers: Integrating PIVKA-II with Digital Algorithms in Hepatocellular Carcinoma.” This event was co-hosted with Roche Diagnostics HK.

- On 8 May 2025, Professor Ann M. Gronowski, Oree M. Carroll and Lillian B. Ladenson Professor in Clinical Chemistry at Washington University School of Medicine, delivered a lecture titled “An 18-Year-Old Pregnant Female with a Negative Pregnancy Test? The Analytical and Clinical Complexities of Measuring hCG.” This session was co-hosted with Chinese University of Hong Kong.

- On 2 September 2025, Associate Professor Zhong X Lu, Director of Chemical Pathology at Monash Health Pathology and Associate Professor in the Department of Medicine at Monash University, Australia, presented a lecture entitled “Interpretation of Iron Studies.” This lecture was co-hosted with Queen Elizabeth Hospital and held in conjunction with his role as external examiner for the Hong Kong College of Pathologists.

Supported by APFCB, we were honoured to have Dr Tze-Ping LOH, APFCB Travelling Lecturer organize a full-day workshop on patient-based quality control (PBQC). The workshop was held on 8 Nov 2025 at Queen Elizabeth Hospital, Kowloon, Hong Kong, and attracted a diverse audience of trainees, scientific officers and laboratory professionals from across Hong Kong. Dr Loh shared his extensive expertise on the principles and implementation of PBQC, emphasizing its role in enhancing analytical performance, reducing false alarms, and

improving long-term quality assurance in clinical laboratories. The program included interactive case studies, real-world data interpretation, and practical strategies for integrating PBQC into routine laboratory workflows. Participants expressed strong appreciation for the depth and clarity of the content, and many highlighted the workshop as one of the most impactful educational events of the year. The success of this educational event not only strengthened our collaboration with APFCB but also reaffirmed HKSCC's commitment to advancing laboratory excellence through continuous professional development.



Photo 1: Group photo of HKSCC Council Members taken at our Annual General Meeting 2025

National Society Report- AACB, Australia

NAME OF SOCIETY	Australasian Association for Clinical Biochemistry and Laboratory Medicine (AACB)
OFFICIAL SOCIETY EMAIL ADDRESS	office@aacb.asn.au
NAME OF PRESIDENT & EMAIL ADDRESS	A/Prof Ronda Greaves ronda.greaves@vcgs.org.au
NAME OF NATIONAL REPRESENTATIVE TO APFCB & EMAIL ADDRESS	A/Prof Ronda Greaves ronda.greaves@vcgs.org.au

Report submitted by: Ms Lisa King, AACB CEO

AACB Executive Board

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Ronda Greaves, Victorian Clinical Genetics Services

Past President
Greg Ward, Sullivan Nicolaides Pathology

Director - Scientific and Regulatory Affairs
Kay Weng Choy, Northern Pathology Victoria

Director - Education and Training
Wayne Rankin, SA Pathology – Adelaide

Director - Finance, Branches and Strategic Planning
Kate Driver, DiaSorin

Director - Media and Communications
Chanika Ariyawansa, Pathwest/Western Diagnostic Pathology

Chief Executive Officer
Lisa King, AACB

Scientific Session held over the last 6 months

Our branches continue to foster both learning and networking opportunities through a diverse range of activities. These included **webinars, poster sessions**, and **presentations** on topics such as Newborn Screening, QAP vs QC, bio-hacking bugs, patient-based QC, and case studies, as well as the **Roman Lecture**, featuring Prof. Mario Plebani who visited all branches over a four-week period. Branches also hosted **education days** and **quiz nights,** ensuring a vibrant mix of professional and social engagement.

AACB continues its collaboration with RCPAQAP, with a number of events over the last 6 months, including the **Industry Education Course** held in September, which equips application specialists, product support staff, and sales and marketing professionals with a comprehensive understanding of laboratory practices and standards. Additional joint activities feature guest speakers at branch meetings and the ever popular **Quality Control Satellite Meeting** at the AACB Annual Scientific Conference in New Zealand.



Photo 1

In October 2025, we held our 62nd Annual Scientific Conference in Auckland, NZ with the theme "Shedding Light on the Medical Laboratory Black Box", which highlighted the complexities and workings behind medical laboratory results – aspects that many clinical and non-clinical colleagues may not fully appreciate. The program was designed to showcase the many facets of the profession and provide delegates with valuable insights into the latest advances in laboratory medicine. The Scientific Program Committee, chaired by Dr Samarina Musaad, did a fantastic job in curating the program and securing an outstanding lineup of speakers.

The conference drew over 300 attendees, supported by more than 30 sponsors, and featured a vibrant scientific program. Delegates engaged with four plenary lectures delivered by esteemed local and international speakers, alongside ten parallel symposia covering critical areas of laboratory medicine. The program also included over 80 poster presentations, 18 oral presentations, and the ever-popular Hot Topics sessions, ensuring a rich exchange of knowledge and ideas.



Photo 2 – (from top left, across, then bottom left, across) Traditional NZ Welcome, David Curnow Plenary Lecture introduction by A/Prof Ronda Greaves, Poster Session, APFCB Travelling Lecturer, Dr Tze Ping Loh, David Curnow Plenary Lecturer, Prof Dianne Webster, delegates at the Conference Dinner at Wētā Workshop Unleashed, Auckland.

National Society Report partners put together engaging symposia, showcasing cutting-edge developments in laboratory science. The exhibition floor provided delegates with direct access to the newest technologies and products shaping the profession.

Beyond the scientific program, attendees enjoyed connecting with colleagues and friends through networking opportunities and social events.

Looking ahead to 2026

AACB has an exciting year of events planned, beginning with the annual RCPA AACB Chemical Pathology Course in February in Sydney. We are delighted to have Dr Associate Prof. Cherie Chiang present the 2026 Roman Lecture, which travels around to each AACB Branch, and in September, we have the 63rd Annual Scientific Conference, an inaugural Early Career Forum, and a two day Clinical Mass Spectrometry Satellite Meeting in Melbourne, Victoria.



Photo 3 – AACB 2026 ASC

National Society Report – JSCC Japan

NAME OF SOCIETY	Japan Society of Clinical Chemistry (JSCC)
OFFICIAL SOCIETY EMAIL ADDRESS	soeda@jscc-jp.gr.jp
NAME OF PRESIDENT & EMAIL ADDRESS	President: Takashi Miida E-mail: tmiida@juntendo.ac.jp, jscc@mc-i.co.jp
NAME OF NATIONAL REPRESENTATIVE TO APFCB & EMAIL ADDRESS	President: Takashi Miida E-mail: tmiida@juntendo.ac.jp, jscc@mc-i.co.jp

Report on the 65th Annual Meeting of the Japan Society of Clinical Chemistry

Submitted by

Kaori Soeda

Secretariat

The 65th Annual Meeting of the Japan Society of Clinical Chemistry (JSCC) was held from 7–9 November 2025 at Wink Aichi in Nagoya, Japan. The meeting was led by Professor Kuniaki Saito, Vice President of Fujita Health University, who served as the Meeting President, with strong support from Professor Hiroyasu Ito, who acted as the Vice President of the meeting. In addition, the meeting received significant academic support from Fujita Health University, including a symposium chaired by Dr. Yukio Yuzawa, Vice Chair of the Fujita Academy Board, which further strengthened the scientific depth of the event.

Organized under the theme “Creation and Utilization of Knowledge in Clinical Chemistry,” the meeting brought together a wide spectrum of participants, including researchers, clinicians, laboratory technologists, educators, students, and international guests. This year’s program emphasized both scientific innovation and the nurturing of the next generation of clinical chemists.

Across the three-day event, participants engaged in a wide range of scientific activities, including plenary lectures, symposia, oral and poster presentations, technical workshops, and educational sessions. The meeting served as a valuable forum for exchanging new findings, discussing emerging methodologies, and building collaborations within Japan and across the Asia-Pacific region.

The scientific sessions covered diverse topics such as clinical biomarkers, lipid and lipoprotein research, analytical technologies, diagnostic innovation, and quality assurance in laboratory medicine. The oral and poster sessions featured a high number of early-career presenters, contributing to lively and productive discussion throughout the venue.

A major highlight of the scientific program was the invited lecture by Dr. Nadar Rifai, who provided a global perspective on emerging challenges and future directions in laboratory medicine. The lecture addressed harmonization efforts, evolving quality management systems, and new opportunities driven by technological innovation. His presentation underscored the importance of international engagement and reaffirmed JSCC’s connection with the wider Asia-Pacific scientific community.



Photo 1: Dr. Nadar Rifai in the JSCC international session.

C presentations highlighted the growing strength of young clinical chemistry researchers in Japan. During the closing ceremony, several outstanding presenters were awarded the Excellent Presentation Awards in recognition of their scientific contributions.



Photo 2: Award-winning student presenters receiving certificates on stage

These achievements demonstrated the emerging talent within the field and emphasized JSCC's dedication to providing opportunities for early-career scientists. The society remains committed to supporting their growth and looks forward to their continued contributions both domestically and internationally.

The conference wascharacterized by a collegial and energetic atmosphere, with active engagement among participants across all career stages. The successful execution of the event was made possible through the efforts of the organizing committee, faculty members, chairs, supporting institutions, and volunteers. A commemorative photograph was taken to recognize the collective contributions of these individuals.



Photo 3: Organizing committee and contributors gathered for a group photo.

The 65th Annual Meeting of JSCC successfully integrated scientific excellence, international collaboration, and strong support for young researcher development. The combination of vibrant student participation, Dr. Nadar's inspiring international lecture, and active scientific discussion affirmed JSCC's important role in shaping the future of clinical chemistry. The society will continue to foster innovation, strengthen global partnerships, and support the next generation of clinical chemists who will lead the advancement of laboratory medicine across the Asia-Pacific region.



National Society Report- SACB, Singapore

Name of Society	Singapore Association of Clinical Biochemists (SACB) (www.sacb.org.sg)
President (APFCB Representative)	Dr Leslie Lam Email: leslie.lam@parkwaylabs.com.sg
Vice-President	Mr Johnson Setoh
Treasurer	Dr Tan Jun Guan
Secretary	Dr Kho Shu Hui
Assistant Secretary	Ms Chong Ai Teng
Council Members	Ms Joanne Lee Ms Ummi Kulsum Ms Siti Rahmah
Co-opted members	Dr Shaun Tan Ms Andrea Goh Ms Ho Mun Jun

Submitted by:

CHONG AI TENG

Principal Medical Lab Scientist, Laboratory Medicine
NATIONAL UNIVERSITY HOSPITAL
Singapore

SACB's Annual Learning Series: A Resounding Success!

The Singapore Association of Clinical Biochemists (SACB) proudly concluded its ten-week education programme, held every Wednesday from 10 September to 12 November 2025. This year's programme embraced a dynamic hybrid format—combining Zoom sessions with in-person learning—giving healthcare professionals the flexibility to join in the way that suited them best.

The result? Exceptional engagement and enriched learning experiences across the sector!

With 173 participants from diverse healthcare institutions island-wide, the series highlighted the strong appetite for continuous professional development in clinical biochemistry. SACB remains committed to fostering knowledge-sharing and advancing excellence in the field.

Thank you to all who joined us—see you next year!

Date	Topic	Speaker
10 Sept 2025	Cardiac Markers – What Technologists Need to Know?	Mr Nicky Josman Senior Medical Laboratory Scientist KK Women's and Children's Hospital
17 Sept 2025	POCT Evaluation & CAP Accreditation. A Practical Experience	Ms Siti Rahmah Principal Medical Laboratory Scientist Changi General Hospital
24 Sept 2025	Trace Element Analysis & Inductively Coupled Plasma Mass Spectrometry	Ms Carol Tan Senior Principal Medical Laboratory Scientist Singapore General Hospital

8 Oct 2025	Behind the Scenes of LIS	Mr Steven Tsai Principal LIS Officer Khoo Teck Puat Hospital
15 Oct 2025	How to Start a New Lab Test? A Practical Step by Step Approach	Ms Pallavi Chincholkar Deputy Manager Parkway Labs
22 Oct 2025	All about Sodium – More Than Just a Pinch of Salt	Dr Sheila Soh Registrar National University Hospital
29 Oct 2025	Thyroid Function – What Technologists Need to Know?	Dr Heng Teng Hiang Medical Officer National University Hospital
5 Nov 2025	Clinical Cases: Pearls of Wisdom	Dr Michael Lau Registrar Changi General Hospital
12 Nov 2025	Professional and Career Development of MLT/MLS	Dr Shirlena Soh Head Lab Science National University Hospital

Driving Knowledge Forward: SACB's Commitment to Learning

SACB continues to champion professional growth through dynamic collaborations with industry leaders. This year, we hosted a series of educational initiatives designed to keep the laboratory medicine community at the forefront of innovation.

These events opened doors to cutting-edge technologies, innovative methodologies, and best practices in clinical biochemistry, creating a vibrant platform for knowledge exchange between healthcare professionals and industry experts. Together, we are shaping the future of laboratory medicine—one learning opportunity at a time.

World Hypertension Day Clinical Meeting

SACB proudly partnered with Diasorin on 14 June 2025 to commemorate World Hypertension Day through a hybrid educational event that united experts and professionals worldwide.

With 128 participants joining physically and online from 13 countries, the event reflected our shared commitment to advancing clinical knowledge. Attendees included:

- 68% laboratory professionals
- 13% clinicians
- 19% industry representatives

The program featured thought-provoking presentations by leading experts:

- Primary Aldosteronism: Lessons from Clinics, Cohorts and Consumers A/Prof Jun Yang, Consultant Endocrinologist, Monash Health
- Screening and Diagnosis of Primary Aldosteronism: Current and Future Practice in Vietnam Dr Tran Viet Thang, University Medical Center, Ho Chi Minh, Vietnam
- Aldosterone Renin Ratio Sample Processing and Reporting: Recommendations from the Aldosterone Renin Ratio Harmonisation (ARRh) Working Group Dr Greg Ward, Australasian Association for Clinical Biochemistry and Laboratory Medicine

This collaborative event provided a platform for sharing emerging insights, best practices, and innovative approaches to hypertension management.

Advancing Specimen Management across Disciplines

SACB and Becton Dickinson (BD) collaborated to host an in-person event bringing together leaders in Laboratory Medicine and Nursing to explore how modern specimen management is transforming clinical workflows and driving patient safety.

The event, held on 4 October 2025 was attended by local and overseas participants. The highlights of the event included:

- ☑ Clinical excellence in specimen handling
- ☑ Automation for streamlined workflows
- ☑ Digital tools for quality and compliance

That wraps up an exciting few months of SACB events!

We sincerely thank everyone who joined us in advancing knowledge and fostering collaboration across laboratory medicine, making these events a resounding success.

📅 Mark your calendars for our next big event:

SACB Annual Scientific Meeting & Annual General Meeting

11 April 2026 – Stay tuned for details!

National Society Report- PCQACL, Philippine

NAME OF SOCIETY	Philippine Council for Quality Assurance in Clinical Laboratories (PCQACL)
OFFICIAL SOCIETY EMAIL ADDRESS	secretariat.pcqacl@gmail.com
NAME OF PRESIDENT & EMAIL ADDRESS	President: Dr. Anacleta P. Valdez E-mail: secretariat.pcqacl@gmail.com
NAME OF NATIONAL REPRESENTATIVE TO APFCB & EMAIL ADDRESS	President: Dr. Anacleta P. Valdez E-mail: secretariat.pcqacl@gmail.com

Philippine Council for Quality Assurance in Clinical Laboratories (PCQACL) Regional report: Major Continuing Medical Education activities for 2025

Submitted by: Sarah Jane L. Datay-Lim, MD, FPSP

This year, the Philippine Council for Quality Assurance in Clinical Laboratories (PCQACL) proudly celebrates its 25th anniversary. In line with this milestone, the organization conducted several significant continuing medical education activities aimed at advancing professional competence and supporting the ongoing development of its members and laboratory professionals throughout the Philippines.

1. **"PCQACL MASTERCLASS SERIES on IQC Inside Lab: Driving Excellence Through Internal Quality Control"**



Figure 1: Poster of the event

The PCQACL Masterclass Series on *IQC Inside the Lab: Driving Excellence Through Internal Quality Control* was conducted as a hybrid event on August 15, 2025. The activity was well attended, with 111 onsite participants and 570 online participants, composed of both physicians and medical technologists.

This event also marked PCQACL's participation in the 3-day Philippine Medical Laboratory Expo held from August 13-15, 2025 at the SMX Convention Center, Pasay City.



Figure 2: PCQACL officers and secretariat at the exhibitors' booth of PhilMedical Expo, SMX Convention Center, Pasay City, Philippines

The morning sessions featured expert-led lectures focusing on the fundamentals and practical applications of internal quality control. Lecture 1, *Basic Laboratory Statistics*, was delivered by Dr. Emilio Villanueva III, followed by Lecture 2, Basics of Quality Control, Westgard Rules, and Interpretation, presented by Dr. Paulo Enrico P. Belen. Lecture 3, *IQC Troubleshooting and Best Practices*, was given by Ms. Charity Jomento and included hands-on exercises emphasizing practical quality control approaches prior to the lunch break.



Figure 3: One of the morning session speakers, Ms. Charity Jomento delivered her lecture on IQC troubleshooting followed by an interactive session with the participants

The afternoon sessions continued with Lecture 4, IQC for Point-of-Care Testing (POCT), presented by Ms. Harriet Garcia, RMT, and Lecture 5, IQC for Blood Banking, delivered by Prof. David Roxby. An interactive open forum followed, allowing participants to engage directly with all the resource speakers. The program concluded with the final lecture, Advanced QC Validation of New Tests and Analyzers in Chemistry, presented by Dr. Rodelio Lim. Overall, the event was a full day of meaningful learning, knowledge exchange, and professional engagement, made possible through the support of sponsors SBSI, Randox, and QuidelOrtho.

(Video highlights of the event maybe accessed through PCQACL's YouTube channel: https://www.youtube.com/watch?v=0RGIfzCqPvM)





Figure 4: Dr. Rodelio Lim gave the last lecture and Dr. Annie P. Valdez delivered the closing remarks at the end of the program

2. **Pre-convention seminars: "Pathway to ISO 15189 Accreditation: Quality & Competence in Medical Laboratories" and "Optimizing Laboratory Performance: External Quality Assessment (EQA) Strategies"**

Two simultaneous hybrid pre-convention seminars were conducted on October 7, 2025, at the Crowne Plaza Hotel, Ortigas. These activities were designed in response to the evolving needs of laboratory professionals and aimed to further strengthen quality and competence in medical laboratory practice.

Optimizing Laboratory Performance: External Quality Assessment (EQA) Strategies

The EQA seminar featured a comprehensive program covering both theoretical and practical aspects of external quality assessment. The morning sessions included Lecture 1, *Understanding EQA Reports: Numbers and Statistics Review*, presented by Dr. Emilio Villanueva III; Lecture 2, *The EQA Cycle: From Sample Receipt to Corrective Action*, delivered by Mr. Daniel Vance; and Lecture 3, *Common Errors in Laboratory Testing Revealed Through EQA*, which included hands-on exercises and was facilitated by Mr. Robert G. Manaois.



Figure 5: Dr. Emilio Villanueva, III opened the seminar with a review of laboratory statistics

In the afternoon, Lecture 4, Updates from the NRL NEQAS, was presented by Dr. Catherine Kaori Calingo, followed by Lecture 5, Regulatory and Accreditation Requirements, by Dr. Dario Defensor. The seminar concluded with a bonus lecture entitled Developing an In-House EQA or Inter-Laboratory Comparison Program, delivered by Ms. Margarette F. Magdurulang.

Pathway to ISO 15189 Accreditation: Quality and Competence in Medical Laboratories

The parallel seminar on ISO 15189 accreditation was likewise well attended by both onsite and online participants. Following a brief opening program, the morning scientific sessions commenced with Lecture 1, Overview of ISO 15189:2022: Purpose, Scope, Structure, and Changes from Previous Editions, presented by Mr. Marlon A. Macadamia. This was followed by Lecture 2, Key Technical Requirements: Personnel, Facilities, Equipment, and Process Control, delivered by Ms. Ailyn Manglicmot-Yabes, and Lecture 3, Key Management Requirements: Organizational Structure, Document Control, Risk Management, and Continual Improvement. An interactive open forum moderated by the session chair was held prior to the lunch break.



Figure 6: The other seminar opened with an expert from the Department of Trade and Industry, Engr. Malon A. Macadamia. Officers of PCQACL gratefully presented certificate of appreciation in this photo.

The afternoon sessions included Lecture 4, Steps to Accreditation: Gap Analysis, Documentation, Training, and Internal Audits, presented by Ms. Ana B. Opeda; Lecture 5, Common Pitfalls and How to Overcome Them, by Mr. Edsel Allan Salonga, RMT; and Lecture 6, Risk Assessment and Management, delivered by Dr. Gerald Tejada. Similar to the morning session, the open forum in the afternoon was highly interactive, with participants actively raising questions that were thoroughly addressed by the resource speakers.



Figure 7: Mr. Edsel Allan Salonga gave a lecture to the onsite participants in the afternoon.

3. Annual Convention: "Radiating Excellence: 25 years of Quality Clinical Laboratory Services"

The highlight of the year was the three-day PCQACL Convention, which featured a comprehensive scientific program alongside valuable opportunities for professional networking and collegial interaction among laboratory professionals from across the Philippines. The convention was held on October 8-10, 2025 at the Crowne Plaza Hotel, Ortigas, and was conducted in a hybrid format, with participation from over 1,200 delegates both onsite and online.

Distinguished international guest speakers, IFCC Visiting Lecturers, Dr. Tze Ping Loh and Prof. Montserrat Blanes, graced the event. They participated in the opening ceremonies on Day 1 and delivered insightful plenary lectures throughout the convention, sharing global perspectives and best practices in laboratory medicine. The opening ceremonies were both colorful and meaningful, highlighted by the launch of the PCQACL 25th Anniversary coffee table book, the conferment of recognition and awards, and special entertainment presentations, all in celebration of the Council's silver anniversary.



Figure 8: Ribbon cutting ceremonies with PCQACL officers, Prof. Blanes and Dr. Loh Figure 8. Ribbon cutting ceremonies with PCQACL officers, Prof. Blanes and Dr. Loh



Figure 9: Group photo of PCQACL officers, board of trustees and committees

The scientific sessions were aligned with the convention theme and were organized into six focused and meaningful blocks: Block 1: Excellence in Innovation – Pushing the Boundaries of Technology; Block 2: Excellence in Sustainability; Block 3: Excellence in Collaboration; Block 4: Excellence in Navigating the New Era; Block 5: Excellence in Resiliency and Growth – Well-being and Lifestyle; and Block 6: Culture of Excellence – Focus on Leadership and Management.

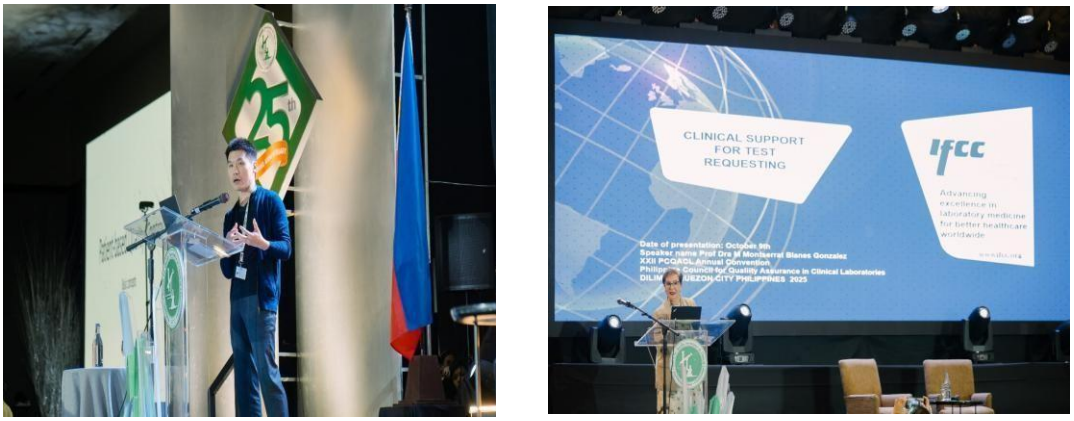


Figure 10: Top – Dr. Tze Ping Loh during his lecture on Day 1; Bottom – Prof. Montserrat Blanes delivered her first lecture on Day 2.

Each block featured a well-balanced mix of lectures and panel discussions, thoughtfully designed to engage participants and address current and emerging issues relevant to laboratory practice. The program was enriched by the participation of numerous invited, highly respected, and distinguished local and international speakers, representatives from the local regulatory bodies, who shared valuable insights and best practices, contributing significantly to the overall success of the scientific sessions.



Figure 11: Fun group photo with the celebrity entertainers Ms. Tuesday Vargas and Ms. Kakai Bautista during the Fellowship night.

Other notable highlights of the convention included the Best Practices Contest, where quality improvement projects from various institutions were submitted and presented. This year recorded the highest number of entries to date, with five (5) outstanding projects selected for final judging. Day 2 featured a vibrant Fellowship Night, with performances by special guests and entertainers, fostering camaraderie and strengthening professional relationships among laboratory practitioners. The convention formally concluded on Day 3 with the announcement of the winners of the Best Practices Contest, newly elected officers and closing messages that underscored PCQACL's continued commitment to excellence, leadership, and service in laboratory medicine.

NATIONAL SOCIETY REPORT- CACB Taiwan

NAME OF SOCIETY	Chinese Association for Clinical Biochemistry (CACB-Taiwan)
OFFICIAL SOCIETY EMAIL ADDRESS	office@cacb.org.tw
NAME OF PRESIDENT & EMAIL ADDRESS	Sandy Huey-Jen Hsu sandyhsu@ntu.edu.tw
NAME OF NATIONAL REPRESENTATIVE TO APFCB & EMAIL ADDRESS	Woei-horng Fang whfang@ntu.edu.tw

Submitted by:

Dr Woei-horng Fang, Taiwan

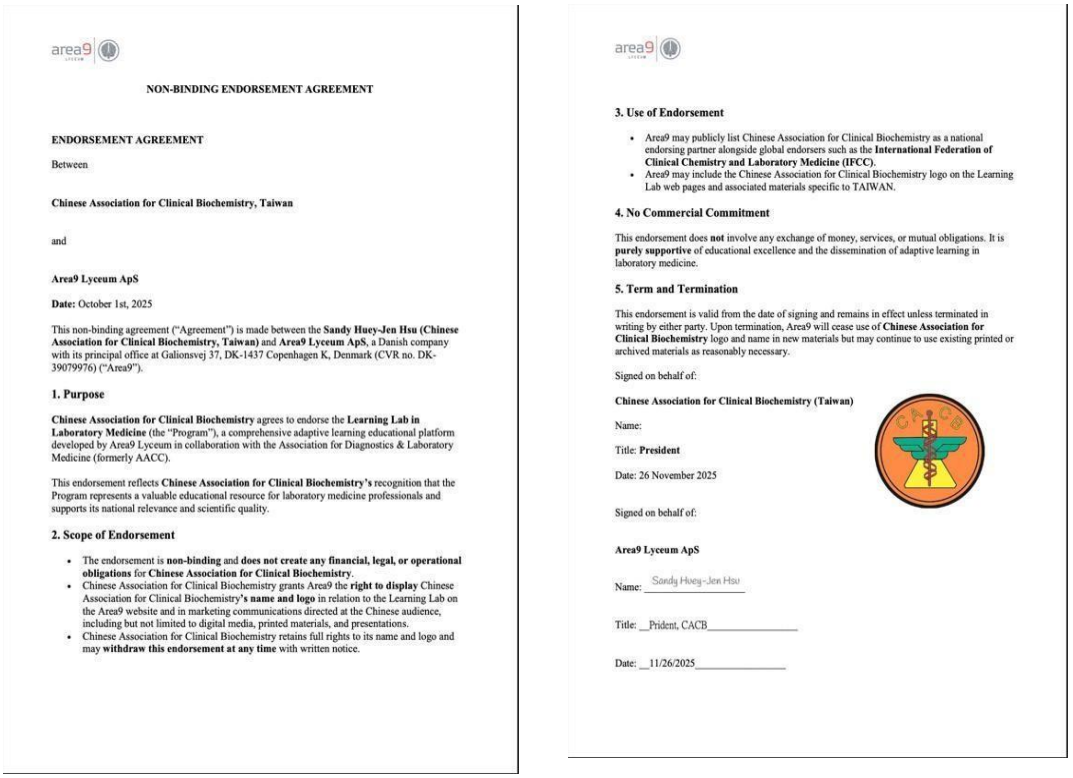
REPORT ON SOCIETY ACTIVITIES

1. CACB-Taiwan Joins IFCC Learning Lab Initiative for Traditional Chinese version

The CACB-Taiwan is pleased to announce that we are now a supporting group for the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) Learning Lab, which was established in collaboration with Area9 Lyceum. Professor Nader Rifai, the new President-elect of the IFCC, requested that CACB-Taiwan assist in disseminating information about this valuable learning tool to our community, and this partnership was established as a result.

The IFCC Learning Lab is a comprehensive learning website dedicated to laboratory medicine education. Currently, it offers over 130 high-level classes and 103 classes specifically designed for medical laboratory scientists (MLS). The IFCC backs all classes, they don't cost users anything, and they get updates every three years to keep them correct and up-to-date. The site is being translated into 11 languages and their corresponding versions, such as Traditional Chinese. About 600 translated classes are already out.

The Learning Lab was assembled by over 500 lab medicine experts from 42 countries and has reached nearly 19,000 users in 156 countries. CACB-Taiwan is proud to back this worldwide learning effort and is excited to push ongoing learning, career growth, and working together around the world among our members thanks to this partnership.



NON-BINDING ENDORSEMENT AGREEMENT

ENDORSEMENT AGREEMENT

Between

Chinese Association for Clinical Biochemistry, Taiwan

and

Area9 Lyceum ApS

Date: October 1st, 2025

This non-binding agreement ("Agreement") is made between the **Sandy Huey-Jen Hsu (Chinese Association for Clinical Biochemistry, Taiwan)** and **Area9 Lyceum ApS**, a Danish company with its principal office at Galionsvej 37, DK-1437 Copenhagen K, Denmark (CVR no. DK-39079976) ("Area9").

1. Purpose

Chinese Association for Clinical Biochemistry agrees to endorse the **Learning Lab in Laboratory Medicine** (the "Program"), a comprehensive adaptive learning educational platform developed by Area9 Lyceum in collaboration with the Association for Diagnostics & Laboratory Medicine (formerly AACC).

This endorsement reflects **Chinese Association for Clinical Biochemistry's** recognition that the Program represents a valuable educational resource for laboratory medicine professionals and supports its national relevance and scientific quality.

2. Scope of Endorsement

- The endorsement is **non-binding** and **does not create any financial, legal, or operational obligations** for **Chinese Association for Clinical Biochemistry**.
- Chinese Association for Clinical Biochemistry grants Area9 the **right to display** Chinese Association for Clinical Biochemistry**'s name and logo** in relation to the Learning Lab on the Area9 website and in marketing communications directed at the Chinese audience, including but not limited to digital media, printed materials, and presentations.
- Chinese Association for Clinical Biochemistry retains full rights to its name and logo and may **withdraw this endorsement at any time** with written notice.

3. Use of Endorsement

- Area9 may publicly list Chinese Association for Clinical Biochemistry as a national endorsing partner alongside global endorsers such as the **International Federation of Clinical Chemistry and Laboratory Medicine (IFCC)**.
- Area9 may include the Chinese Association for Clinical Biochemistry logo on the Learning Lab web pages and associated materials specific to TAIWAN.

4. No Commercial Commitment

This endorsement does **not** involve any exchange of money, services, or mutual obligations. It is **purely supportive** of educational excellence and the dissemination of adaptive learning in laboratory medicine.

5. Term and Termination

This endorsement is valid from the date of signing and remains in effect unless terminated in writing by either party. Upon termination, Area9 will cease use of **Chinese Association for Clinical Biochemistry** logo and name in new materials but may continue to use existing printed or archived materials as reasonably necessary.

Signed on behalf of:

Chinese Association for Clinical Biochemistry (Taiwan)

Name:

Title: **President**

Date: 26 November 2025

Signed on behalf of:

Area9 Lyceum ApS

Name: Sandy Huey-Jen Hsu

Title: Prident, CACB

Date: 11/26/2025

Photo 1

2. The 40th Joint Annual Conference of Biomedical Science

CACB-Taiwan is co-sponsoring the 40th Joint Annual Conference of Biomedical Science (JACBS 2026), a top biomedical get-together in Taiwan. The first Congress organizing Committee meeting scheduled this big event on 21-22 March 2026, at the National Defense Medical Center, Taipei. The conference will gather prominent scholars and researchers from various biomedical fields to share new scientific discoveries, facilitate collaboration, and showcase innovative advancements, all centered on the theme of Innovative Healthcare and Biomedical Technologies in the AI Age. CACB-Taiwan is pleased to support this major annual scientific event and welcome all of our members to come.



Photo 2

3. Co-sponsoring activity of the Department of Clinical Laboratory Sciences and Medical Biotechnology (CLSMB) at National Taiwan University

To reach out the future generations in the field of Clinical Biochemistry and Laboratory Science, CACB-Taiwan co-sponsored the Department of Clinical Laboratory Sciences and Medical Biotechnology (CLSMB) at National Taiwan University in hosting a two-day, one-night orientation retreat at Tamkang Farm on September 6-7, 2025. The event welcomed new graduate students in the 2025-2026 academic year and promoted interaction among faculty, students, and research groups. The program featured new student introductions, research presentations, academic discussions, and team-building activities to spark research enthusiasm, strengthen cross-cohort and cross-laboratory connections, and support students' future academic development. A session of Introduction of CACB was also included to promote and encourage students to participate CACB future activities.



Photo 3





Photo 4

National Society Report- AMBI, India

32nd Annual Conference, AMBICON 2025, December 12 - 14, PSG Institute of Medical Sciences and Research, Coimbatore, Tamil Nadu, India

"Next Gen Biochemistry"

NAME OF THE SOCIETY	Association of Medical Biochemists of India (AMBI)
OFFICIAL SOCIETY EMAIL ADDRESS	drvgovindaraju@gmail.com
NAME OF NATIONAL REPRESENTATIVE TO APFCB & EMAIL ADDRESS	Dr Shanthi Naidu Kamatham, naidukambi@gmail.com

Submitted by:

Dr. Anitha Devanath, Honorary Secretary, Association of Medical Biochemists of India

"CONFERENCE REPORT"

AMBICON 2025, the 32nd Annual conference of the Association of Medical Biochemists of India was the third AMBICON hosted by the Tamil Nadu chapter. AMBICON 2025 marked a landmark gathering of biochemists from across the country, bringing together academia, clinicians, researchers, educators, industry partners, and students under the theme **Next Gen Biochemistry**. This edition of the annual national conference saw overwhelming participation, with **931 registered delegates** and **418 participants** across 20 hands-on preconference workshops—reflecting the vibrant scientific and professional community of Medical Biochemistry in India.



Photo 1



Photo 2

Inauguration Ceremony

The conference was inaugurated by **Dr K Narayanasamy**, Hon'ble Vice-Chancellor, The Tamil Nadu Dr MGR Medical University.



Photo 3



Photo 4

The ceremony featured several notable releases:

- **Conference Souvenir** and **Encoding AMBI: Memory Lane** – Released by the President, AMBI; first copy received by the Chief Guest
- **Medical Biochemistry: Key Concepts and Clinical Applications** by *Dr Kavitha Subramanian* – Released by the Chief Guest
- **Reasoning in Medical Biochemistry** by *Dr Dhivya Manickam, Dr Anithasri Anbalagan & Dr Suryapriya Rajendran* – Released by the Chief Guest
- **AMBI Tamil Nadu Chapter Logo & Official Website** – Inaugurated by the Chief Guest

The AMBI fellowship was awarded to Dr M Ramadevi and Dr Biswajit Sah for their exemplary contribution towards AMBI.



Photo 5



Photo 6

Scientific Programme

AMBICON 2025 presented a rich, multidimensional academic experience:

Plenary Talks

- **Integrating Rapid NGS into Clinical Laboratory** – Dr VL Ramprasad
- **Overview of Volatilomics in Clinical Pathology** – Prof Sergio Bernardini, University of Tor Vergata, Rome (IFCC-ETD)
- **Biomarkers of Alzheimer's disease -** Dr S Danalakshmi, Senior consultant and Head Clinical biochemistry, Apollo Central Reference Laboratory, Chennai

- **Training Tomorrow's Clinical Biochemists: Lessons from Nine Years of a Structured Instrumentation Workshop -** Dr Sumitra G, Professor, PSG IMSR
- **Maternal iron deficiency in early pregnancy impacted placental iron homeostasis, with possible compromise of fetal iron status -** Dr Molly Jacob, Professor, Christian Medical College, Vellore



Photo 7



Photo 8



Photo 9

Thematic Parallel Sessions

Ten parallel scientific tracks were curated to align with the theme *Next Generation Biochemistry*, covering advances in molecular diagnostics, mass spectrometry, metabolomics, medical education, quality systems, lab management, and emerging technologies.

Spotlight Talks (New Format)

A first-ever introduction at AMBICON—a series of **5-minute curated video presentations with 2-minute live Q&A**, showcasing ideas that inspire, innovate, or challenge current practice.

Scientific Competitions & Engagements

- **Award Paper Session** featuring six outstanding research papers
- **PG Quiz**, a highlight event with enthusiastic participation
- **Escape Room Activity**, designed as an innovative learning experience
- **450+ research presentations** across oral and poster categories

The conference was held under the aegis of International Federation of Clinical Chemistry (IFCC) and Asia-Pacific Federation of Clinical Biochemistry (APFCB). The academic program, featuring renowned national and international speakers, including IFCC visiting lecturers, was very much appreciated.



Photo 10



Photo 11

Oration	Title	Speaker
Dr C Sita Devi Oration	Tandem Mass Spectrometry in Paediatric Metabolic Disorders	Dr K Pramila (Chennai)
Dr B Sadasivudu Oration	Role of Clinical Biochemistry in Personalised Medicine	Dr M Ramadevi (Hyderabad)
Dr S Gopalkrishnan Oration	The New Age Biochemist of the Digital Era; Beyond the Classroom and Clinical Lab	Dr VK Ramadesikan (Chennai)
Dr Akhouri S S Sinha Presidential Oration	Bridging Gaps for Future Innovations in Clinical Biochemistry	Dr Pullaiah Akinepalli (Telangana)
Dr Sheela Devi Kodliwadmath Oration	Gut Metabolism in Health and Disease	Dr K Ramadevi (Chennai)
Dr A S Saini Oration	Applications of Electrophoresis in Biochemistry	Dr Rachana Sabharwal (Jammu)

We express our gratitude to the IFCC for their support in making this program a remarkable success and look forward to continued collaboration in future initiatives.



Photo 12



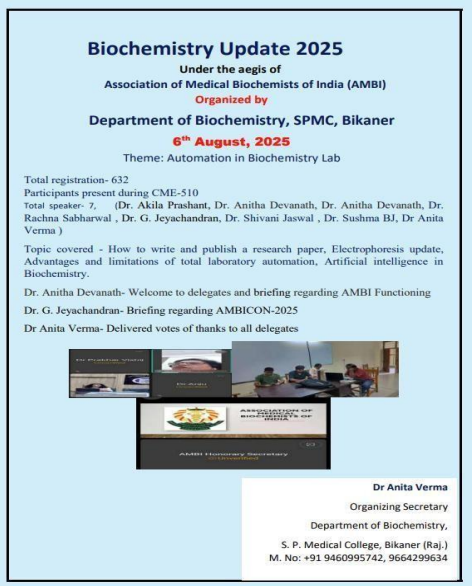
Photo 13

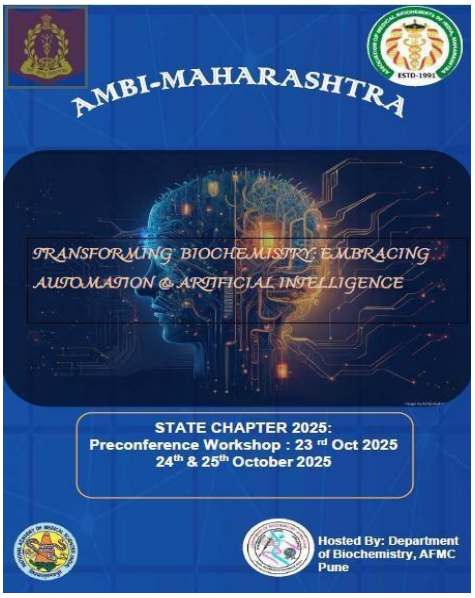
Pre-conference Workshop was held on 11.12.2025

- ✓ Next Generation Sequencing
  - Hands-on training in Sanger's Sequencing
  - Decoding Genomes: NGS & Sanger for Clinical & Research Applications- Simulation based
- ✓ Mass Spectrometry
  - Hands-on training in Liquid Chromatography – Mass Spectrometry
  - Hands-on training in Inductively Coupled Plasma – Mass Spectrometry
  - Unlocking Mass Spectrometry: Hands-on Data Analysis for Clinical & Research Applications
- ✓ Metabolomics
  - Omics: Foundations & Applications of Proteomics & Lipidomics: A Hands-on Workshop in Data Analysis
  - Fourier Transform Infrared Spectroscopy – Demonstration
- ✓ Lab Management
  - Method Validation and Verification
  - Good Clinical Laboratory Practice: Elevating Quality & Compliance in Clinical Biochemistry
  - Fast and Fabulous: Capillary Electrophoresis in Action (Case-based discussions)
  - R for Next-Gen Biochemists
  - Learn AI with No-Code Tools: A Hands-on Guide for next Gen Clinical Biochemists
  - Navigating Precision: A Hands-On Workshop on Estimation & Application of Measurement Uncertainty (MU)
  - Skill lab-based case Scenarios
  - Blueprint to bench: designing and establishing a modern clinical laboratory
  - HPLC/Thalassemia: Importance of screening and hands-on Training
  - Integrated QC Workshop

- ✓ Medical Education
  - EPAs Demystified: Revolutionizing Biochemistry Education
  - Game–Based Learning in Medical Education

Report on Branch Academic Activities







Department of Biochemistry, ABVIMS and Dr RML Hospital, New Delhi conducted a CME On 22.08.2025 under the leadership of Dr Sandhya Lal (organizing Secretary) Topic: From Variability to Reliability: A Quality Centered Approach using Six Sigma and EQAS

Department of Biochemistry, ESIC Medical College & Hospital, Sanathnagar, Hyderabad, Telangana State Chapter organised a CME on "Electrophoresis RRR (Run, Read, Report)- From Bands to Breakthrough" on 29.08.2025 under the leadership of Dr V Sampath Kumar (Organizing Secretary)

Department of Biochemistry, Sri Aurobindo Medical College & P.G. Institute organized Panel discussion: Journay to Eldorado of Biochemistry on 06.09.2025 Under the leadership Dr Kavitha Dharwadkar (Organizing Chairperson)

Department of Biochemistry, VMMC and Safdarjung Hospital, New Delhi organized CME on 28.08.2025 under the leadership of Dr Sukanya Gangopadhyay (Organizing Secretary)
Topic: Digital Era Biochemist: Embracing Technology in Clinical Research and Teaching Domains

Department of Biochemistry, Bankura Sammilani Medical College, Bankura organized a workshop on First time Right: Strengthening Pre-analytical quality through ISO 20568:2023 on 13.11.2025
Under the leadership of Dr Priyanka Datta (Organizing Secretary)

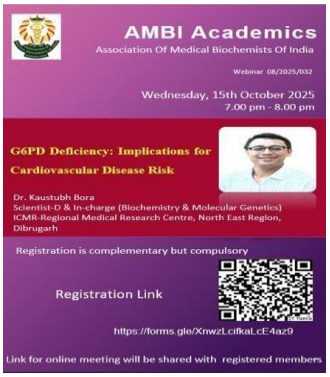
Department of Biochemistry, MAMC, New Delhi organized a CME on Method Validation & Verification: The Cornerstone of reliable Lab Results on 18.11.2025 Under the leadership of Dr Anubhuti (Organizing Secretary)

International Pathology & laboratory Medicine Course organized by Dept of Laboratory Medicine, Rainbow Children's Hospital, Hyderabad. Track 3 - Clinical Biochemistry & Clinical Pathology
under the leadership Dr Shanthi Naidu (Course Coordinator)

Under the Academic Activities, webinar are held every month and speakers are invited from all over India. As part of this initiative, zonal workshops were held – North, East and West.





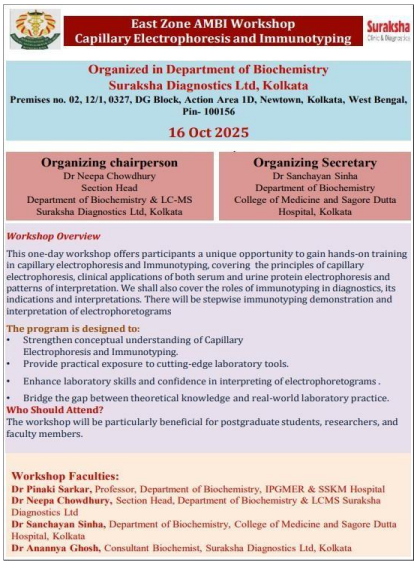





AMBI ACADEMICS
Association of Medical Biochemists of India
Potential of miRNAs in Breast Cancer:
Diagnostics to Therapeutics
Webinar 06/2025/030
Wednesday, 27th August, 2025
7:00 pm - 8:00 pm
Link for online meeting will be shared with registered members
Registration is complementary but compulsory
Dr. Shivani Jaswal
Prof. and Head Biochemistry
GMCH, Chandigarh


North Zone AMBI Workshop
Basic and Advanced Genomic Techniques
Organized by Department of Biochemistry
Government Medical College & Hospital, Chandigarh
18-19 Sept 2025
Coordinator
Dr. Shivani Jaswal
Professor & Head, Biochemistry
GMCH Chandigarh
Venue
Department of Biochemistry
Level IV, E Block,
GMCH, Chandigarh
About the workshop
This two-day workshop will provide participants with hands-on training in both basic and advanced genomic techniques, including DNA handling, PCR, and sequencing workflows. It is designed to strengthen conceptual understanding while offering practical exposure to cutting-edge tools used in molecular diagnostics. The program will benefit postgraduate students and faculty by enhancing laboratory skills, improving confidence in handling genomic techniques, and bridging the gap between theory and practice.
Who can participate?
Postgraduate students
Faculty members
Workshop Faculty
Dr Jasbinder Kaur, Professor Biochemistry, GMCH Chandigarh
Dr Shivani Jaswal, Professor Biochemistry GMCH Chandigarh
Dr Seema Gupta, Assoc Professor Biochemistry, GMCH Chandigarh
Dr Anil Kumar Pinnaka, Senior Principal Scientist IMTECH Chandigarh
Dr Vishal Sharma, Research Scientist MDRU, GMCH Chandigarh


East Zone AMBI Workshop
Capillary Electrophoresis and Immunotyping
Suraksha
Organized in Department of Biochemistry
Suraksha Diagnostics Ltd, Kolkata
Premises no. 02, 12/1, 0327, DG Block, Action Area 1D, Newtown, Kolkata, West Bengal, Pin- 100156
16 Oct 2025
Organizing chairperson
Dr Neepa Chowdhury
Section Head
Department of Biochemistry & LC-MS
Suraksha Diagnostics Ltd, Kolkata
Organizing Secretary
Dr Sanchayan Sinha
Department of Biochemistry
College of Medicine and Sagore Dutta Hospital, Kolkata
Workshop Overview
This one-day workshop offers participants a unique opportunity to gain hands-on training in capillary electrophoresis and Immunotyping, covering the principles of capillary electrophoresis, clinical applications of both serum and urine protein electrophoresis and patterns of interpretation. We shall also cover the roles of immunotyping in diagnostics, its indications and interpretations. There will be stepwise immunotyping demonstration and interpretation of electrophoretograms
The program is designed to:
• Strengthen conceptual understanding of Capillary Electrophoresis and Immunotyping.
• Provide practical exposure to cutting-edge laboratory tools.
• Enhance laboratory skills and confidence in interpreting of electrophoretograms .
• Bridge the gap between theoretical knowledge and real-world laboratory practice.
Who Should Attend?
The workshop will be particularly beneficial for postgraduate students, researchers, and faculty members.
Workshop Faculties:
Dr Pinaki Sarkar, Professor, Department of Biochemistry, IPGMER & SSKM Hospital
Dr Neepa Chowdhury, Section Head, Department of Biochemistry & LCMS Suraksha Diagnostics Ltd
Dr Sanchayan Sinha, Department of Biochemistry, College of Medicine and Sagore Dutta Hospital, Kolkata
Dr Anannya Ghosh, Consultant Biochemist, Suraksha Diagnostics Ltd, Kolkata


East Zone AMBI Workshop
Capillary Electrophoresis and Immunotyping
Suraksha
Organized in Department of Biochemistry
Suraksha Diagnostics Ltd, Kolkata
Premises no. 02, 12/1, 0327, DG Block, Action Area 1D, Newtown, Kolkata, West Bengal, Pin- 100156
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Dr Sanchayan Sinha, Department of Biochemistry, College of Medicine and Sagore Dutta Hospital, Kolkata
Dr Anannya Ghosh, Consultant Biochemist, Suraksha Diagnostics Ltd, Kolkata

National Society Report – MACB Malaysia

Name of Society	MALAYSIAN ASSOCIATION OF CLINICAL BIOCHEMISTS (MACB)
Email	MACB_secretary@yahoo.com
Name of President & National Representative	Raja Elina Raja Aziddin E-mail: rajaelina@gmail.com, president@macb.org.my
Secretary	Chuo Pek Ham E-mail: phchuo@yahoo.com, MACB_secretary@yahoo.com

Submitted by:
Raja Elina Raja Aziddin,
President MACB

A. EVENTS ORGANISED BY THE MACB IN 2025

1. MACB WEBINAR ON SIGMA METRICS

A webinar on the topic "Overview of Six Sigma Metrics for the Clinical Laboratory" was held on 21 March 2025@9 am Malaysia Time in collaboration with QuidelOrtho.

The webinar was delivered by Johanna J. Mille, a Global Product Manager at QuidelOrtho, specialising in laboratory assay quality and data-driven insights. Topics covered in the webinar included CLIA standards and changes made, background on Six Sigma and calculation of Six Sigma metrics, benefits of using Sigma metrics, how to respond to poor sigma metrics and general tips for quality performance.



Pic 1: Sigma Metrics Webinar Flyer

The webinar was attended by 718 participants with the following breakdown: Malaysia (439, 61%), Philippines (148, 21%), Vietnam (57, 8%), Indonesia (46, 6%) India (22, 3%), Singapore (2), Australia (1), Nepal (1) USA (1) and China (1).

2. INTERNATIONAL CONFERENCE OF BIOCHEMISTRY, MOLECULAR BIOLOGY AND LABORATORY MEDICINE 2025 (ICBMBLM 2025 & 35th MACB ANNUAL CONFERENCE

The Malaysian Association of Clinical biochemists (MACB) organised the International Conference of Biochemistry, Molecular Biology and Laboratory Medicine 2025 (ICBMBLM 2025) on 25-27 August, 2025 at M Hotel, Petaling Jaya, Malaysia in conjunction with the 35th MACB Annual Conference 2025 and 49th MSBMB Annual Conference 2025.

The APFCB conducted a Pre-Conference Workshop on Method Verification on 25th August 2025, followed by a Symposium titled Building a Greener Tomorrow: Sustainability Strategies for Clinical Laboratories on Day 1 of the conference. An APFCB Travel Grant was awarded to Dr. Rashmita Mallick from India to attend the conference. She presented a paper entitled "Paraoxonase 1 Activity, Its Polymorphism, and Their Correlation with Surgical Site Infection in Abdominal Surgeries".



Pic 2: 35th MACB Pre-Conference Workshop 2025 Flyer



Pic 3: 35th MACB Conference 2025 Flyer



Pic 4: MACB President with speakers of the APFCB Symposium – Dr Tony Badrick (APFCB President), Dr Prasenjit Mitra (India) and Dr Thyrza (Indonesia).

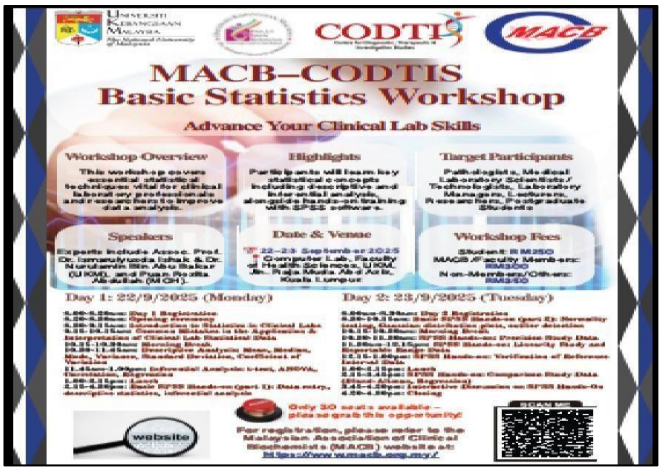


Pic 5: Prof Tomris Ozben, IFCC President with conference participants at the MACB Conference dinner.

The conference successfully showcased innovations and advances in laboratory sciences under the theme "Charting New Frontiers: Integrating Sustainable Innovations for Next-Generation Healthcare." It facilitated international collaborations with the IUBMB and APFCB, providing opportunities for knowledge exchange and networking among regional and global experts.

3. MACB-CODTIS BASIC STATISTICS WORKSHOP

The MACB-CODTIS Basic Statistics in Clinical Laboratory Workshop 2025 was successfully conducted on 22-23 September 2025 at the Computer Laboratory, Faculty of Health Sciences, Universiti Kebangsaan Malaysia (UKM). This event marked the first joint workshop organized by the Malaysian Association of Clinical Biochemists (MACB) and the Centre for Diagnostic, Therapeutic & Investigative Studies (CODTIS), Faculty of Health Sciences, Universiti Kebangsaan Malaysia (UKM).



Pic 6: Basic Statistics Workshop Flyer

The workshop aimed to strengthen the application of basic statistical techniques in clinical laboratories, with a particular focus on method verification data analysis. The program included interactive lectures and hands-on training using SPSS software with real laboratory data.

A total of 20 participants attended the workshop, representing a diverse group of laboratory managers, medical laboratory scientists (MLS), science officers from both government and private laboratories, and master's students in pathology.

4. PROFESSIONAL CERTIFICATE IN CHEMICAL PATHOLOGY LABORATORY DATA ANALYSIS COURSE - MACB COLLABORATION WITH UKM

The Professional Certificate in Chemical Pathology Data Analysis course was approved following a meeting on 7th March 2025 with UKM Shape To discuss the implementation, a meeting between MACB President and representatives from UKM was held on 8th August 2025 in MACB office. The Professional Course in Chemical Pathology Data Analysis was officially launched on 10th September 2025 in FSK UKM, KL.



Pic 7: Meeting of course lecturers to finalise lecture schedule

The 6-month course, which commenced on 10 November 2025, prepares students to understand pathophysiology and biochemical changes in relation to Chemical Pathology Laboratory data that are associated with pathological conditions. It enhances skills in interpreting Chemical Pathology Laboratory data, identifying abnormalities in organ function, recognising the need to perform specialised tests as well as emphasising laboratory management.



Pic 8: Professional Certificate Course flyer

MACB has offered 2 scholarships to its eligible members to attend the 2025 course.

5. ACCURACY-BASED ASSESSMENT PROGRAMME (EQAP)

A EQAP Stakeholder Engagement Session was held on 6th October 2025 at Novotel Kuala Lumpur City Centre. This focussed symposium was co-jointly organised by Health Science Authorities Singapore (HSA), National Metrology Institute of Malaysia (NMIM), MACB and Department of Standards Malaysia.





Pic 9: EQAP Stakeholder Engagement Session Programme

Topics covered included Overview of Clinical Lab Quality in Malaysia, Introduction to Malaysia's National Quality Infrastructure, Accuracy-Based External Quality Assessment Programme (EQAP) followed by a Stakeholder Interests & Needs Dialogue and Evaluation of Measurement Uncertainty Using EQAP Results. Lectures were delivered by representatives from MACB, DSM and HSA.

6. 35th MACB ANNUAL GENERAL MEETING AND PRE-AGM SCIENTIFIC SYMPOSIUM

The 35th Annual General Meeting (AGM) and Scientific Symposium was convened on 15th November 2025 (Saturday) at the Kuala Lumpur Bird Park in Taman Tasik Perdana. The Scientific Symposium, themed "*Quality, Sustainability, and the Future of Diagnostics*," featured insights from three invited speakers; Prof. Dr. Amir Hamzah Abdul Latiff from the Sunway Centre for Planetary Health, Dr. Nadiah Mohamed Zainuddin from the Department of Pathology at Hospital Kuala Lumpur, and Jamie Phares from Beckman Coulter DX. Their presentations covered critical topics including risk-based Quality Control (QC), the interface of sustainable diagnostics in planetary health, and environmental stewardship in clinical laboratories.



Pic 10: Scientific Symposium Flyer



Pic 11 : Q&A Session



Pic 12: Group photo with the speakers, MACB Council and members

Following the conclusion of the scientific session, the Annual General Meeting (AGM) took place, with members staying on at the venue and on the virtual platform to participate in the AGM. The hybrid format supported a total of 27 members attending physically and 21 participants joining via Microsoft Teams. The session was also joined by corporate members representing organisations such as Becton Dickinson (BD), DKSH and DW Labs

B. EVENTS UNDER MACB AUSPICES HELD IN 2025

1. MINDRAY NORTHERN REGION URINALYSIS WORKSHOP 2025

The Mindray Northern Region Urinalysis Workshop 2025 which was held on 5th May 2025 at Dewan Nilam, Hospital Kepala Batas was organized by AMD Solutions Sdn Bhd. under the MACB AUSPICES. The primary objective of the workshop was to introduce and demonstrate the Mindray Urine Total Solutions Product Portfolio. The workshop also showcased performance evaluations and clinical applications of Mindray's fully automated urine analyzers in renal disease and urinary tract infections (UTI), and discuss the Mindray Urinalysis Workflow to enhance interpretation of urine chemistry and sediment results. In addition, the event also presented the Mindray Dysmorphic RBC Analysis for determining sources of haematuria, educate participants on the Weqas EQA programme from Cardiff, UK, and facilitate discussions on current challenges in urinalysis testing in public hospitals.





Pic 13: The workshop commenced with opening speeches delivered by Dr. Raja Elina (President of MACB), Dr. Mohd Jamsani Mat Salleh, Head of Unit, Chemical Pathology Department, Hospital Seberang Jaya, and Mr. Andy Yee, Executive Director of AMD Solutions Sdn Bhd.



Pic 14: Participants of the Mindray Northern Region Urinalysis Workshop 2025

The event successfully provided comprehensive exposure to Mindray's urinalysis solutions, facilitated valuable knowledge exchange on clinical applications, and encouraged constructive discussions on improving urinalysis practices within healthcare institutions.

2. SIEMENS HEALTHINEERS LAB SOLUTION INNOVATION DAY 2025

The Siemens Healthineers Lab Solutions Innovation Day was a professional event held on 1st July 2025, at the M World Hotel, operating under the auspices of the Malaysian Association of Clinical Biochemists (MACB). The event was well-attended, bringing together approximately 150 participants to focus on innovation and sustainability in laboratory diagnostics. The agenda featured a diverse group of international and local experts. The educational objectives centred on building greener and more efficient laboratories.





Pic 15: Participants at the Siemens Healthineers Lab Solution Innovation Day 2025

This year's theme, *"Do Less"*, featured presentations and demonstrations on building greener and more efficient laboratories, showcasing the transformative potential of the FlexLab™ X automation platform, the latest assay innovations, and the integration of digital solutions to enhance lab performance.

The workshop effectively integrated scientific updates and technology demonstrations to drive the development of smarter and more connected laboratories.

3. ROCHE INNOVATION DAY 2025

The Roche Innovation Day 2025 was held on 18th June 2025 at the Renaissance Hotel Kuala Lumpur, under the auspices of the Malaysian Association of Clinical Biochemists (MACB). The event, organized by Roche Diagnostics (M) Sdn. Bhd., was attended by 190 healthcare professionals, including Heads of Department and Unit, and Lab Managers from Chemical Pathology and Histopathology Divisions. The primary objective was to serve as an avenue for networking and the exchange of knowledge among professionals in the diagnostics field.

The programme focused on the digital transformation of diagnostics and its impact on healthcare. The key topics included user experience sharing on Hepatocellular Carcinoma (HCC) patient management using specific biomarkers (PIVKA & GAAD), centralizing decentralized patient care via integrated Point-of-Care (POC) management solutions, and empowering pathology through digital pathology with algorithms.



Pic 16: Participants at the Roche Innovation Day KL 2025

The event successfully brought together experts and clinicians to highlight how digital tools are driving laboratory efficiency, enabling precision diagnostics, and empowering people with real-time data for better, more confident clinical decisions.

c. MACB GRANTS AND YOUNG SCIENTIST AWARDS

In 2025, the MACB conferred four (4) Young Scientist Awards and recognized one (1) MACB Grant recipient, who presented their research at the 35th MACB Conference. Additionally, MACB awarded two (2) Travel Grants to distinguished members: one (1) to present her paper at the XXVI IFCC-EFLM EuroMedLab Congress in Brussels, Belgium, and another to participate in the 17th Asian Forensic Science Network (AFSN) and the 13th Asia Pacific Medico-Legal Agencies (APMLA) Conference, held at the Inspire Entertainment Resort, Incheon, South Korea, from 15-19 September 2025.

d. MACB PARTICIPATION IN INTERNATIONAL EVENTS

1. IFCC GLOBAL MEDLAB WEEK 2025

The Malaysian Association of Clinical Biochemists (MACB) team participated in Global MedLab Week 2025, an IFCC initiative that celebrates the vital role of laboratory medicine and laboratory professionals in patient care and public health.

As part of the campaign, two submissions were prepared. First, a four-minute podcast titled "Lab Saves Life: Collaboration between Hospital Kuala Lumpur, Hospital Tunku Azizah, and MACB" moderated by Dr. Siti Nor Aishah Saharudin (Medical Lab Scientist from HTA Pathology Department) with panellists Dr. Chan Xin Yi (Toxicologist from HKL Emergency Department) and Miss Yew Jie Min (Pharmacist from HKL Pharmacy Department). The podcast engaged key clinical users of laboratory results, medical and pharmacy teams to demonstrate how timely, accurate laboratory data informs treatment decisions and helps save lives; this form of engagement was insightful and refreshing for all parties.

Second, a short video highlighted the importance of rapid notification of critical results to clinicians, reinforcing that fast action saves lives. This message aligns with widely recognized patient-safety guidance emphasizing timely communication of critical values.



The video can be viewed here:

Pic 17: MACB Podcast team

Overall, MACB's participation strengthened collaboration with clinical stakeholders and showcased the direct impact of laboratory services on patient outcomes within the Global MedLab Week campaign.

2. REGIONAL ASIA PACIFIC THERAPEUTIC DRUG MONITORING CONFERENCE 2025 (RAPTDM 2025)

The Regional Asia Pacific Therapeutic Drug Monitoring Conference 2025 (RAPTDM 2025) was held for the first time at the Eastin Hotel, Penang, from 7th to 8th April 2025.

This inaugural conference focused on Therapeutic Drug Monitoring (TDM) as a vital component of precision medicine and served as a platform for healthcare professionals to exchange knowledge, discuss best practices, and strengthen regional collaboration. Renowned speakers presented on TDM applications, particularly in antifungal and immunosuppressant monitoring, with emphasis on improving patient outcomes through multidisciplinary practice.

MACB received sponsorship from Analytical Scientific and the Royal College of Pathologists of Australasia (RCPA) and provided opportunity to 6 members (four Chemical Pathologists and two Scientific Officers) to attend the event.

A poster presentation titled "Evaluation of Accuracy and Performance of the RECIPE ClinMass Kit for an External Quality Assurance Programme with a Clinical Laboratory Automated Module (CLAM) Liquid Chromatography Tandem Mass Spectrometry System" was presented by Dr. Nor'ashikin Othman. The presentation highlighted local validation efforts and quality assurance initiatives supporting the implementation of LC-MS/MS-based TDM services in Malaysia.

3. IFCC GENERAL CONFERENCE 2025

The IFCC General Conference 2025, themed *"Connecting Science, Health, and Innovation: The Future Flows Like Water"*, took place from May 16-17, 2025, at the Hotel Crown Plaza in Bruges, Belgium. Held every three years, this flagship event continues to serve as a vital platform for IFCC member organizations, promoting scientific dialogue, policy harmonization, and

professional networking. The Malaysian Association of Clinical Biochemists (MACB) was represented by its President, Dr. Raja Elina Raja Aziddin, and Treasurer, Madam Chen Bee Chin.

Day 1 opened with an address by IFCC President Prof. Tomris Ozben, followed by updates from the IFCC Executive Board, Regional Federations, Divisions, and Task Forces, highlighting current activities, strategic plans, and future directions. Discussions also focused on the future of the in vitro diagnostic (IVD) industry, with emphasis on partnership models to support the integration of emerging technologies in medical laboratories. The day concluded with a General Conference Networking Gala Dinner.



Pic 18: Networking at IFCC General Conference Gala Dinner

Day 2 focused on laboratory errors and approaches to improve diagnostic accuracy and patient safety, sustainability and innovative payment models, and strategic planning to inform IFCC's future roadmap. Networking opportunities were also highlighted through the IFCC platform. The conference concluded with closing remarks, *"Science: Now More Than Ever,"* delivered by Prof. Tomris Ozben, who summarized key outcomes, acknowledged participants' contributions, and outlined future IFCC initiatives.

The IFCC General Conference 2025 reinforced its role as a pivotal forum for advancing laboratory medicine globally. The MACB's participation contributed to ongoing regional and international collaboration, aligning Malaysia's laboratory standards with global best practices. During the meeting, the MACB President and Dr Leslie Lai, Chair of the 18th APFCB Congress also took the opportunity to network with potential speakers for the 18th APFCB Congress which will be held in Kuala Lumpur in 2027.

4. 26TH IFCC-EFLM EUROMEDLAB CONGRESS 2025

Following the IFCC General conference, delegates convened in Brussels for the 26th IFCC-EFLM EuroMedLab Congress, held from 18th to 22nd May 2025. The congress showcased cutting-edge advancements in laboratory automation, digital health, and mass spectrometry. Sustainability and AI integration were central themes. Exhibitors showcased advanced technologies such as automated mass spectrometry, robotics, and customizable workflow solutions aimed at improving efficiency, reducing costs, and enhancing diagnostic accuracy.



Pic 19: MACB President, MACB Treasurer with Malaysian delegates at the 26th IFCC-EFLM EuroMedLab Congress



Pic 20: MACB President at the Beckman Exhibition Booth, 26th IFCC-EFLM EuroMedLab Congress

The MACB President and treasurer took the opportunity to network with participants, exhibitors and speakers to lobby for the 18th APFCB Congress 2027. The IFCC General office staff and EuroMedLab 2027 organisers helped in disseminating the 18th APFCB Congress 2027 flyers to congress participants at their respective booths.

5. 23rd CONGRESS OF THE INTERNATIONAL ASSOCIATION OF THERAPEUTIC DRUG MONITORING AND CLINICAL TOXICOLOGY (IATDMCT 2025)

The 23rd International Congress of Therapeutic Drug Monitoring and Clinical Toxicology (IATDMCT 2025) was held from 21st to 24th September 2025 at the Grand Copthorne Waterfront Hotel, Singapore.

MACB received sponsorship from Shimadzu Malaysia Sdn Bhd. for this event and gave opportunity to a Chemical Pathologist and a Senior Scientific Officer to attend the Congress. MACB member Mdm Chuo Peck Ham presented a poster titled "Preliminary Study: Correlation of Fully Automated LC-MS/MS in Tacrolimus and Everolimus Quantification".

In conjunction with the congress, they also attended a practical session titled "From Sample Analysis to Treatment Decision," organized by Hitachi Hi-Tech at the Academy, Singapore General Hospital.

This participation provided an opportunity to share local research, gain hands-on experience with LC-MS/MS, and engage with international experts in TDM and clinical toxicology. The congress, themed *"Creative Solutions for Global Challenges,"* coincided with the implementation of new TDM testing for antifungal and immunosuppressant drugs at HKL, strengthening collaboration, technical expertise, and the advancement of TDM services in Malaysia.

6. MINDRAY INTERNATIONAL CLIC-TALK (CHEMILUMINESCENCE IMMUNOASSAY AND CHEMISTRY TALK)

With the support from Chemopharm Sdn Bhd, a Scientific Officer was nominated to attend the Mindray International CLIC-Talk, held from 28th to 31st October 2025 in Shenzhen, China.

The program offered an opportunity for knowledge exchange with leading experts from the International Federation of Clinical Chemistry and Laboratory Medicine (IFCC) and other prestigious institutions, providing insights that could support the enhancement of diagnostic practices in Malaysia.

7. 19TH NATIONAL CONGRESS OF LABORATORY MEDICINE (NCLM)

An Asia-Pacific International Expert Symposium was convened on Day 1 of the 18th National Congress of Laboratory Medicine, held in Jinan, Shandong, China, from 30 October to 1 November 2025. The symposium featured distinguished speakers, including representatives from national societies of the Asia-Pacific Federation of Clinical Biochemistry and Laboratory Medicine (APFCB).

The President of the Malaysian Association of Clinical Biochemists (MACB) delivered a lecture entitled "Behind the Scene: Understanding the Challenges of Drugs of Abuse Result Interpretation." She also took the opportunity to highlight the coming 18th APFCB Congress 2027 in Kuala Lumpur.



Pic 21: MACB president at the 19th NCLM 2025 in Jinan, China

The Congress attracted an impressive attendance of nearly 10,000 local delegates. The Chinese Society of Laboratory Medicine, as the organiser of the Congress, extended exceptional hospitality to the APFCB delegation.

E. MEMBERSHIP TO THE EFLM ACADEMY

Since 2021, the MACB has handled the blocked enrolment for its members to the EFLM Academy. This benefit has been extremely popular, with eEFLM Academy membership growing significantly from 47 MACB members enrolled in 2021 to 117 members in 2025.

National Society Report – ACBI India

NAME OF SOCIETY	ASSOCIATION OF CLINICAL BIOCHEMISTS India (ACBI)
OFFICE SOCIETY EMAIL ADDRESS	kpsacbi@yahoo.co.in
NAME OF PRESIDENT & NATIONAL REPRESENTATIVE	President: Prof. Indu Verma E-mail: kpsacbi@yahoo.co.in
NAME OF NATIONAL REPRESENTATIVE TO APFCB & EMAIL ADDRESS	Secretary: Prof. Rajiv Ranjan Sinha E-mail: kpsacbi@yahoo.co.in

Report submitted by:
Prof. Rajiv Ranjan Sinha

CONFERENCE REPORT

The Association of Clinical Biochemists of India (ACBI) were the proud host of the **34th. conference of World Association for Pathology and Laboratory Medicine (WASPaLM) and the 51st. Annual National conference of ACBI** held at Hotel Westin, Koregaon Park, Pune from 14th to 17th October 2025. It was the first time that a WASPaLM congress was being held in India. The theme of this congress was "**Laboratory Medicine at the Frontier of Patient-Centric Care**". More than 700 biochemists and medical laboratory professionals from across the country and globe shared their expertise and contribution in the field of Clinical biochemistry and laboratory Medicine. The extensive scientific program of the conference was graced by the presence of esteemed national and international dignitaries from sixteen different countries such as Uruguay, USA, Canada, Netherlands, Germany, Hungary, Turkey, Italy, France, Belgium, Australia, Malayasia, South Africa, Japan, South Korea and Malaysia.



Photo 1

The program included Plenary Lectures, symposia, panel discussions and preconference workshops that provided an enriching platform for experts, to exchange knowledge and discuss the latest advancements in the field.

The main conference had four parallel sessions and each one of them witnessed good attendance and active participation from the delegates. Prof Bernard Gouget (France) participated as Visiting Lecturers under the IFCC-Abbott Visiting Lecturer Program (IFCC-VLP). Prof. Gouget addressed the identification, assessment, and translation of emerging diagnostic technologies and data analysis procedures – from academic laboratories to clinical settings. Their contributions provided valuable insights emphasizing the importance of bridging the gap between research and its successful implementation in healthcare.

Pre-Conference Workshops:

Before diving into the scientific content of the conference, four pre-conference workshops were organized on 14th October 2025, all of which were at full capacity. All the workshops were conducted simultaneously AFMC, Pune, Dinanath Mangeshkar Hospital & KEM Hospital. The first workshop entitled **Therapeutic drug monitoring using LCMS/MS** was conducted in Pathology Department, Deenanath Mangeshkar Hospital & Research Center, Pune. The workshop was conducted by the team of Drs. Sadanand Naik, Namita Mahalle, Sharwari Narawade & Ramiz Azad. The second workshop was **Next Generation Sequencing & Its Applications Venue** conducted at the Department of Biochemistry at AFMC, Pune. Faculty was Drs. Bhaskar Mukherjee, Anurodh Gupta, Subhashree Pradhan, Deeptika Agrawal, Dwipa Parmar, Shreya Solanki, Barun Kumar Chakraborty and Rajan Nagendra. The third workshop was on Flow cytometry conducted at the KEM Hospital, Pune and was helmed by Ketaki Kelkar, Kiruthiga Ganeshan, Mayuri Sesmy and Ravi Godbole. The fourth workshop was **Protocol Development of Systematic reviews and meta-analysis for Diagnostic Test Accuracy (DTA) Studies**. It was held at AFMC, Pune with the following Faculty: Praveen Sharma, Dharamveer Yadav Amit Pal & Jaykaran.



Photo 2

The 34th. WASPaLM and 51st. ACBICON 2025 was meticulously organized, featuring forty-six symposia's, two plenary lectures and twelve industrial lectures spread over three days, divided into four parallel segments across distinct halls, each dedicated to specific themes. Renowned personalities from the field of clinical biochemistry and laboratory medicine chaired the sessions, enriching the discussions with their expertise. The first day started with two Young Faculty symposia and also two symposia by young delegates. Dr. Kannan Vaidyanathan and Dr. Rachita Nanda chaired the first session where seven young faculties gave their talk. In another parallel session which was chaired by Dr Dharamveer Yadav and Dr. Manjulata Kumawat, seven young faculties gave their presentation. In the parallel sessions, 3 & 4, Dr. Shailja Sharma, Mingma Sherpa, Dr. Deepak Parchwani and Dr. Sandhya Pillai-Nair chaired sessions in which 16 young delegates gave their talk.

This was followed by the official opening of the congress industrial exhibition by Dr Roberto Verna, President-Elect, WASPaLM. Roberto went around and interacted with all representatives of IVD industries who were manning their stalls.



Photo 3



Photo 4

This was followed by 4 parallel symposia. The first was the symposia organized by the World Pathology Foundation. Speakers were Dr. Roberto Verna who talked about Laboratory in Clinical Research, Dr. Lai Meng Looi on Recent reforms in pathologist training in Malaysia and Drs. Ana Aceves Capri: (VIRTUAL). The 2nd Symposia was titled "**Artificial Intelligence (AI) - Driven Innovations in Clinical Diagnostics and Healthcare"** which was chaired by Dr. Bernard Gouget. The speakers were Amit Kharat, Bernard Gouget and Ashishkumar Agravatt.

ICMR Reference Interval Panel Discussion. Moderator: Praveen Sharma: Panellist were Praveen Sharma, Barnali Das, Sudip Kr. Dutta, Dharamveer Yadav and Nilesh Chandra.

Another session under the WASPaLM banner was the first of the three sessions of the **4th International Meeting of Residents in Pathology and Laboratory Medicine** in which the following topics & presenter were: Harmonization of Clinical Pathology/Laboratory Medicine Curricula in Different Countries.

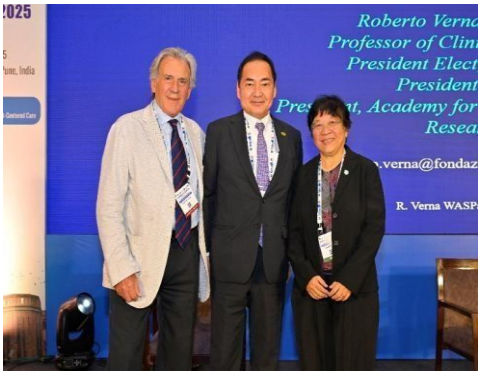


Photo 5



Photo 6

In the post lunch session, we had four parallel symposia. First, we had the **WASPaLM-IFCC session** in which the speakers were Sergio Bernardini, Sedef Yenice and Prasenjit Mitra. The second parallel session was the **TSC (Turkish Society)** – Virtual session on **Integrating High-Sensitive Cardiac Biomarkers and Artificial Intelligence in Emergency Cardiac Diagnostics** in which the speakers were M. Erinc Sitar, Banu Isbilen Basok. The third symposia was the **IFCC-ETD Symposia on Advanced Diagnostics for Precision Health: From Omics to On-the-Go Testing**. The speakers were Swarup A. V. Shah, Sridhar Sivasubbu and Bernard Gouget Chair: From Omics to On-the-Go Testing. The final parallel session was on **Complement pathways** in which the speakers were Marie Durey, Valentine Lobo, Ruma Manchanda and Kiran Sathe.



Photo 7

Following this was Symposia 13, 14, 15 and 16. Symposia 13 was organized by the **Brazilian Pathologists Association** on **Infectious Diseases in Brazil in XXIst Century; from conventional to metagenomics.** The speakers were Alvaro Pulchinelli, Luciana Franco and André M. Doi. Symposia 14 was organized by the SAACBLM **(SOUTH AFRICA)** with the symposia topic– **"Clinical laboratory cardiovascular risk assessment in 2025: Where are we now?".** The speakers of this session were Dr. Tahir Pillay, Dr. Rivak Punchoo and Barbara Van Deventer: MicroRNAs and cardiovascular disease. (VIRTUAL).

Infection and Immunity was the topic of symposia 15. The speakers were Anmol Chandele, Nimesh Gupta, Archana Singh and Kalpana Luthra. The last symposia in this session was on **Cancer Biology** and was helmed by Ashok Sharma, Subrata Sinha, Shyam S. Chauhan and Mayank Singh.

The final session of the day had symposia 17 by **FEDERACIÓN MEXICANA DE PATOLOGÍA CLÍNICA (MEXICO)** on the topic **Laboratory medicine in the era of precision medicine** and the speakers were Guillermo Santoscoy-Ascencio, Fernando Santoscoy-Hernández and Deepak Parchwani. 18 was by conducted virtually by the **Chinese Society for Laboratory Medicine.** The topic of the symposia was **The Value and Role of Laboratory Medicine in the Diagnosis and Treatment of Major Chronic Diseases.** The speakers were Chuanxin Wang, Ming Guan and Li Jiang. Another symposium (19) was **Nutritional Epigenetics** by Jyotdeep Kaur, Sadhana R Joshi, and Subash Chandra Gupta. This was followed up by a visit to congress exhibition and poster. This was followed up by 2 industrial lectures – Serum Institute of Indi and Horiba India ltd.

The opening ceremony was grand affair with a Plenary lecture given by Dr Rahul Purwar who spoke on First "Make in India" CAR-T cell therapy: from RnD to clinic to Market. This was followed by a grand welcome dinner.



Photo 8

Day 2 (15th October 2025) started with 4 symposia in parallel. The first was "**AI in Laboratory Medicine: Past, Present, and Future**" in which the speakers were. Jay Kalra, Sudip Kumar Datta and Asmita Hazra. In tandem, "**chronic kidney disease (CKD): Unravelling Mechanisms, Advancing Markers, and Improving Outcomes"** where Medha Rajappa, Sabarinath Shanmugam and Kitlangki Suchiang were the speakers. We also had **CAHO Diagnostics Division Quality Management session** where Thuppil Venkatesh, Neeraj Jain gave their presentation. There was also a panel discussion where the Moderator was Dr. Aparna Jairam. The final in this session was a thought-provoking talk on **Neuroscience / Neurobiology** in which Aparna Dixit, Jyotirmoy Banerjee, Sudip Sen and Amisha Malhotra gave their input.

Post the morning session, we had 3 symposia sessions and one industrial lecture. **Advances in therapeutic drug monitoring** was helmed by Tester F. Ashavaid, Sharwari Narawade and Smita Pattanaik.



Photo 9

The second was **on Enhancing Antenatal care by Prenatal Maternal Screening**. The speakers were Shailja Sharma, Mithu Banerjee and Meenakshi Gothwal. Also, we had the **2nd Session of the WASPaLM: 4th International Meeting of Residents in Pathology and Laboratory Medicine** in which young delegates from WASPaLM member countries talked on Harmonization of Clinical Pathology/Laboratory Medicine Curricula in Different Countries. It was coordinated by Tahir Pillay (South Africa) and Ozkan Alatas (Turkey). Residents Panel was represented by Emir Matpan (Türkiye), Juhan Jordaan (South Africa), Ajay Divvela (India) and Omar Corzo Mendo (Mexico). Then we had an Industrial lecture sponsored by ABBOTT on the topic Integrated Liver Insights: From Lab to Clinic. Post this we had Industrial lectures which were given by Diasys, Beckman, Roche, – Werfen and Seimens. Before lunch we had the **2nd Plenary talk of the congress which was delivered by Prof. Yogesh Chawala who talked on "Liver biochemistry has changed hepatology clinical practice".**



Photo 10

The post lunch session saw the following talks: The **Frontier of Infectious Disease Testing by JSLM (JAPAN)** in which the speakers were Yuki Uehara, Naoki Uno and Yoshifumi Uwamino. **- KSLM (KOREA) presented talk on Present and future of Korean Laboratory Medicine.**

The speakers were Jeong-Yeol Ahn, Hyukmin Lee and Kyoung Un Park**. Biochemical and Genetic Interplay in Metabolic Syndrome** was presented by Eli Mohapatra, Rachita Nanda, Suprava Patel and Seema Shah. **Effective Leadership in the clinical laboratories** was presented by Sucheta Dandekar, Farzana Mahdi and Rohini Bhadre. **WASPaLM - ACCLMP (INDIA**) presented **Diagnostics as the steering force of tailormade therapeutics** in which the speakers were Sharmistha Choudhuri, Dibyaratna Patgiri and Rajarshi Sarkar. **Diseases Caused by Microplastics and Hormone Disruptors** was the topic by **FEDERACIÓN MEXICANA DE PATOLOGÍA CLÍNICA (MEXICO**). The speakers were Ana Isabel Hernández Blas, Alberto Zamora Palma and Fátima Martha Castillo Albarrán. **NABL accreditation and Clinical Laboratory Quality Management**. This topic was by Pradeep K. Dabla, Pankaj Johri and Rajni Dawar. The last session was the **IFCC C-CLM Symposia: Excellence in POCT: Achieving Quality beyond the Laboratory** in which the speakers were Praveen Sharma, Sohini Sengupta, Prasenjit Mitra and Saumya Srivastava. These were followed by the WASPaLM Board meeting the ACBI General Body Meeting. We had the **AFMC Post-Graduate Quiz** which had a real nail biting finish. The grand finale was the Banquet dinner in which the Armed Forces Medical College Jazz band mesmerized the audience with lively tunes. And not be outdone we had delegates joining them. The star of the event was Prof. Roberto Verna who sang a beautiful Italian song.

Day 3 (16th. October 2026) started early at 8 am with young delegates competing for the various ACBI Oral Awards. Post this, we had the 3rd. and final PLENARY lecture which was delivered by Dr. Rajiv Sarin on **Germline Genetic Testing for Cancer - Challenges & Opportunities in India.** It was very well received by all the delegates present. Delegates from Uruguay (symposia 41) gave their talk **on Diagnostic Tools in Autoimmune Diseases: From Conventional Practice to New Technologies**. Speakers were Celia Buzzi, Mercedes Menéndez and Raquel Ballesté. Along with this we had the Faculty Symposia in which Drs. Shyam Prakash, Manaswini Mangaraj, Amit Pal and Tushar Shegal spoke. **Omics in Biomarker Discovery: Bridging Laboratory Research and Clinical Application** (symposia 43) was delivered by Dr. Anant Mohan, Shilpy Sharma, Bela Goyal and Indu Verma. Alongside this we had the final session of the **WASPaLM: 4th International Meeting of Residents in Pathology and Laboratory Medicine.** The following Residents participated in this talk: Nyam Bizya (Mongolia), Shruti Singh (India), Anayeli Lio Ramírez (Mexico), Hyejung Lee (South Korea) and Chuanxin Wang. This was followed by symposia 45, 46, 47 & 48 in which speakers elaborated on important topics.

Post lunch session we had 3 sessions of Faculty symposia and 1 session for the young delegates. With this the curtain came down for the highly successful 34th WASPaLM & 51st. ACBICON 2025. We had the closing ceremony in which Dr Rajiv R Sinha, Chai, Org. committee, Dr Indu Verma, President ACBI, Dr Walter Allalon Prseident WASPaLM and Dr Robero Verna President-Elect WASPaLM expressed the thanks and gratitude to all present for participating and making this a success. Walter and Roberto congratulated the organizers for their meticulous planning and execution of the congress. They invited all to attend the next years congress in Malaysia. And finally, it came to an end with the signing of the National Anthem.

YOUNG SCIENTIST INTERVIEW



Dr Sibtain Ahmed

Affiliation: Assistant Professor Chemical Pathology & Vice Chair Clinical Services Aga Khan University Karachi, Pakistan

Address: Karachi, Pakistan

Professional society's affiliation: Pakistan Society of Chemical Pathology (PSCP)

Please introduce yourself?

I am Dr. Sibtain Ahmed, a chemical pathologist, academic, and laboratory medicine professional based at the Aga Khan University, Pakistan, where I serve as Assistant Professor, Director of the Chemical Pathology Residency Program, and Vice Chair of Clinical Services Pathology and Laboratory Medicine. My work sits at the intersection of diagnostics, education, and health systems strengthening. Over the past decade, I have focused on building high-quality, patient-centered laboratory services, while also advancing research in biochemical genetics, point-of-care testing, and data-driven laboratory medicine.

I often reflect that I did not simply choose chemical pathology; rather, chemical pathology chose me. This perspective has shaped a deep sense of commitment to the field, driving me to continuously align science, service, and education in meaningful ways. I have authored more than 100 peer-reviewed publications and actively collaborate with national and international partners through organizations such as the IFCC and APFCB. My work aims to translate scientific discovery into practical diagnostic solutions that improve outcomes for patients, particularly in resource-limited health systems across the Asia-Pacific region.

What is your main focus?

My primary focus is to strengthen laboratory medicine as a clinical decision-making tool rather than a passive testing service. I work on integrating advanced diagnostics, quality systems, and digital solutions into routine patient care, particularly in biochemical genetics, laboratory management, and point-of-care testing.

Chemical pathology is an inherently diverse specialty, and my work reflects this breadth. Rather than a single narrow focus, my efforts adapt to evolving clinical needs, health system priorities, and emerging technologies. This diversification is intentional and well aligned, enabling me to address interconnected challenges across diagnostics, quality, education, and service delivery while maintaining a clear commitment to patient-centered care.

A major pillar of my work is quality and patient safety. As a Certified Professional in Healthcare Quality (CPHQ), I lead quality improvement, accreditation readiness, and compliance with international standards across multiple laboratories. I am actively involved in internal audits, risk management, method validation, and continuous quality control to ensure that every reported result is accurate, traceable, and clinically reliable.

I also use big data and laboratory informatics to establish population-specific reference intervals, validate diagnostic equations, and improve result interpretation. In settings like Pakistan, where diagnostic cut-offs are often extrapolated from Western populations, my work aims to reduce misclassification and improve clinical relevance while training the next generation of laboratory professionals through structured, quality-focused education.

What else is important to you?

Beyond research and publications, what matters most to me is ensuring that high-quality diagnostics reach the people who need them most. Through my work in expanding point-of-care testing (POCT) across tertiary and secondary hospitals, I have seen how timely, decentralized testing can transform clinical decision-making.

Equally important to me is preparing the next generation of laboratory leaders. I have invested heavily in developing structured curricula in POCT, quality management, instrumentation, and leadership so that young professionals are not only technically competent but also system thinkers and change agents.

I believe that sustainable progress in laboratory medicine depends on combining access, quality, and leadership; so every patient, regardless of location, benefits from safe, reliable, and clinically meaningful testing.

What are your interests in biomedical lab medicine?

My interests in biomedical laboratory medicine center on using big data, artificial intelligence, and standardized reporting to make diagnostics more accurate, equitable, and clinically impactful. I work extensively with large laboratory datasets to develop population-specific reference intervals, validate diagnostic equations, and improve test interpretation for diverse populations. I am particularly interested in how AI-assisted analytics can support decision-making, reduce diagnostic errors, and enhance efficiency in high-volume laboratories.

Another major focus of my work is standardization, including the development of national guidelines for serum protein electrophoresis reporting, ensuring that complex results are communicated clearly and consistently to clinicians. Through point-of-care testing (POCT) initiatives, I also aim to bring high-quality diagnostics closer to patients, using Pakistan as a scalable model for accessible, decentralized laboratory medicine.

What are your future goals?

My long-term goal is to help build a resilient, data-driven, and patient-centered laboratory ecosystem across the Asia-Pacific region. I aim to expand point-of-care testing services so that high-quality diagnostics are not limited to tertiary centres.

Academically, I hope to continue developing multicentre research networks that generate region-specific evidence and shape global laboratory practice.

I also want to nurture young scientists through structured mentorship, leadership training, and international collaboration. Ultimately, I envision laboratory medicine in our region as a leader in innovation, quality, and equity; where scientific excellence directly translates into better health for our communities.

Interviewer



Dr. Vivek Pant

Consultant Biochemist and Head of Research Unit, Samyak Diagnostic Laboratory, Kathmandu, Nepal.

Member- Task Force on Global Lab Quality, IFCC

Corresponding member- Communication and Publication division, APFCB

Quidel™ Triage™ PlGF Biomarker Point of Care Test can aid in the early diagnosis of pre-eclampsia – saving two lives with one test

Corresponding Author:

Ms.Vonda McAllister

Affiliations & Association: Director. Global Product Management, Point of Care for Quidel Ortho

Conflict of interest: none

Email: ban.ang@quidelortho.com

Pre-eclampsia is a life-threatening condition affecting 5-15% of pregnancies in India. Alarmingly, the rate of preeclampsia has increased by 25 percent worldwide over the last two decades and is now a leading cause of maternal and infant illness and death.[1]

Early diagnosis is essential for intervention, as pre-eclampsia often progresses rapidly and unpredictably. Frequent and costly clinical assessments are usually required to differentiate those women who will deliver preterm from the majority of women who will deliver at term. However, traditional diagnostic methods and clinical observation can present challenges to accurately determine patient status.Current methods include measurement of maternal blood pressure, identifying the presence of protein in the urine and laboratory blood testing to detect maternal organ damage. These are poor determinants of a woman's level of risk for spontaneous or iatrogenic delivery. Limitations with today's tests also make it difficult to discriminate women with severe disease from those with mild or no disease, leading to over-management, increased risk to mother and baby, and unnecessary costs.2

AACB continues its collaboration with RCPAQAP, with a number of events over the last 6 months, including the **Industry Education Course** held in September, which equips application specialists, product support staff, and sales and marketing professionals with a comprehensive understanding of laboratory practices and standards. Additional joint activities feature guest speakers at branch meetings and the ever popular **Quality Control Satellite Meeting** at the AACB Annual Scientific Conference in New Zealand.

What does the Quidel Triage PlGF Test measure?

PlGF is expressed in the placenta and is essential for placental angiogenesis and maintenance of the maternal endothelium.3,4In a healthy pregnancy, PlGF concentration increases until week 30 gestational age, reflecting placental angiogenesis and a healthy endothelium (see High PlGF bioavailability).5 This makes (PlGF) a highly specific marker of failed placentation and its complications, including pre-eclampsia. In women with hypertension, PlGF is predictive of the development of preterm pre-eclampsia, with the lowest levels found in women who progress to an adverse pregnancy outcome.

Prospective longitudinal studies have demonstrated that women who develop pre-eclampsia have decreased circulating levels of bioavailable PlGF several weeks before the onset of clinical signs when compared with pregnant women with a normal outcome.6The Quidel Triage PlGF test is used in conjunction with other clinical information as an aid in the diagnosis of preterm pre-eclampsia and as an aid in the prognosis of delivery for women presenting with signs and symptoms of pre-eclampsia after 20 weeks and prior to 35 weeks of gestation.

How does the PlGF test support clinical decision-making?

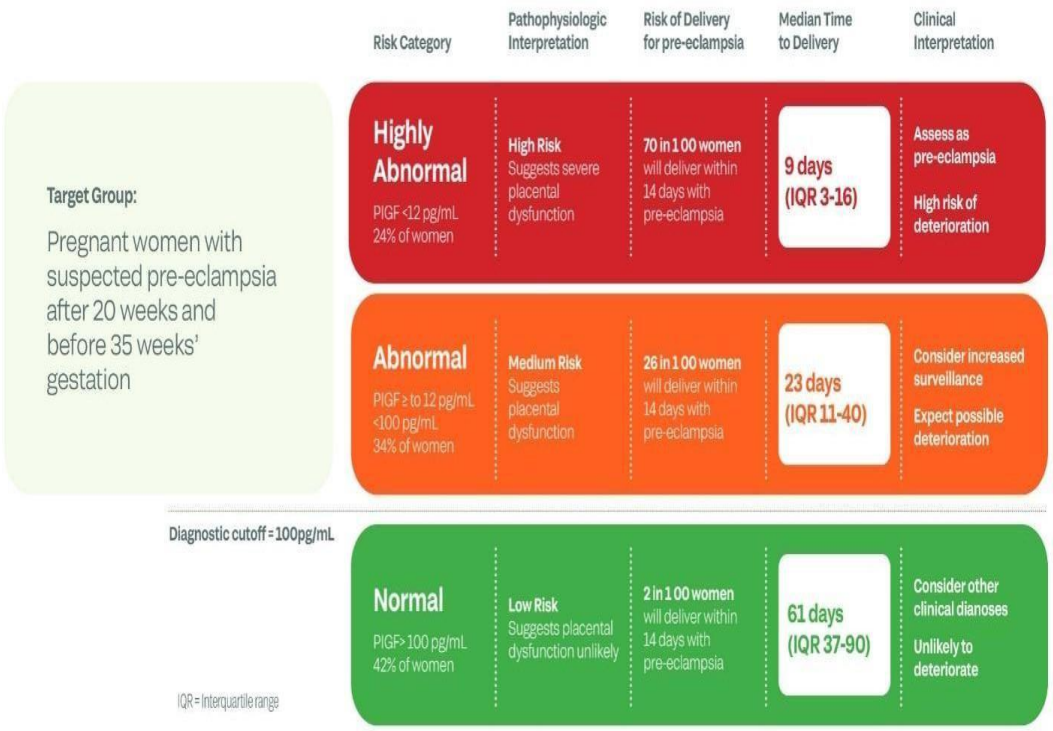
PlGF testing helps identify the presence of pre-eclampsia and the risk for pregnancy complications. Measuring PlGF concentration on the Quidel Triage PlGF test is helpful in anticipating and supporting a clinical diagnosis, assessing disease severity and the risk for short-term delivery, and predicting adverse outcomes.7-10Quantifiable PlGF test results fall within one of three discrete risk categories:

PlGF <12 pg/mL - Highly abnormal and suggestive of patients with severe placental dysfunction and at increased risk for preterm delivery with pre-eclampsia

PlGF ≥ 12 pg/mL and < 100 pg/mL – Abnormal and suggestive of patients with placental dysfunction and at increased risk for preterm delivery with pre-eclampsia

PlGF ≥ 100 pg/mL - Normal and suggestive of patients without placental dysfunction and unlikely to progress to delivery with pre-eclampsia within 14 days of the test

Early and accurate diagnosis of preeclampsia can save lives. The Quidel Triage PlGF test offers a rapid, evidence-based solution that helps manage high-risk pregnancies, where traditional assessments may be ambiguous or delayed. With accurate prognostic performance for preterm delivery within 14 days of PlGF evaluation, the PLGF test can help clinicians prioritize care with rapid risk stratification.[11]



Managing preeclampsia effectively requires tools that combine clinical reliability with practical application. PlGF-guided management using the Quidel Triage PlGF test can accelerate the diagnostic process and support targeted intervention for high-risk patients while avoiding unnecessary treatments and costs for those at low risk.[11]

What guidance has been established for PlGF-based testing?

The UK National Institute for Health and Care Excellence (NICE) first developed a national guidance for NHS England on PlGF-based testing in May 2016 to help clinicians diagnose pre-eclampsia in women suspected of having the condition (last updated July 2022). NICE recommends the use of PLGF-based tests, including Triage PlGF, to help diagnose or rule-out pre-eclampsia in pregnant women who are between 20 weeks and 36 weeks plus 6 days gestation and have signs or symptoms of pre-eclampsia.[12]

NICE guidance also notes that PlGF-based testing may particularly benefit groups at higher risk of severe adverse pregnancy outcomes, such as people from African, Caribbean and Asian family backgrounds. Evidence among the U.S. population shows preeclampsia occurring at a rate 60 percent higher in Black women than in White women. Black women are also more likely to experience poor outcomes and more severe complications associated with the condition, such as kidney damage and death.[13]

How is the PlGF test administered at the point of care?



The PlGF test uses EDTA anticoagulated plasma specimens run on the point of care QuidelOrtho Triage MeterPro® System. In addition to the PlGF test, the compact and powerful benchtopTriage System offers a diverse immunoassay menu with reliable diagnostic answers for quantitative troponin I, CK-MB, myoglobin, BNP, NT-proBNP, D-dimer and qualitative TOX drug screen.

Patient sample testing is a simple three-step procedure providing results in 15 minutes. User-friendly test cartridges are easy to manage. When used in conjunction with regular patient diagnostic and monitoring protocols, the PlGF test can provide 64% faster diagnosis of pre-eclampsia, 20% reduction in maternal adverse events and 35% fewer outpatient visits for improving resource efficiency without compromising care standards.[10]

Currently available outside the U.S in Europe, Canada, Africa and throughout the Asia-Pacific region, the Quidel Ortho PlGF test simplifies complex clinical scenarios, helping clinicians make timely and cost-effective decisions for both mothers and babies.

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In Asia, divergent patient care journeys make dengue diagnosis a challenge



Mr. Marvin Chan

Corresponding Author

Product Manager (Core Lab), Roche Diagnostics Asia Pacific

Email: marvin.chan@roche.com

Conflict of interest: none

Across the Asia Pacific region, the patient care journey for a dengue infection varies significantly depending on the structure of the local healthcare system.1 The primary divide stems from whether care is delivered via a centralised model or a community-based model.[1]

Delivering appropriate care for patients infected with the dengue virus is increasingly important as the pathogen becomes endemic in more places; nearly all countries in the Southeast Asia region are endemic. 2,3 With nearly 15 million cases of this virus reported by the World Health Organisation (WHO) last year – and hundreds of millions more cases suspected – the dengue virus is pervasive and dangerous. [2]

According to the WHO, 1.3 billion people in South East Asia live in areas where dengue is endemic.3 About half of the entire global burden of dengue infections falls on this population. Between 2015 and 2019, the number of dengue cases in this region rose by 46%.[3]

With so many people affected, inequalities in care delivery can have major consequences in public health. At the 2025 Advancing Diagnostics Roundtable convened by Vista Health at the sidelines of the Asia Dengue Summit, experts reported on pronounced differences in care pathways across the APAC region.

Where care is delivered

Optimal patient outcomes depend on two key factors: rapid diagnosis and early intervention2. Importantly, reliable diagnostic results can also inform public health efforts to control local mosquito populations, a key element in reducing outbreaks[2].

Across Asia, care pathways vary based on local healthcare models1. Many countries use a community-based approach to deliver diagnostic and patient care through local clinics, including [1]:

- Indonesia (puskesmas)
- Malaysia (klinikkesihatan)

Singapore (general practitioner clinics)In countries such as India and Thailand, care is more centralized, with limited access at the community level 1. Of course, access also depends heavily on the cost of tests. India, Malaysia, and Thailand offer free or fully subsidized diagnostic services for dengue infections, while Indonesia, Singapore, the Philippines, and Vietnam provide partially subsidized diagnostic services 1. In the Philippines, for instance, most diagnostics are out-of-pocket and not fully covered by insurance or PhilHealth – a government insurance corporation aiming to provide universal health coverage for the nation [1].

A challenging diagnostic landscape

Differences have emerged in which types of tests are most commonly used in each of the APAC countries. For most of the region, rapid diagnostic tests (RDTs) for the NS1 antigen and IgG/IgM ELISA tests are commonly used in dengue diagnostics 1. RDTs are typically utilized as the initial screening choice for immediate clinical management, largely due to their fast turn-around-time (TAT) 1. Conversely, ELISA tests remain commonly used due to their superior accuracy and specificity over RDTs .1,4 Sitting at the highest tier of complexity and cost, RT-PCR tests – known for its high sensitivity and specificity – are limited to surveillance and specialized cases, and are mostly available only in national reference laboratories or private hospitals in high-income countries.[1,4]

Newer technologies, such as those based on isothermal PCR or on CRISPR workflows, are typically adopted only in higher-income countries, where they are generally seen in pilot/research studies. Countries such as Malaysia and Singapore tend to use ELISA tests for clinical decisions in teaching or public hospitals, while RT-PCR is used for severe cases in the ICU 1. In the Philippines, RT-PCR tests are mainly limited to research or surveillance use, while ELISA tests are used in hospital facilities or national labs 1. A consistent challenge across countries is that access to diagnostics is limited in rural areas [1].

Meanwhile, RDTs have become widely adopted in Indonesia, the Philippines, Singapore, and Thailand to pave the way for faster clinical decision-making 1. In India, the use of RDTs is not recommended due to the variable sensitivity and specificity levels of these assays 1. This issue has led to low clinician confidence in results from rapid tests across Asia, making it a common barrier to accessing these tests 1. Consequently, experts opined that clinicians may underutilise rapid tests even when they are appropriate, or rely too heavily on alternative tools such as complete blood counts [1].

The high cost and longer turn-around-time (TAT) of advanced dengue tests, such as RT-PCR and ELISA assays, often lead to clinician hesitancy in ordering these tests 1. While experts acknowledge that RT-PCR and ELISA assays offer superior accuracy and specificity over rapid tests 1,4 ,the need for a shorter TAT makes RDTs often the preferred initial screening choice for immediate clinical management 1. This trade-off between high accuracy on one hand and speed and affordability on the other could be important considerations, somewhat limiting adoption of the advanced dengue tests for high-volume routine use [1].

Room for improvement

With lab-based tests, results are often delayed due to manual reporting systems and a lack of laboratory automation 1. This extends the time it takes to diagnose a patient and begin appropriate treatment 1. Gaps in training have also emerged as a challenge; the lack of proper guidance or skilled personnel to interpret test results – especially from rapid diagnostic tests – is a significant barrier across many countries that can contribute to patient mismanagement [1].

Additionally, countries can maximize resource effectiveness by leveraging economies of scale through methods like tiered supply arrangements or bulk order procurement coordinated by the Ministry of Health 1. Transparently sharing data on these successful procurement models could help drive competitive efficiency, hence making testing more affordable 1. Moreover, test delivery can be further optimized through alternative financing structures, such as reagent rental agreements, or by seeking support from philanthropic organizations [1].

Overcoming these challenges will be important for delivering dengue diagnoses earlier and accelerating time to intervention, critical steps for reducing the risk of complications and for lowering fatality rates [1, 2]. Integrating diagnostic education into continuing medical education programmes and increasing formal training opportunities for test use and interpretation will be key steps in this process [1].

Note: Insights referenced from the 2025 Advancing Diagnostics Roundtable Report represent participating experts' opinions.

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Expert Interview: From Automation to Augmentation- How Artificial Intelligence is Re-Shaping Clinical Laboratory Workflow

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Moderator & Corresponding Author:

Prof. Pradeep Kumar Dabla, Director Prof. & Head, Department of Biochemistry, G.B.Pant Institute of Postgraduate Medical Education & Research (GIPMER), NABL Quality Council of India Lead & Technical Assessor Medical Laboratories ISO 15189:2022 & PTP ISO 17043:2023, INDIA; pradeep_dabla@yahoo.com

Prof. Tony Badrick, Chief Research Officer. The Royal College of Pathologists of Australasia Quality Assurance Programs (RCPAQAP), AUSTRALIA; tony.badrick@rcpaqap.com.au

Experts:

1. **Prof. Damien Gruson, PhD**
   Head of the Department of Clinical Biochemistry,
   Cliniques Universitaires Saint-Luc, Brussels, BELGIUM
2. **Prof. S. Kanagaraj, PhD**
   Department of Mechanical Engineering at IIT Guwahati, INDIA
3. **Prof. Kazuhiko Kotani, MD, PhD**
   Jichi Medical University, JAPAN
4. **Prof. Egon Amann, PhD**
   Professor Emeritus of the University of Applied Sciences in Hamm-Lippstadt, GERMANY
5. **Prof. Manu Kumar Shetty, MD**
   Department of Clinical Pharmacology, Maulana Azad Medical College
   New Delhi, INDIA
6. **Dr Bernard Gouget, PhD**
   President of the National Committee for the Selection of Reference Laboratories, Frenc
   Ministry of Health, FRANCE
7. **Christopher-John L. Farrell, PhD**
   Clinical Director, Department of Biochemistry, New South Wales Health Pathology, Penrith,
   AUSTRALIA

Introduction:

Laboratory medicine is shifting beyond traditional automation into an era of intelligent AI-driven augmentation. AI is transforming analytical workflows from standardized, linear processes into adaptive, predictive systems that actively support clinical decisions. These technologies enhance quality management, improve diagnostic accuracy, and facilitate earlier and more accurate interpretation across various disciplines. As laboratories become data-driven ecosystems, professionals move from operating instruments to overseeing algorithmic performance, validating digital tools, and collaborating with clinicians to deliver patient-centred diagnostics. This evolution also brings critical challenges, including data integrity, algorithmic transparency, ethical governance, and new regulatory and cybersecurity demands. Understanding how AI will reshape workflows, competencies, and responsibilities is essential for laboratories aiming to remain resilient and competitive. This questionnaire examines the opportunities and constraints that define the transition from automation to proper augmentation.

Questions:

Q1. How will AI redefine the analytical workflow in medical laboratories over the next 5 years?



Prof. Damien Gruson

Over the next five years, AI will shift laboratory workflows from linear automation to intelligent, end-to-end orchestration. AI-driven middleware will enable real-time sample prioritization, dynamic quality control, automated validation, and the contextual interpretation of results across disciplines. This evolution toward "hyperautomation" will reduce manual interventions, shorten turnaround times, and improve reproducibility. Crucially, AI will integrate laboratory data with clinical and imaging information, transforming laboratories into proactive diagnostic hubs that support value-based care rather than volume-driven testing.



Prof. S. Kanagaraj

It is expected that in the next 5 years, the AI system will be able to tabulate the details of the patient and be able to define a workflow that the patient has to perform while in the laboratory, which will enable the clinician to extract maximum information from a minimum number of tests, thereby reducing the strain on both the patients and clinicians.



Prof. Kazuhiko Kotani

Analytical processes are related to laboratory errors, and risk mitigation will be done using AI. For instance, AI might be helpful for clot detection, wrong tube identification, and serum quality assessment based on hemolysis, icterus, and lipemia. Sample reaction for critical values is also detectable. The widespread adoption will depend on demonstrable explainability, prospective multi-center performance validation, and robust integration with laboratory information systems and middleware. Such tools are expected to improve the workflow.



Prof. Egon Amann

AI will shorten the analytical workflow tremendously. High-throughput labs will become ultra-high-throughput labs. Human resources will become smaller; fewer personnel will process ever increasing number of tests. Cost-pressure will be enhanced by AI. Labs with "traditional" approaches (e.g., those that will not fully embrace and apply AI) will be left behind. The gap between "resource-rich" and "resource-limited" labs (countries) will become larger. As a result, the support of those resource-limited countries by NGOs and other humanitarian organisations needs to be expanded.



Prof. Manu Kumar Shetty

The next five years will bring significant changes to medical laboratory workflows, though precise predictions are difficult due to rapid AI evolution. Experts anticipate a 40-50x improvement in AI capability by 2026 alone, with the possible emergence of AGI by around 2029. The impact will depend mainly on integration with Electronic Health Records. Developed countries are progressing well, while developing countries face challenges due to limited EHR adoption. Once integrated, AI will enable automated test selection, predictive diagnostics, automatic reporting, non-invasive biomarkers, home-based screening, and routine gene sequencing, shifting laboratories toward precision-driven diagnostics.



Dr. Bernard Gouget

Over the next five years, AI will transform laboratory workflows from reactive automation to predictive, adaptive systems. AI will orchestrate sample routing, prioritize urgent tests, and optimize analyzer utilization in real time. Quality control will become continuous and patient-based, detecting subtle drifts before failures occur. Predictive maintenance will reduce downtime, while intelligent reruns will replace systematic checks. Overall, AI will embed clinical context into analytical processes, shifting laboratories toward risk-centered, self-optimizing ecosystems that deliver faster, safer, and more clinically relevant results.



Dr. Christopher-John L. Farrell

Changes are likely to be substantial for disciplines that benefit from image analysis. Changes are already emerging in haematology, with red cell morphology pre-reading, microbiology, with automated plate reading, and histology, with flagging of suspicious areas and automated feature counting (e.g. mitotic figures).

In clinical chemistry, AI is likely to enhance already highly automated systems, optimising sample scheduling and tailoring instrument maintenance to real-time requirements. Identification of analytical issues should improve through enhanced analysis of traditional and patient-based quality control results. Post-analytical error detection and auto-verification procedures are also set for dramatic improvements.

Q2. What emerging AI technologies show the highest potential for improving diagnostic accuracy in clinical chemistry?

Prof. Damien Gruson

The highest-impact AI technologies include machine learning-based decision support systems, multimodal models integrating chemistry, hematology, molecular, and clinical data, and AI-enhanced mass spectrometry workflows. Algorithms for pattern recognition and anomaly detection improve result validation, reduce analytical errors, and identify clinically relevant discordances. In parallel,

AI-supported automation in LC-MS and molecular platforms enhances standardization and traceability, bringing reference-level accuracy into routine practice. Together, these technologies strengthen diagnostic precision while supporting scalable, high-throughput laboratory operations.

Prof. S. Kanagaraj

Explainable AI (XAI) show strong potential to improve diagnostic accuracy in clinical chemistry by combining predictive performance with transparency. These methods clarify how individual biomarkers influence diagnostic outcomes, enabling clinicians to validate AI decisions against established biochemical knowledge. By making model reasoning visible, explainable AI enhances trust, reduces diagnostic uncertainty, and supports safer clinical adoption of advanced analytical tools.

Prof. Kazuhiko Kotani

Patient-based real-time quality control (PBRTQC) contributes to the results of routine patient tests to detect analytical bias, and it may improve diagnostic accuracy in clinical chemistry. Conventional PBRTQC methods rely on moving averages and moving medians; however, integrating AI can enhance sensitivity to systematic shifts and address operational challenges, such as false alarms. Such AI-enabled, advanced PBRTQC frameworks are considered to be one of the technologies that can support improved analytical accuracy. Adding it to diagnostic tools of clinical pictures using AI will further aid diagnostic accuracy with high patient care.

Prof. Egon Amann

This is hard to predict. AI technologies are no “wonder-land”. They are based on existing experiences/publications and large language models. AI hallucinations may work against improved diagnostic accuracy. On the other hand, new clinical chemistry techniques, including gene sequencing, genetic tests, PCR-based tests, as well as POC tests will certainly benefit from new AI technologies.

Prof. Manu Kumar Shetty

In the next five years, advanced AI systems, Agentic AI, including early AGI-like models, are expected to significantly improve diagnostic accuracy. Unlike current AI models that depend on large datasets, future systems will be able to reason, generalise, and learn effectively from smaller datasets. These models will generate biologically meaningful synthetic data, improve the interpretation of rare and borderline cases, and enhance outcome prediction. Simultaneously, the declining cost of whole-genome sequencing will make it routine. Integration of genomics, biochemical data, clinical history, and longitudinal trends will transform clinical chemistry into a knowledge-driven diagnostic discipline.

Dr. Bernard Gouget

The most promising technologies include agentic AI for closed-loop quality actions, uncertainty-aware AI that provides confidence levels, and multimodal models integrating biomarkers with clinical data and trends. AI-driven interference detection will identify subtle analytical artifacts beyond traditional indices. Digital twins will enable personalized biological baselines, while knowledge- augmented large language models will support structured, explainable interpretations. Together, these approaches will move clinical chemistry from isolated result validation to integrated, patient-centered diagnostic intelligence, significantly improving specificity, consistency, and early detection of clinically meaningful abnormalities.

Dr. Christopher-John L. Farrell

Machine learning models work well with the numeric data generated in clinical chemistry. Explainable AI (XAI) approaches are particularly attractive for quality control, trustworthiness, and regulatory reasons.

The use of machine learning will facilitate greater integration of results: across clinical chemistry test panels, across time, and across pathology disciplines. There will also be greater integration of clinical data from electronic health records. Enhanced analysis of integrated data will give diagnostic insights outside traditional care pathways, highlighting for clinicians diagnoses they might not have considered based on the patient's presenting complaint or that are yet to manifest clinically.

Q3. How will the role of laboratory professionals evolve as AI systems handle more routine tasks?

Prof. Damien Gruson

As AI assumes routine, repetitive tasks, laboratory professionals will evolve from operators to clinical and digital experts. Their role will increasingly focus on supervising AI systems, interpreting complex results, ensuring clinical relevance, and communicating actionable insights to clinicians. New competencies will emerge in data literacy, AI governance, and quality oversight. Rather than replacing professionals, AI augments their expertise, allowing them to act as "orchestrators of diagnostics" and key contributors to integrated, value-based patient pathways.

Prof. S. Kanagaraj

As AI systems will be able to handle most of the managerial, workflow allotment and interpretation tasks by themselves, it will thus reduce work stress from the laboratory professionals, thereby increasing their efficiency in clinical tests. However, it is required that professionals are given the option to review the interpretation of the tests provided by the AI.

Prof. Kazuhiko Kotani

The professionals can conduct AI verification and take greater responsibility for the use and the results.

Prof. Egon Amann

Less hands-on work, more computer work, including sophisticated AI programming / test adaptations. More AI know-how in training and education will be a "must".

Prof. Manu Kumar Shetty

As AI and robotics increasingly handle routine laboratory tasks, the role of laboratory professionals will change substantially. Semi-autonomous or humanoid robots will manage sample processing, analysis, and reporting, while professionals focus on oversight, validation, and quality assurance. Human expertise will remain essential for specialised and complex testing. Laboratory professionals will increasingly monitor AI systems, design new diagnostic protocols, lead research, and drive innovation. Although the number of routine staff may reduce, demand will grow for highly skilled professionals with strong domain knowledge, AI literacy, and research capability, shifting the role toward clinical-diagnostic leadership.

Dr. Bernard Gouget

As AI automates repetitive tasks, laboratory professionals will evolve into supervisors of intelligent systems and clinical partners. Their focus will shift to biological risk arbitration, complex case interpretation, and multidisciplinary dialogue with clinicians.

They will lead AI governance, including validation, explainability, bias control, and performance monitoring. Professionals will also design predictive quality strategies and oversee dashboards of uncertainty and risk. Rather than replacing expertise, AI will augment it, enabling laboratorians to concentrate on clinical value, patient safety, and strategic leadership.

Dr. Christopher-John L. Farrell

The role of laboratory professionals will likely move up the value chain, with greater focus on quality, governance, and liaison activities. New skills will be required within these realms and greater cross-disciplinary knowledge will be required as AI drives integration of pathology disciplines.

New quality activities will include validating and monitoring AI models. Detecting model drift, hidden failure modes, and bias will be important. Laboratory professionals will be involved in troubleshooting incorrect model predictions. Clinical liaison will also change. Laboratory professionals will need to be able to give advice about the predictions from models, particularly when they are unexpected.

Q4. What are the major risks, ethical considerations, and regulatory challenges to remain competitive and resilient in an AI-enhanced diagnostic ecosystem?

Prof. Damien Gruson

Major challenges include data bias, lack of transparency, automation bias, and unclear liability when AI influences clinical decisions. Regulatory fragmentation, limited post-market surveillance, and insufficient explainability threaten trust and adoption. Ethical deployment requires robust data governance, human oversight, and alignment with international frameworks such as the EU AI Act and WHO guidance. To remain resilient, laboratories must embed ethics-by-design, ensure continuous performance monitoring, and invest in workforce training to critically evaluate AI outputs.

Prof. S. Kanagaraj

The major risks are the elimination of the human factor while assigning a treatment regime to a patient, especially in a country like India, with Universal healthcare. In addition to that, there is also a risk to the privacy of our healthcare history, which may be used unethically for dynamic pricing of insurance premiums.

Prof. Kazuhiko Kotani

The “black-box” nature of AI systems is an ethical concern. Privacy and security also remain risks, including re-identification of anonymized data and information leakage. Regulatory differences in national stances on AI governance are also of concern. The European Union, through the AI Act, takes a precautionary approach that prioritizes transparency, accountability, and safeguards, whereas the United States relies mainly on sector-specific guidance and existing legal framework. Such differences may indicate the need for international coordination to support fair competition for AI.

Prof. Egon Amann

“Patient safety first” principle and ethical considerations will not change, but will remain steady. New risks may appear with more dependence on AI. This could be counteracted by usual, maybe even enhanced, validation and verification testing, as is the case with new clinical tests and new assays.

Prof. Manu Kumar Shetty

A major risk is rapid AI and AGI development without sufficiently mature regulatory frameworks. While unsafe AI tools are unlikely to be widely adopted, partial or poorly regulated implementations can still cause harm, particularly in developing countries. Ethical concerns include accountability for errors due to bias, data limitations, or system failures. Regulatory frameworks are likely to evolve reactively in response to adverse outcomes. Key challenges include biased algorithms, vendor-locked systems, lack of transparency, and profit-driven design. Healthcare AI must remain open, explainable, interoperable, and patient-centric, supported by strong ethical oversight and proactive regulation.

Dr. Bernard Gouget

Major risks include algorithmic bias, model drift, silent errors, cybersecurity threats, and overreliance on automation. Ethical priorities are equity, transparency, data protection, and maintaining human accountability for clinical decisions. Regulators face challenges in managing adaptive AI as evolving medical devices, requiring continuous validation, traceability, and real-world monitoring. Laboratories must ensure explainability, robust governance, and resilience with fallback procedures. Success will depend on deploying trustworthy AI that balances innovation with safety, compliance, and sustained patient-centered responsibility.

Dr. Christopher-John L. Farrell

One risk is inappropriate levels of trust. Laboratories will not benefit from accurate models that staff do not trust and consistently overrule. However, healthy levels of mistrust are required so we can identify when model performance degrades.

Ethically, it is essential that models are fair for all patient groups. It is also important that we do not unduly disadvantage patients with rare diseases or atypical presentations.

From a regulatory perspective, requirements should be considered early during in-house model development. For third party models, there should be good collaboration with the vendor, with transparency and sufficient scope of audit rights.

Concluding remarks

The AI transformation is irreversible. The competitiveness and resilience of laboratories will depend on their ability to deploy AI that is trustworthy, governed, auditable, and ethically robust. The question is no longer “AI or not AI,” but rather which AI to use, under what control, with what responsibility, and for what clinical value. Laboratories that institutionalize AI as a core discipline of their quality system, alongside metrology and accreditation, will turn this revolution into a sustainable strategic advantage. From automation to augmentation, AI is redefining the value of the laboratory at the heart of patient care.

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Experts Curriculum Vitae:

1. Prof. Damien Gruson

Is the Head of the Department of Clinical Biochemistry at Cliniques Universitaires Saint-Luc, Brussels, and holds a teaching and research position within the Endocrinology, Diabetes, and Nutrition research unit at UCLouvain. He serves as Chair of the IFCC Emerging Technologies Division and is a board member of the Royal Belgian Society of Laboratory Medicine and the Belgian Thyroid Club. Prof. Gruson is a Fellow of the European Society of Cardiology, the Heart Failure Association, and the AACC Academy

2. Prof. S. Kanagaraj

Is a Professor of Mechanical Engineering at IIT Guwahati, India. He is specialised in biomaterials, biomedical devices, and assistive technologies. A PhD from IIT Kharagpur with post-doctoral work in Portugal, he has authored over 100 publications, holds multiple US and Indian patents, and has supervised several PhD scholars working in biomedical innovation. He has established key research labs at IITG, leads major national initiatives in biomedical device development, and currently heads the Jyoti & Bhupat Mehta School of Health Sciences and Technology. Several of his lab's technologies are already in patient trials, and his students have successfully launched startups in this space.

3. Prof. Kazuhiko Kotani

MD, PhD is a full Professor at Jichi Medical University & Department of Clinical Laboratory Medicine. He is a specialist of community medicine, and his research is focused on community healthcare design, health promotion, and disease prevention. He is an expert of biomarker science (i.e., lipids and lipoproteins), and has a research theme of the pathophysiology as well as management of cardiometabolic diseases, especially familial hypercholesterolemia (FH).

4. Prof. Egon Amann

Is an independent consultant in Life Sciences, Quality Systems and Clinical Chemistry. He is Professor Emeritus of the University of Applied Sciences in Hamm-Lippstadt, Germany, and was an Honorary Professor at Philipps University in Marburg, Germany. He has long-time experience in the pharmaceutical and diagnostic industries. He was executive employee with Behringwerke AG, Dade Behring Diagnostics, Siemens Healthcare Diagnostics, and Hoechst AG in Germany. He spent many years in human vaccine and human plasma protein R&D and in diagnostic assays development in Germany, Japan and the US. He has 18 patents granted and > 100 peer-reviewed publications, and several book chapters in the areas listed above. He is also serving Chair of the IFCC TF-GLQ (Task Force on Global Lab Quality).

5. Prof. Manu Kumar Shetty

Is a distinguished Professor of Clinical Pharmacology at Maulana Azad Medical College, New Delhi and a passionate AI in healthcare innovator with 8yrs of experience in machine learning, data mining, and predictive model development. He effectively blends deep clinical insight with advanced computational tools to drive meaningful diagnostic and therapeutic innovation. Dr Shetty is the recipient of the 2023 Lab2Market IndiaAI Award (Government of India) for his work on an Explainable ECG-based AI model. He actively engages in research, education, mentorship, and startup support, bridging healthcare and technology to improve patient outcomes and empower the next generation of medical professionals.

6. Dr. Bernard Gouget

Is the President of the National Committee for the Selection of Reference Laboratories at the French Ministry of Health, France and former President of the Healthcare Division at the national body of accreditation COFRAC. He previously served as Associate Professor of Physiology at Paris Cité University (Necker Children's Hospital). He is currently Secretary of the IFCC Emerging Technologies Division Executive Committee, Chair of the IFCC Task Force on History, and IFCC/EFLM Labac representative

7. Dr. Christopher-John L. Farrell

Is the Clinical Director at Liverpool in Sydney. He trained in chemical pathology at Royal North Shore Hospital and Laverty Pathology. After obtaining Fellowship in 2012, he continued with Laverty Pathology, eventually becoming Director of Clinical Chemistry and Laverty Pathology. Dr. Chris has a keen interest in the education and training of pathologists and scientists. He was previously the NSW/ACT education representative for the Australasian Association for Clinical Biochemistry and Laboratory Medicine (AACB) and is currently on the AACB Board of Examiners. In his research, he is currently interested in the use of laboratory data to answer clinical questions, streamline laboratory workflows and improve analytical quality.

Blood Lead Level Screening among Beauticians in Kathmandu: A Pilot Study

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Authors

Keyoor Gautam[1], Vivek Pant[2], Devish Pyakurel[1], Santosh Pradhan[2], Abha Shrestha[1], Neha Neupane

[1]Department of Pathology, Samyak Diagnostic Pvt. Ltd., Kathmandu, Nepal

[2]Department of Clinical Biochemistry, Samyak Diagnostic Pvt. Ltd., Kathmandu, Nepal

Corresponding Author:

Dr. Vivek Pant

Department of Clinical Biochemistry, Samyak Diagnostic Pvt. Ltd., Kathmandu, Nepal

Mobile: +977 9841486789

Email: drvpant@gmail.com

Abstract

Lead exposure from cosmetics is a growing public health concern, especially for beauticians who handle such products daily. In Nepal, weak regulatory oversight allows the circulation of counterfeit cosmetics containing high lead levels. This pilot study assessed blood lead levels (BLLs) among beauticians attending a health camp organized by the Cosmetics Society.

Forty-five beauticians with at least one year of experience participated. Blood samples were analyzed using anodic stripping voltammetry (detection limit: 3.3 µg/dL). Seven participants (20%) had elevated BLLs above this threshold, ranging from 3.5 to 16.0 µg/dL.

Findings suggest that beauticians are at occupational risk of lead exposure. Regular BLL screening, improved hygiene practices and stricter regulation of cosmetic products are recommended. Larger studies analyzing other toxic elements are warranted to better understand exposure risks in this group.

Keywords: Blood lead level; Cosmetics; Lead toxicity

Introduction

Today, working as a beautician has become a highly favored and widespread profession, with an increasing number of women choosing this career. Additionally, many women frequently visit beauty salons for various appealing services, including facials, skin care treatments, hair coloring, and other beauty-related services. To offer these treatments, a range of cosmetics and hygiene products are utilized, such as creams, deodorizing sprays, bleaching agents, hair sprays and gels, mascara, perfumes, colognes, shampoos, detergents, lipsticks, lotions, cleansers, and oil. However, these chemicals have the potential to be sources of lead poisoning.

Lead has been used as an ingredient in eyelid cosmetics, such as kohl (gazal), for centuries.1 The presence of lead in other cosmetic products has raised significant concerns, particularly in countries where regulatory frameworks are either absent or not rigorously enforced. In contrast, developed nations have established stringent policies that are diligently followed, ensuring strict monitoring of lead content in cosmetics. However, in Nepal, a report has revealed alarmingly high levels of lead in various brands of lipsticks, hair dyes, and other cosmetic products.

These products, whether imported into Nepal or manufactured domestically, are often counterfeit and falsely labeled with the names of well-known international brands. This issue persists due to the lack of accountability for authorized suppliers and registered manufacturers within the country.

Several inorganic and organic lead compounds being adulterated in these consumers product are toxic to health, including lead acetate, lead carbonate, lead chromates, lead oxide, lead sulfide, lead tetroxide, and tetraethyl lead. These compounds can cause spasms in the capillaries and arterioles, and can bind to tissues such as the brain and bones. Lead compounds may also inhibit sulfhydryl enzymes, disrupting their function. Additionally, lead can interfere with heme synthesis, leading to anemia, hemolysis, and the release of immature red blood cells. In the central nervous system, lead can damage nerve cells and myelin sheaths, causing cerebral edema. Lead toxicity also affects the kidneys, leading to nephritis, and can impair reproductive health, potentially causing infertility.

Lead exposure remains a critical public health issue due to its toxic effects, even at low levels. Beauticians, frequently exposed to cosmetics and beauty products potentially containing lead, are at an increased risk. To the best of our knowledge, there has been no comprehensive study in Nepal investigating lead levels in beauticians, despite the fact that many beauty products contain high levels of lead. This pilot study aims to address this gap by examining lead exposure among beauticians in the region.

Methods

This pilot study was conducted during a health camp organized by the Cosmetics Society. Beauticians attending the camp were invited to participate. Inclusion criteria included working as a beautician for at least one year and regular use of cosmetics.Blood samples were collected from each participant using standard venipuncture techniques. The samples were analyzed for lead content using anodic stripping voltametry (Meridian Bioscience). A blood lead level (BLL) above 3.3 µg/dL was considered the threshold for elevated blood lead levels.

Results

Participant Characteristics:

A total of 45 beauticians participated in the study. The average age was 32 years, with a range from 22 to 45 years. The average duration of employment in the beauty industry was 3.2 years.

Blood Lead Levels:

There were seven participants (20%) having detectable BLLs exceeding the 3.3 µg/dL threshold. The maximum detectable BLL was 16.0 µg/dL and minimum was 3.5 µg/dL.

Discussion

Our findings suggest that, Nepalese beautician are at risk due to exposure to lead-containing cosmetics. Hand washing appears to effectively remove lead from the hands, thereby preventing oral ingestion of lead present in cosmetics. Implementing safer working practices could further reduce or eliminate detectable blood lead levels among beauticians. It is important to note that this pilot study was intended as a screening exercise and did not investigate associations with other factors known to elevate blood lead levels. Nevertheless, the findings underscore the importance of regular BLL screening for beauticians and stricter regulation of lead content in cosmetic products.

It is important to recognize that cosmetics are not only adulterated with lead but also contain other heavy metals, such as cadmium, arsenic, and chromium. A study conducted among beauticians in Iran demonstrated that the urinary levels of potentially toxic elements were significantly higher in women occupationally exposed to cosmetics compared to a control group.3 In our study, we analyzed only the lead levels; therefore, it is crucial that future research on occupationally exposed individuals consider the analysis of additional toxic elements.

In the present study, we employed anodic stripping voltametry for the detection of blood lead levels, which has a lower limit of detection of 3.3 µg/dL. As a result, we were unable to calculate the mean blood lead level for the participants, representing a limitation of our study. Additionally, we did not collect cosmetic products used by the beauticians for lead level analysis, despite the known high lead content in cosmetics available in Nepal. It is important to note that this study was intended as a screening exercise.

Conclusion

This pilot study highlights the occupational risk of lead exposure among beauticians. Regular health monitoring and stricter cosmetic regulations are recommended to mitigate this risk. Further large-scale studies are warranted to confirm these findings and develop comprehensive occupational health guidelines.

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Expert Interview-The Role of National Accreditation Bodies in Advancing ISO: 15189 Accreditation in Developing Nations

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Moderator and Corresponding Author

Dr.Vivek Pant, Department of Clinical Chemistry, Samyak Diagnostic Laboratory, Kathmandu, Nepal

Email: drvpant@gmail.com

Experts

Dr. Thuppil Venkatesh, PhD

Professor Emeritus at St John's Medical College Bangalore, India
Director of the Foundation for Quality India (FQI)
Lead/Principal Assessor for the NABL & NABH

Dr. Sitaram Joshi, PhD

Former DG of Nepal Standards Bureau and an expert of metrology and accreditation
CEO, Accreditation Education Research & Scientific Service Centre (AERSSC), Nepal

Dr. Keyoor Gautam, MD

Consultant Onco-Pathologist and Quality Expert
Chairman, Samyak Diagnostic Pvt Ltd, Kathmandu, Nepal

Introduction

Following the previous APFCB News edition's focus on the implementation and impact of ISO 15189 in clinical laboratories, this issue shifts attention to the critical enablers of sustainable accreditation: national accreditation bodies (ABs) in developing nations. While international standards provide the framework, it is often the presence or absence of a credible, locally-rooted accreditation body that determines whether laboratories can achieve and maintain compliance.

In many low-resource settings, the journey toward ISO 15189 accreditation is constrained by limited access to impartial, affordable, and context-sensitive assessment services. Establishing a functional national accreditation body involves navigating challenges such as building technical capacity, ensuring governance impartiality, securing international recognition, and fostering stakeholder trust all while operating within constrained resources.

This edition's expert interview brings together practitioners who have been directly involved in establishing, governing, or strengthening national ABs in developing countries with Nepal as an example. Their firsthand experiences provide real-world insights into the operational, strategic, and collaborative efforts required to build accreditation systems that are not only compliant with international norms such as ISO/IEC 17011, but also responsive to local healthcare needs.

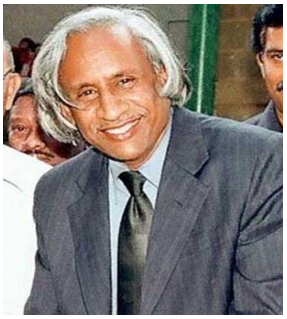
Through their perspectives, we explore:

- The necessity of local accreditation bodies in promoting scalable and sustainable quality improvement.

- Structural and operational challenges in building credible Accreditation bodies.
- Strategies for capacity development, stakeholder engagement, and integration into national health systems, and
- The long-term vision for accreditation as a pillar of laboratory quality and patient safety in emerging economies.

Questions

Why is a nationally recognized Conformity Assessment body important for the sustainable adoption of ISO 15189 in developing countries?



Dr. Thuppil Venkatesh

For a developing country, a nationally recognized, competent, and ILAC-signatory Conformity Assessment Body (CAB) which is accredited as per 17011:2017 is the most appropriate for sustainable adoption of ISO 15189. It transforms the standard from a costly imported certificate for a few into a scalable, locally-owned tool for systemic healthcare improvement. It builds the permanent institutional capacity that turns an international standard into a national reality, ensuring better patient outcomes, efficient use of resources, and integration into the global health community. In the absence of such nationally recognized CAB

a. A. few rich labs get expensive foreign accreditation.
b. The government has no domestic mechanism to lift standards for hundreds of other public labs.
c. Quality remains fragmented and unequal.
d. Public health decisions are based on unreliable data.
e. The country remains perpetually dependent on foreign technical assistance.
f. The adoption of ISO 15189 stalls and is seen as an elite, unsustainable cost.

Nationally recognized CAB's are the cornerstones of national quality infrastructure in their respective countries. Their recognition by ILAC/IAF means that a medical laboratory accredited by, for example, India's NABL, QAI, IQAS or South Africa's SANAS to ISO 15189, is considered technically competent on par with one accredited by a European or American body. This is essential for:

a. Patient Safety: Reliable lab results domestically.
b. Public Health: Trustworthy disease surveillance data.
c. International Trade: Acceptance of exported goods (food, pharmaceuticals) without costly re-testing.
d. Economic Development: Building a reputation for quality and attracting investment



Dr. Sitaram Joshi

A nationally recognized conformity assessment body provides ownership, sustainability, and contextual relevance to ISO 15189 implementation. Without a local accreditation body, laboratories depend on foreign accreditation services, which are costly, episodic, and often disconnected from national health priorities. Further, Nepal's laboratories particularly those in public hospitals and provincial facilities cannot sustainably rely on foreign accreditation bodies due to cost, logistics, and limited contextual understanding of national regulatory and health system realities.

A national body ensures continuity, affordability, and alignment with public health systems, while strengthening regulatory oversight and confidence in laboratory results. From Nepal's perspective, a nationally recognized conformity assessment body such as AERSSC, established as a formal accreditation body aligned with ISO/IEC 17011, is essential for the sustainable adoption of ISO 15189 because it embeds quality and competence within the national health system rather than treating accreditation as an external or donor-driven activity.

Nepal's National Laboratory Policy clearly emphasizes quality, reliability, and standardization of laboratory services across all levels of the health system. In this context, AERSSC provides a locally governed, nationally accountable accreditation mechanism that accredits medical laboratories to ISO 15189 and testing and calibration laboratories to ISO/IEC 17025 through a structured accreditation lifecycle, independent decision-making, and defined governance and impartiality safeguards. Through this role, AERSSC enables Nepal to institutionalize ISO 15189 within its own regulatory and service delivery framework, ensuring continuity, affordability, national ownership, and long-term sustainability.



Dr. Keyoor Gautam

A nationally recognized CAB will help create credibility and trust in the local accreditation system which will in turn encourage the local laboratories to adopt ISO 15189. The local regulatory requirements and ISO documents can be integrated into a national guideline for more clarity on the user's perspective. This also would help develop awareness regarding laboratory accreditation and its importance to the community as well as strengthen confidence of doctors regarding laboratory results.

Once the CAB is nationally recognized, it will help create uniformity in laboratory accreditation and will make it more accessible and cost effective for the laboratories

As awareness is generated, the need for local assessors will be in demand, hence creating more local expertise, which will lessen our reliance on foreign resources. This will help develop local as well as international confidence in our system of accreditation.

2. What are the most significant structural and operational challenges in establishing an impartial and competent national accreditation body in low-resource settings?

Dr. Thuppil Venkatesh

The most significant structural challenges are:

1. Political & Legal Framework
2. Economic & Financial Sustainability.
3. Human Capital & Institutional Culture

The most important operational challenges are

1. Technical Competence Development.
2. Impartiality Management.
3. Infrastructure & Market Challenges

The Implied Solutions are

a. Strong Legal Foundation First: Begin with a robust law guaranteeing independence. Phased Sectorial Approach: Start with one high-priority sector (e.g., medical labs for public health, or calibration labs for trade) to build credibility and a success story.
b. Strategic Partnerships: "Twinning" with an established National Accreditation Bodies (e.g., SANAS, NABL, QAI) for long-term mentorship, not just short-term projects.
c. Integrated Donor Support: Donors must fund system-building, not just isolated training, and support the AB's core operational costs during the long start-up phase.
d. Build Regulator Demand: Work intensively with ministries of health, environment, and trade to make accredited conformity assessment a regulatory requirement.

In essence, the challenge is not just technical but deeply socio-political. It involves building a new institution that embodies principles of neutrality, expertise, and transparency in an environment where those principles are often in short supply. The most significant challenge is transforming the mind-set from seeing accreditation as a certificate to be procured, to understanding it as a systemic public good that underpins health, safety, and economic growth.

Dr. Sitaram Joshi

The key challenges include ensuring institutional and functional independence, securing sustainable financing, and developing competent human resources. In low-resource settings, accreditation bodies often operate within government ecosystems, making impartiality and freedom from political influence a constant concern. Even as an independent entity, AERSSC must continuously demonstrate impartiality, transparency, and technical independence through governance structures, conflict-of-interest controls, and separation of assessment and decision-making functions.

Operationally, limited numbers of trained assessors, uneven laboratory maturity across federal, provincial, and local levels, and the absence of fully digitalized accreditation systems constrain effectiveness. These challenges are compounded by limited financial resources and the need to build credibility while simultaneously developing systems, people, and trust. In Nepal,

maintaining institutional independence while working closely with the Ministry of Health and Population and other regulators requires careful governance, strong ethical frameworks, transparent decision-making, and phased development aligned with national health system reforms.

Dr. Keyoor Gautam

A lot of challenges emerge right from the conception of the idea of establishing a CAB in low resource settings.

Firstly, the accreditation body has to convince the government that it has not been established to take away the governments authorities. Privately run CAB has not been easily accepted by the government agencies and they are hesitant to even promote them. They would rather belief and promote CAB from other countries, rather than rely, nurture and uplift their own. I remember in 2015 when we received our accreditation certificate. No officials from the Ministries of Health, Finance, or Industry attended, citing a lack of policy on whether a private body could grant accreditation. This experience highlights the need for clearer government support and collaboration to formally recognize and validate the impartiality of local accreditation bodies. Financial sustainability is another major factor which limits the growth of the organization.

Lack of skilled and competent man power in a major operational challenge. Assessors must be trained well, but more importantly should have conducted assessments to raise their competence. Nepal is a small country hence a lot of conflict of interests are seen when it comes to choosing a local assessor. They rather prefer someone from out of the country, so that their technical flaws are not exposed locally.

3. **How can a developing country ensure that its national accreditation body meets international requirements (e.g., ISO/IEC 17011) without relying heavily on external resources?**

Dr. Thuppil Venkatesh

Developing countries can build an internationally compliant National Accreditation Body (NAB) that meets ISO/IEC 17011 with minimal long-term external dependency by adopting a strategic, phased, and resource-maximizing approach focused on self-reliance from the outset. Complete initial isolation is unrealistic, but the goal is to rapidly internalize competence and systems. The framework for achieving this is moving from foundational steps to operational sustainability. This can be achieved by laying the unshakeable foundation, building core competence with internal resources and achieving operational sustainability.

The self-reliance can be achieved through:

a. Challenging internal solution (Minimizing External Reliance)
b. Legal Authority & Impartiality supporting a strong accreditation act with governance and financial autonomy.
c. Lack of experts recruit can be overcome by involving national technical institutions and using intensive internal "learn-by-doing" on a pilot sector.
d. Cost & sustainability to be supported by domestic demand via regulation; using a sliding-scale fee model and aiming for legislated financial self-sufficiency.

e. For technical validation one can use national Technical Expert Committees (TECs) for decision-making; develop national PT schemes.
f. For gap analysis one can hire a single, targeted foreign expert for a defined review, not a long-term consultancy and culture of impartiality enforce through strict conflict-of-interest rules and use of transparency process (public web portals) as a disciplinary tool.

Dr. Sitaram Joshi

This can be achieved through phased implementation, peer learning, and regional cooperation. In Nepal, AERSSC has focused on internal capacity development and gradual alignment with ISO/IEC 17011, rather than heavy dependence on external consultants. Structured self-assessments against the standard, risk-based internal audits, and management reviews are used to benchmark operations against international requirements while retaining national ownership and cost control.

Rather than full reliance on international consultants, AERSSC prioritizes staff competency development, participation in regional accreditation networks, and engagement with international forums. This approach has culminated in the submission of AERSSC's Mutual Recognition Arrangement (MRA) application to APAC, along with all required documentation, demonstrating growing maturity and commitment to international accreditation norms.

Dr. Keyoor Gautam

The first step towards to building strength in any organization is its manpower. The national accreditation body itself needs to get trained regarding both structural and operational requirements to be fulfilled as per ISO 17011. Capacity building has to be focused upon with the development of an efficient and reliable team. External support, resources and guidance will definitely be needed in the preliminary stages but there should be a gradual transition focusing on self-sustainability and self-sufficiency.

4. What strategies are effective in building local technical assessor capacity for ISO 15189, especially in regions with limited training infrastructure?

Dr. Thuppil Venkatesh

Building local technical assessor capacity for ISO 15189 in regions with limited training infrastructure requires a shift from conventional, resource-intensive "fly-in expert" models to innovative, low-cost, and self-perpetuating strategies. The goal is to create a sustainable internal pipeline of expertise. Firstly one needs to adopt strategic selection & "Seed Core" development. Then one has to consider low-infrastructure, high-impact training modalities followed by creating a sustainable practice ecosystem. Final step is to leverage the existing systems & partnerships creatively.

The key strategies for effective building of local technical assessors are to stop thinking of "training" as an event and start building it as a system. By investing first in a small, committed master core, leveraging peer-based practical exercises like mock assessments, and using low-bandwidth digital tools and local partnerships, a country can build a robust, home-grown cadre of ISO 15189 assessors. This approach not only builds capacity but also ensures the assessment process is culturally and contextually relevant, which is essential for sustainable improvement in local laboratories. The most effective training infrastructure is not a building with projectors, but a well-designed process of peer-led, practice-based learning.

Dr. Sitaram Joshi

The National Laboratory Policy highlights the development of competent human resources as a cornerstone of laboratory quality. AERSSC operationalizes this by identifying and training assessors from Nepal's existing laboratory workforce, including public hospitals, national reference laboratories, academic institutions, regulatory bodies, and professional councils.

A competency-based assessor development framework is applied, supported by mentorship and supervised assessments. To date, AERSSC has organized 12 batches of ISO 15189 and ISO/IEC 17025 training, creating a growing national pool of assessors. Blended learning approaches combining online instruction with practical, supervised field assessments have proven effective in reaching assessors across provinces, even where training infrastructure is limited. Experienced assessors from the region, including India, have supported mentorship and calibration during early phases.

but have not been able to develop their competency due to lack of opportunity to assess laboratories. So, there can be an initial hand holding with any foreign accreditation body. With this hand holding, the local assessor can voluntarily attend a minimum of 5 to 10 assessments in foreign countries within the region and develop their skills, which can then be applied locally to develop their own competency and also share knowledge to their peers. This will help develop local technical assessor capacity for ISO 15189.

5. **How should a national accreditation body engage with government, laboratories, and international bodies to foster trust and credibility?**

Dr. Thuppil Venkatesh

CAB need to align with National Priorities.

a. Map to national development plans: proactively demonstrate how a robust accreditation system supports key national goals: public health (reliable diagnostics), industrialization (quality exports), SDG achievement (good health, clean water).

b. Co-develop sectorial roadmaps: Work with the Ministries of health, agriculture, and to create mandatory accreditation roadmaps for critical sectors (e.g., all reference labs for pandemic diseases to be accredited by Year X).

c. Demonstrate value, not just cost: produce impact data: regularly report metrics: "Accreditation of good number of water testing labs has reduced waterborne disease outbreaks in regions A, B, C." or "Our accredited certification helped 200 SMEs access export markets."

d. Translate technical activity into socio-economic outcomes. Uphold independence while being accountable: Formalize a "Memorandum of Understanding (MoU)": Have a clear, public MoU with relevant ministries that defines roles: the government sets policy and regulatory requirements; the NAB provides independent technical conformity assessment. This clarifies separation of powers.

e. Transparent Governance: Include government representatives on the Governing Board, but as one voice among many (industry, academia, and consumers), ensuring the NAB is not captured by any single interest.

f. Serve as a technical advisor: Proactively advise on legislation and regulations that involve conformity assessment, ensuring they are effective, non-discriminatory, and aligned with international best practices (WTO/TBT principles).

g. Engaging with laboratories & industry: From Auditor to Value-Added Partner Engaging with international bodies: From Applicant to Peer The NAB is a strategic asset for national development, not a cost centre. Laboratories fairness & added value provide affordable guidance & pre-assessments.

Run a transparent, independent appeals process. The NAB is here to help us improve and be more competitive, not just to punish us. Actively participate in international committees for technical competence & integrity. Undergo and openly learn from peer evaluation. This NAB operates at the same professional level as its global peers; its results can be trusted worldwide.

Dr. Sitaram Joshi

The National Laboratory Policy calls for coordinated action among regulators, service providers, and partners. Trust is built through transparency, consistency, and technical integrity. With laboratories, AERSSC emphasizes guidance, clarity of requirements, and predictable processes rather than enforcement alone, particularly for public sector laboratories that form the backbone of Nepal's diagnostic services.

Engagement with government focuses on aligning accreditation with national health objectives such as laboratory strengthening and universal health coverage while safeguarding technical and decision-making independence. International engagement through regional networks, observer participation, and MRA processes demonstrates alignment with global accreditation practices and builds confidence in AERSSC's accreditation decision

Dr. Keyoor Gautam

The local accreditation body should have good working terms with the local government so as to avoid any conflict of interest. They can hold various workshops for the concerned government officials which will foster trust in them. Regular updates on the accreditation body status and activities should be shared with the government. The benefits of accreditation and how it has helped the community get accurate result for proper treatment has to be shared with the concerned government officials.

There should be a close relationship between the CAB and the laboratories. The CAB should be readily accessible to the laboratories for their accreditation needs which may be training, document preparation, logistic, facilitation of calibration agencies etc. Also CABs competency is reflected by its ILAC signature status. Hence MRA recognition will definitely help foster trust and credibility at the same time discourage other international accreditation agencies to encroach. CAB also has to gain trust from the international bodies by taking MRA status which is highest status that it can attain. They have to actively participate in regional bodies activates and show them our willingness to develop our local agencies despite in a resource limited setup.

6. In what ways can a local accreditation system make ISO 15189 more accessible and affordable for laboratories in the public and private sectors?

Dr. Thuppil Venkatesh

A well-designed local accreditation system is the single most powerful lever to make ISO 15189 accessible and affordable for laboratories in developing countries.

It directly tackles the two greatest barriers: high cost and perceived complexity. CAB need to build the value of the local accreditation mark through-

a. Create public awareness campaigns: educate clinicians, hospital administrators, and the public that the national accreditation symbol means reliable results. This drives patient choice toward accredited private labs.

b. Also reciprocity with key partners: secure Mutual Recognition Agreements (MRAs) with neighbouring countries or major trade partners. This means a locally accredited lab's results are accepted for cross-border patient care or export testing, eliminating the need for costly dual accreditation.

Dr. Sitaram Joshi

A local accreditation system significantly reduces costs by eliminating foreign assessor travel, using local expertise, and applying context-appropriate fee structures. AERSSC promotes stepwise and phased implementation of ISO 15189, allowing laboratories to progressively meet requirements rather than treating accreditation as a one-time, high-cost hurdle.

Providing guidance documents, training workshops, and gap assessment support enables laboratories across district, provincial, and private sectors to engage meaningfully with quality improvement. Anchoring accreditation within the National Laboratory Policy reassures laboratories that ISO 15189 adoption is an integral component of national health system strengthening, not an optional or temporary initiative. The recent submission of AERSSC's MRA application further reinforces confidence in the long-term recognition and credibility of national accreditation

Dr. Keyoor Gautam

There is a misconception among hospital administrators and laboratory professionals in Nepal that laboratory accreditation with ISO 15189 are synonymous to NABL, which is an Indian accrediting body. I used to get a lot of queries where they asked is your accreditation an ISO or NABL? The local accreditation body should work on creating awareness among the stakeholders so that they build the trust and confidence of the local accreditation system.

Another misconception is that the local accreditation body is just a local organization providing ISO certificates and has no linkage to the regional accreditation body and to ILAC. This has to be addressed and made to understand that this local accreditation body has its roots till the ILAC.

7. What are common barriers laboratories faces when seeking accreditation through a new or emerging national body, and how can these be addressed?

Dr. Thuppil Venkatesh

When laboratories in a developing country engage with a new or emerging National Accreditation Body (NAB), they face a distinct set of barriers that go beyond the general challenges of implementing ISO 15189. These barriers stem from the perceived and real risks of investing in an unproven system.

Barrier 1: Lack of trust & credibility in the New NAB

Barrier 2: Inconsistency and inexperience of assessors

Barrier 3: Unclear value proposition and Return on Investment (ROI)

Barrier 4: Prohibitive Cost and Resource Burden
Barrier 5: Cumbersome and opaque processes

A new NAB must recognize that its first challenge is not to assess labs, but to create a willing and confident customer base.

It must act not as a passive judge, but as an active facilitator and partner. By proactively addressing these fears through transparency, support, and a clear demonstration of value, the emerging NAB can build a virtuous cycle: early labs succeed, their success builds the NAB's reputation, which attracts more labs, creating a sustainable ecosystem of quality. The goal is to make the path to accreditation clear, achievable, and demonstrably worthwhile.

Dr. Sitaram Joshi

Common barriers include limited awareness, concerns about assessor consistency, fear of unpredictable decisions, and questions regarding international recognition. These are natural concerns in the early stages of a national accreditation body. AERSSC addresses them by ensuring assessor competence, applying accreditation criteria uniformly, maintaining transparent decision-making, and clearly communicating alignment with ISO 15189 and ISO/IEC 17011.

Building a track record of credible assessments, documenting processes, and progressing toward regional and international recognition arrangements are essential to strengthening laboratory confidence over time.

Dr. Keyoor Gautam

An emerging national accreditation body faces a lot of hurdles in establishing itself and building confidence locally as well as internationally. Additionally the laboratories themselves are skeptical regarding the local CABs authority.

NABL and accreditation has been taken synonymously due to our proximity to India as well as a lot of technical staff would have been trained there. If a laboratory take accreditation through a new emerging national body, if has to go through the pain of defending themselves regarding the accreditation that they have taken. It takes time for the community to realize and accept the fact that this local accreditation body is also equally capable as other countries accreditation body.

Another challenge is that the new accreditation body would not have created the technical manuals for laboratories to follow in all departments. This forces the laboratories to rely upon other international bodies technical recommendations

8. **How can risk-based thinking and continuous improvement be embedded into the operations of a young accreditation body?**

Dr. Thuppil Venkatesh

A new NAB must recognize that its first challenge is not to assess labs, but to create a willing and confident customer base. It must act not as a passive judge, but as an active facilitator and partner. By proactively addressing these fears through transparency, support, and a clear demonstration of value, the emerging NAB can build a virtuous cycle: early labs succeed, their success builds the NAB's reputation, which attracts more labs, creating a sustainable ecosystem of quality. The goal is to make the path to accreditation clear, achievable, and demonstrably worthwhile.

Risk-based thinking means proactively identifying what could go wrong, assessing its impact, and acting to prevent or mitigate it in all decisions and processes. It could be embedded as

A. Formalize a simple, action-oriented risk management system
B. Institutionalizing continuous improvement
C. Build feedback loops into every core process
D. Establish clear improvement mechanisms
E. Integrating both into organizational culture & leadership

For a young NAB, risk-based thinking is its nervous system, sensing threats and opportunities. Continuous improvement is its muscle memory, allowing it to learn and adapt with every action. By baking these principles into simple, routine processes from day one and, crucially, by having leadership live them, the NAB builds inherent resilience and a reputation for maturity. This proactive, learning posture is the strongest possible signal to laboratories, government, and international peers that this is a body that can be trusted for the long term.

Dr. Sitaram Joshi

Risk-based thinking should be integrated into governance, planning, assessment, and decision-making processes from the outset. At AERSSC, risks related to impartiality, assessor competence, workload, and decision-making integrity are systematically identified and mitigated through defined controls, committee oversight, and internal reviews.

Continuous improvement is driven through internal audits, management reviews, corrective action systems, and stakeholder feedback mirroring the same quality culture expected of accredited laboratories. By modeling these practices internally, AERSSC reinforces national expectations for quality, accountability, and continual improvement under the National Laboratory Policy.

Dr. Keyoor Gautam

Embed risk-based thinking by integrating proactive risk analysis into all core activities such as strategic planning, assessment scheduling, and decision-making using simple, context-appropriate tools. Drive continuous improvement by systematically learning from data on non-conformities and stakeholder feedback, and by building staff capacity in risk assessment and root-cause analysis. Anchor this with leadership commitment and align it with international best practices through active peer engagement, ensuring the body evolves as a credible, resilient, and trusted institution from the beginning.

9. What lessons can be learned from existing national accreditation bodies in other developing regions?

Dr. Thuppil Venkatesh

The experiences of established National Accreditation Bodies (NABs) in developing regions offer a rich repository of practical wisdom. Their journeys marked by both successes and setbacks provide crucial lessons that can save new or emerging NABs years of trial and error.
Lesson from across developing regions is this: A successful NAB is built on a strategic triad:

1. Political Legitimacy: Anchored by a clear legal mandate and aligned with national development goals.

2. Technical Credibility: Forged through international peer recognition and uncompromising impartiality.
3. Operational Viability: Sustained by a viable financial model and a robust ecosystem of support services.

The journey is iterative, not linear. Setbacks are inevitable. The key is to institutionalize learning from each audit, each stakeholder complaint, and each peer evaluation finding. The NAB that learns faster than its environment changes is the one that endures and becomes a cornerstone of national competitiveness and public trust.

Dr. Sitaram Joshi

Key lessons include the importance of starting small but strong, prioritizing credibility over speed, and investing early in human capital. Successful bodies emphasize regional cooperation, shared learning, assessor exchange, and incremental expansion of scope. Experience from other developing regions shows that accreditation bodies succeed when they are policy-anchored, technically credible, and progressively developed.

For Nepal, regional collaboration and shared learning provide practical pathways to strengthen AERSSC while respecting national priorities and resource constraints. Institutional integrity and technical competence rather than size or funding level remain the foundations of international trust.

Dr. Keyoor Gautam

A collaborative approach and hand holding is required among newly established accreditation bodies so that the credibility of the regional body (APAC) as well as the apex body (ILAC) is maintained. A MRA status for a local accreditation body would give it its highest achievement which can foster trust locally and internationally. Nepal has faced difficulty in renewing its MRA status due to lack of collaborative efforts from regional counterparts. A hand holding approach among regional bodies would help uplift the local body.

10. Looking forward, what innovations or partnerships could help national conformity assessment bodies in developing nations thrive and gain wider recognition?

Dr. Thuppil Venkatesh

The trajectory for National Conformity Assessment Bodies (NCABs) in developing nations is not about merely catching up with traditional models, but about strategic leapfrogging. By leveraging targeted innovations and forging non-traditional partnerships, they can build greater efficiency, credibility, and impact.

The path to wider recognition and thriving success for developing nation NCABs lies in reframing their role. They must transition from being costly replicas of the western institutions to becoming agile, digitally-native hubs of quality assurance that are deeply integrated into their regional economies and aligned with future global trends (digitalization, sustainability).

By embracing innovation not as a luxury but as a necessity for scale, and by forging partnerships based on shared challenges and mutual benefit rather than donor dependency, these bodies can achieve something profound: they can set new global benchmarks for how to deliver credible, affordable, and impactful conformity assessment in the 21st century. Their constraint-born innovations may well become the model for others to follow.

Dr. Keyoor Gautam

Digitalization of all the accreditation procedures would help create more transparency to work done by the CAB. A digital network of all the accredited laboratories and their accredited test list would help the newer labs to perform inter-laboratory comparisons of their tests. A paper less system can be developed for all communications as well as assessment of the laboratories.

In the context of partnership in Nepal, the first role of an accreditation body would be to convince the Nepalese government that not all accreditation bodies should be governmental, where private bodies do exist though out the world. Governmental support would help foster and strengthen the accreditation bodies credibility and somewhat ease the governments work of ensuring quality in the laboratory sector. The government can supervise international accreditation bodies from operating locally, as their market driven approach can prioritize accrediting more laboratories over ensuring rigorous quality, leading to compromised technical standards. Hence the government should support the local accreditation body which has more answerability to the local community.

Experts Curriculum Vitae:

Dr. Thuppil Venkatesh

A key architect of quality standards in South Asia, Dr. Thuppil Venkatesh combines his academic role as a Professor Emeritus at St. John's Medical College with his leadership of the Foundation for Quality India. His extensive practical experience is demonstrated through his work as a Principal Assessor for India's NABL and NABH, and his strategic guidance as Chairman of the Laboratory Accreditation Committee of Nepal.

Dr. Venkatesh's expertise, honed through committee roles with the Dubai Accreditation Centre and other international bodies, is focused on a critical mission: building sustainable, locally-driven accreditation systems in developing economies. An established name in ISO 15189, he actively cultivates the next generation of quality professionals by conducting high-level training for auditors and assessors throughout the Asia-Pacific region.

Dr. Sitaram Joshi

As CEO of Nepal's Accreditation Education Research and Scientific Services Centre (AERSSC), Dr. Sitaram Joshi leads an independent ISO/IEC 17011-compliant accreditation body. Building on his prior role as Director General of the Nepal Bureau of Standards and Metrology, he has been pivotal in fortifying national quality infrastructure.

His vision has elevated AERSSC into a recognized authority, providing impartial assessments to testing, calibration, and medical laboratories. The body's international engagement is marked by its ILAC Associate and APLAC Full Membership. Dr. Joshi is widely esteemed for his expertise in metrology, standardization, and accreditation, driving advancements in laboratory quality and competence throughout the region

Dr. Keyoor Gautam

A recognized authority in South Asia's quality landscape, **Dr. Keyoor Gautam** specializes in fortifying national accreditation systems in developing countries. His career is marked by a transformative milestone:

leading the establishment of Nepal's first ISO-accredited laboratory under a domestic accreditation body, a decisive step that validated the potential of locally-led systems.

Operating as a Lead Assessor for ISO 15189, Dr. Gautam provides strategic guidance on framework development, assessor training, and quality system implementation for emerging bodies. His work, which spans the Asia-Pacific region, is driven by a commitment to creating sustainable, accessible, and risk-proactive accreditation models that meet international standards.

Conclusion

For labs in developing nations, lasting quality depends on one thing: a strong, local accreditation body. This turns global standards into practical, affordable tools for all. The path is clear: the body must be trustworthy and fair, must actively work with labs and the government, and must itself practice the risk management and continuous improvement it asks of others. The goal is not just to grant certificates, but to build a self-sustaining culture of quality that protects patients and strengthens the entire health system. As the experts have articulated, such an institution is not merely a service provider but a cornerstone of national quality infrastructure.

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Why expanding access to accurate dengue tests is a critical need in Asia\



Mr. Marvin Chan

Corresponding Author

Product Manager (Core Lab), Roche Diagnostics Asia Pacific

Email: marvin.chan@roche.com

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The viral infection known as dengue is an increasing public health threat. In 2024, the World Health Organisation received reports of 14.6 million cases of this mosquito-borne virus – a historic high, with infections endemic in more than 100 countries [1]. That number is presumed to be a significant undercount; experts estimate that there are between 100 million and 400 million dengue infections every year [1].

Dengue is a major and growing global health threat, now endemic in more countries than ever before, primarily affecting tropical and sub-tropical climates [1, 2]. Yet, the severity of the threat is often underestimated because many infected patients experience no symptoms or only mild ones – such as high fever, headache, pain in the joints and muscles, nausea, vomiting, and a rash[2].

This initial mild presentation makes the disease particularly dangerous because dengue virus can occasionally cause severe disease and even death [1]. The risk of severe disease is greater in people infected by dengue more than once (secondary infection) [1, 2]. Severe dengue includes dengue hemorrhagic fever or dengue shock syndrome [2] and can lead to complications such as internal bleeding, organ damage, shock which can be fatal [2]. These symptoms of severe dengue may include severe abdominal pain, persistent vomiting, bleeding in the gums or nose, blood in vomit, urine or stools, heavy menstrual bleeding, lethargy or change in alertness, and breathlessness – indicating a potentially life-threatening complication [1, 3].

The global cost of this severity is high; in 2024, the WHO recorded nearly 12,000 deaths related to dengue [1]. Since dengue is diagnosed in only a fraction of infected individuals, most patients are unlikely to know whether they have been infected before, obscuring their potential risk for severe disease in the future.

As a healthcare threat, dengue is persistent in Asia, with varying levels of endemicity across the region. According to reported data, the Philippines, Vietnam, Indonesia, Thailand, India, and Malaysia have some of the highest infection prevalence rates in the region, although for countries like India and Indonesia the global burden of disease estimates are much higher [4]. Thus, underreporting appears to be an issue that falsely depicts disease burden, leading to

Rapid diagnosis and test access

While there is no cure for dengue, effective prevention and control measures include rapid diagnosis, preventing mosquito bites and control of mosquito population [2]. Rapid detection allows public health teams to implement outbreak measures quickly to prevent spread within a community [6]. WHO has also found that access to medical care when cases are detected early can reduce the fatality rate of severe dengue to less than 1% [1, 7].

Dengue infection is primarily diagnosed in the laboratory by detecting the virus through the NS1 antigen and the host's antibodies – IgM and IgG – depending on the phase of the illness [8, 9]. The most widely used testing technologies in Asia include ELISA and rapid diagnostic tests [9]. According to the report of the 2025 Advancing Diagnostics Roundtable convened at the sidelines of the Asia Dengue Summit and conducted by Vista Health, while RT-PCR tests are typically more accurate and sensitive, their use is generally limited to national public health laboratories for surveillance purposes, due to their high pricing and long turnaround time [10].

Unfortunately, there are many barriers to accessing dengue diagnostic tests. The report revealed turnaround times for these tests vary widely; countries including Indonesia, Malaysia, and Singapore often deliver results faster than others [10]. In addition, health systems may lack the training needed to run dengue tests, and inefficient workflows limit the number of labs willing to offer them [10]. Diagnostic performance varies across dengue tests [8]. Inconsistent specificity and sensitivity across these tests reduce their adoption [10].

Direct patient access to tests is also a challenge, as highlighted in the report [10]. In India and Thailand, for example, diagnostic and patient care access are heavily centralised, limiting access at the community level [10]. In other countries, diagnostics are available at the community level: barangays (public community primary healthcare facilities in the Philippines); puskesmas (public community health clinics in Indonesia); klinik kesihatan (public community health clinics in Malaysia); and general practitioner clinics in Singapore [10].

Beyond cost, economic differences and the capacity of existing laboratory infrastructure are also key factors affecting access to dengue diagnostics. High-income countries such as Singapore are more likely to adopt advanced diagnostics and invest in innovation [10]. Upper-middle-income countries – like Malaysia, Indonesia, and Thailand – have strong laboratory networks, but access beyond urban areas is limited [10]. Lower-middle-income countries, including the Philippines and Vietnam, rely heavily on rapid diagnostic tests with limited lab infrastructure available [10].

Recommendations for improvement

Fortunately, experts in diagnostics and public health at the Advancing Diagnostics Roundtable offered several recommendations that could expand access to rapid dengue testing in Asian countries. For example, countries may build on cross-border collaborations and pooled procurement to reduce diagnostic costs and improve supply chain efficiency [10]. This would require formalising partnerships among countries and sharing cost/benefit data for various test types [10].

Training and education are other areas where changes could improve outcomes. Integrating diagnostic education into medical school curricula and continuing medical education programmes could help practitioners get up to speed about what's available and how to use

dengue tests [10]. Online classes or workshops could also help with this, as would updating national guidelines to integrate recommended diagnostic workflows and testing algorithms [10].

Finally, engaging stakeholders can be a powerful step. Establishing partnerships with national reference labs and research institutes can support test validation, training, and broader rollout of diagnostics, while teaming up with academic societies and advocacy groups can help raise awareness of the value of diagnostics alongside vaccination and surveillance programmes. Alongside those, setting up public-private partnerships can also support wider distribution of key tests [10].

Looking ahead

Expanding access to rapid, reliable dengue diagnostic tests is important and feasible – but it won't be easy. Public health officials and clinical laboratory teams alike will have to overcome skilled personnel shortages, infrastructure and equipment limitations, regulatory and policy hurdles, and an overall lack of awareness of the value of early detection. However, by working together and aligning on key goals, it should be possible to raise awareness of the need for tests, increase training among medical and laboratory professionals.

Note: Insights referenced from the 2025 Advancing Diagnostics Roundtable Report represent participating experts' opinions.

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Methylphenidate (Ritalin)-Induced Proteinuria: A Case Report of a Teenager with Reversible Renal Side Effects

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Dr. Gita Sharifi

Corresponding Author

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Email: gitasharifi1@gmail.com

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Abstract

This case report presents a school-aged student who developed transient proteinuria after short-term use of methylphenidate (Ritalin) for enhancing concentration during examination periods.

Methylphenidate (Ritalin) is commonly used for managing Attention Deficit Hyperactivity Disorder (ADHD). This case report highlights a rare adverse effect—proteinuria—in a young female who intermittently used Ritalin during academic exam periods. While initial short-term use in elementary school which was prescribed by a child psychiatrist due to suspected attention deficit showed no clinical symptoms or abnormal laboratory findings, repeated use in high school was associated with mild to significant proteinuria, which resolved after discontinuation. This case suggests a possible reversible nephrotoxic effect of Ritalin, warranting further investigation and cautious monitoring. [2,3]

Introduction

Proteinuria, defined as the presence of abnormal amounts of protein in the urine (usually more than 150 mg/24 hours), is a common laboratory finding that reflects abnormal permeability of the glomerular filtration barrier, which may result from a variety of renal and systemic conditions.[1] The causes of proteinuria range from benign transient conditions to serious glomerular diseases and include glomerular, tubular, overflow, and functional (transient)proteinuria. While glomerular diseases represent the most common causes for proteinuria, Drug-induced proteinuria is also recognized, with several medications (like NSAIDS, ACE inhibitors, some Antibiotics such as aminoglycosides) implicated in renal injury either by direct nephrotoxic effects or by altering renal hemodynamic.[4,5] Methylphenidate, commonly known as Ritalin, is a CNS(Central Nervous System) stimulant widely prescribed for the treatment of ADHD (Attention-Deficit Hyperactivity Disorder). While its cardiovascular, gastrointestinal, and neuropsychiatric complications are well documented, reports of its renal side effects are exceedingly rare.[2] However, emerging evidence suggests that Methylphenidate may affect renal function, potentially leading to proteinuria.[3]Although the exact incidence and clinical significance remain unclear, this case report highlights a rare but noteworthy association between Methylphenidate use and abnormal urinary protein excretion.[6]

Case Presentation

This case report describes a high school student with no physical history of renal disorder,

1 year, without evidence of vesicoureteral reflux as confirmed by VCUG (Voiding Cystourethrogram).

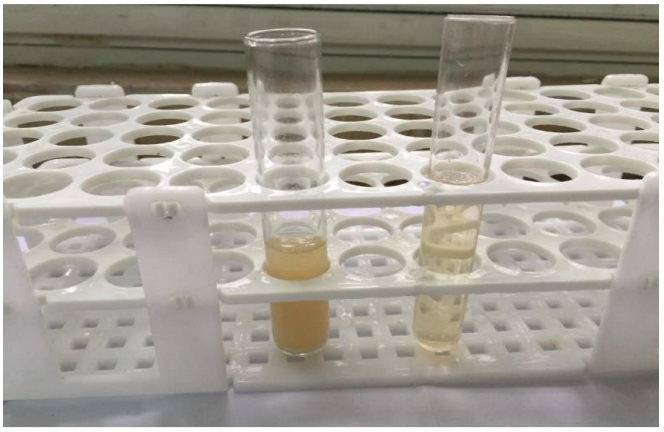
This female student was initially prescribed Ritalin 10 mg twice daily (morning and afternoon) in primary school due to suspected attention deficit, though symptoms did not persist and medication was soon stopped without adverse effects.

During high school, she resumed Ritalin use occasionally before exams, under medical supervision. At age 15 y, she took the medication 10mg once daily for a month, after which routine urinalysis showed mild (trace) proteinuria. The following year, after one week of similar Ritalin use, she developed marked proteinuria (2+ in qualitative method),meaning that laboratory analysis using the sulfosalicylic acid (3%) turbidimetric method confirmed high urinary protein.(Figures 1 to 3). Biochemistry autoanalyzer results revealed a random urine protein concentration of 1739 mg/L (reference range: 14–141 mg/L). After stopping the treatment, a follow-up 24-hour urine test showed 161.2 mg/24hr (normal: up to 150 mg/24hr), indicating improvement after discontinuation of the medicine.

She permanently ceased Ritalin use thereafter, with no recurrence of proteinuria.[2,3]

Figures: Actual photos of the case, showing sulfosalicylic acid precipitation reaction.

Figure 1: Random urine supernatant after centrifuging (right) and precipitation with sulfosalicylic acid (left). (Qualitative method for evaluating the amount of proteinuria)



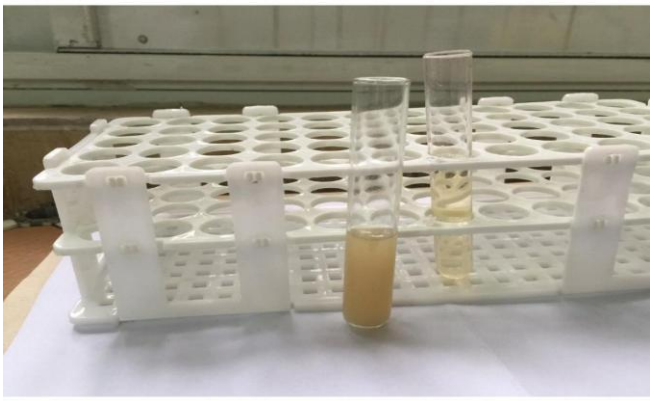


Figure 2: Protein precipitation visible after 5 minutes.

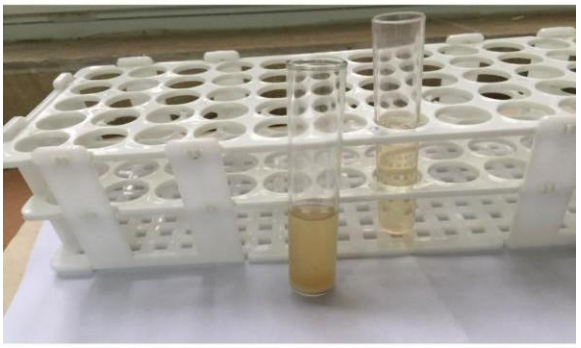


Figure 3: Protein precipitation visible after 10 minutes, (2+) reaction.

Discussion

To date, reports of proteinuria directly associated with Methylphenidate use are exceedingly rare in the medical literature.[3] While several cases of complications have been documented in patients receiving Methylphenidate, explicit documentation of proteinuria as a presenting feature is limited. This scarcity underscores the novelty and clinical significance of the present case. Reporting such uncommon adverse effects is crucial to raise awareness among clinicians about the potential renal implications of stimulant medications. Given the increasing prevalence of Methylphenidate use worldwide, especially in pediatric and adult ADHD populations, more vigilance and investigation into its renal safety profile and probable side effects and their mechanisms are warranted for further studies.

Methylphenidate, through its stimulation of the sympathetic nervous system and increased release of catecholamines such as norepinephrine and dopamine, places the body in a heightened state of physiological stress. This adrenergic surge can lead to vasoconstriction, elevated blood pressure, and altered renal hemodynamics.[6] Such changes potentially reduce renal perfusion and glomerular filtration rate, predisposing renal cells to ischemic stress. Cellular stress induced by hypoperfusion and oxidative stress may activate apoptotic pathways, leading to programmed cell death (apoptosis) in glomerular and tubular cells.[7,8] While direct cytotoxic effects of Methylphenidate on renal cells have not been definitively demonstrated, these indirect mechanisms suggest a plausible pathway for Methylphenidate-associated proteinuria via injury to the renal filtration barrier. Further research is necessary to elucidate the extent and clinical significance of these effects.

Hence, the underlying mechanism by which Methylphenidate (Ritalin) may induce proteinuria is not yet fully understood and remains speculative, but experimental studies have also suggested that Methylphenidate can reduce glomerular filtration rate and alter sodium handling, possibly due to renal vasoconstriction or sympathetic nervous system overactivation.[6,8] These hemodynamic changes may lead to transient glomerular injury, predisposing patients to proteinuria.

This case report emphasizes the importance of a comprehensive and detailed clinical assessment, including medication history, when evaluating patients with unexplained proteinuria, and identifying potential drug-induced causes is crucial for appropriate management and may prevent unnecessary diagnostic procedures.

Finally, although Ritalin is not typically associated with renal side effects, this case indicates a temporal relationship between Ritalin consumption and transient proteinuria. Further studies are needed to elucidate the potential nephrotoxic effects of Methylphenidate and their clinical implications. It is suggested that the next studies investigate the potential renal side effects of Methylphenidate, particularly its possible association with proteinuria. Moreover, further research is warranted to clarify whether such adverse effects may be more relevant in female children with a history of urinary tract infection.

Conclusion

In conclusion, this case report highlights a rare but important association between Methylphenidate use and the development of proteinuria. Although the precise mechanisms remain to be fully elucidated, possible hemodynamic alterations and cellular stress induced by sympathetic stimulation may play a role in renal injury. Clinicians should maintain a high index of suspicion for drug-induced renal effects when evaluating unexplained proteinuria, particularly in patients receiving stimulant medications. Methylphenidate is metabolized in the liver and primarily excreted via the kidneys, which may contribute to its potential renal effects, including proteinuria.[2,3,6] Further research is needed to clarify the underlying pathophysiology and to guide optimal management and monitoring strategies for affected individuals.As a result, Clinicians should be aware of the possibility of proteinuria as a rare side effect of Ritalin.[8,10] Monitoring urinary findings during prolonged or repeated use, especially in adolescents, may be prudent.[8,9]

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Conflict of Interest

The author declares no conflicts of interest. All of the tests were done in the author's Medical Lab.

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Quiz Section!!

Question 1

Which of the following is a characteristic of drugs for which measuring the blood drug concentration (Therapeutic Drug Monitoring, TDM) is considered useful?

1. The drug causes drug allergies.
2. The influence of metabolism and excretion is small.
3. Inter-individual differences in pharmacokinetics are small.
4. The therapeutically effective drug concentration range is wide.
5. The pharmacological effect correlates with the blood concentration.

Question 2

Which of the following statements about Deoxypyridinoline (DPD) are correct? Select two.

1. Urine is measured as the specimen.
2. It is low in osteoporosis.
3. It is high in bone metastasis from lung cancer.
4. It is a bone formation marker.
5. It is lower in females than in males.

Contributed by:
Dr. Ryunosuke Ohkawa, PhD

Professor of Clinical Analysis and Molecular Biology, Graduate School of Medical and Dental Sciences, Institute of Science Tokyo. Committee member of Communication & Publications Committee.

Answer Section!!

Answer for question 1

5: The pharmacological effect correlates with the blood concentration.

Therapeutic Drug Monitoring (TDM) involves measuring the concentration of a drug in the patient's blood to adjust the dosage regimen and individualize therapy, aiming to maximize efficacy while minimizing toxicity.

TDM is considered useful for drugs that possess several key characteristics.

The Most Essential Characteristic

5. The pharmacological effect correlates with the blood concentration.
Correct. This is the most fundamental prerequisite for TDM. If the clinical effect (both therapeutic and toxic) is reliably related to the drug's concentration in the blood, then measuring the concentration allows clinicians to predict and manage the patient's response.

Other Key Characteristics That Make TDM Useful

- Narrow Therapeutic Index (Window): TDM is highly useful for drugs where the effective dose is close to the toxic dose (e.g., Digoxin, Phenytoin, Lithium). If the therapeutic range is wide (Option 4), TDM is generally unnecessary.
- Significant Inter-individual Variability: TDM is useful for drugs where there are large differences in absorption, metabolism, or excretion among individuals (pharmacokinetics). If the individual differences are small (Option 3) and the influence of metabolism/excretion is small (Option 2), a standard dose is likely effective for most patients, and TDM is less necessary.
- Non-linear Pharmacokinetics: Drugs whose elimination becomes saturated (non-linear kinetics) can show a rapid, unpredictable rise in blood concentration with a small increase in dose, making TDM essential for safe dosing.

Evaluation of All Options

1. The drug causes drug allergies.
   Incorrect. Drug allergies are unpredictable immune responses unrelated to the drug's concentration. TDM cannot manage or prevent allergic reactions.
2. The influence of metabolism and excretion is small.
   Incorrect. If the influence is small and predictable, a standard dose is usually sufficient, making TDM less useful. TDM is useful when this influence is large and variable.
3. Inter-individual differences in pharmacokinetics are small.
   Incorrect. If the individual differences are small, a standard dosage is reliable. TDM is highly useful when the individual differences are large.

4. The therapeutically effective drug concentration range is wide.
   Incorrect. A wide range means that minor fluctuations in concentration do not significantly impact efficacy or safety, reducing the need for TDM. TDM is critical when the range is narrow.
5. The pharmacological effect correlates with the blood concentration.
   Correct. This is the central reason for performing TDM—to link measured concentration to patient outcome.

In summary, TDM is employed when a drug's therapeutic outcome is directly linked to its blood concentration, and that concentration is difficult to predict due to patient variability or a narrow therapeutic index.

Answer for question 2

1. Urine is measured as the specimen. , 3. It is high in bone metastasis from lung cancer.

   Deoxypyridinoline (DPD) is a specific and highly relevant bone resorption marker.

   DPD is a cross-linking amino acid derivative found in the collagen fibers of the bone matrix.

   When bone is broken down (resorbed) by osteoclasts, the collagen, along with DPD, is released into the bloodstream and subsequently excreted in the urine.

Evaluation of All Options

1. Urine is measured as the specimen.

   Correct. DPD is excreted by the kidneys after being released from bone. It is typically measured in urine (either random or first-morning urine), often normalized to creatinine concentration to account for variations in urinary volume.
2. It is low in osteoporosis.

   Incorrect. In osteoporosis, especially the type characterized by high bone turnover, bone resorption is accelerated, causing DPD levels to be elevated (high).
3. It is high in bone metastasis from lung cancer.

   Correct. Malignant bone metastases, particularly those causing lytic (bone-destroying) lesions, drastically accelerate the rate of bone degradation. Consequently, bone resorption markers like DPD become significantly elevated.
4. It is a bone formation marker.

   Incorrect. DPD is a product of collagen breakdown, making it a marker of bone resorption (breakdown), not formation. (Examples of bone formation markers include Osteocalcin (OC), Bone-specific Alkaline Phosphatase (BAP), and Procollagen Type I N-terminal Propeptide (P1NP).)
5. It is lower in females than in males.

   Incorrect. Due to accelerated bone resorption following menopause, females often show a tendency towards higher DPD levels compared to age-matched males.

Beautiful Terraced Rice-Fields in China

Dr Tan It Koon

Rice is the staple food of Asia and part of the Pacific. Over 90 percent of the world's rice is produced and consumed in the Asia-Pacific Region. Ideally, land used for rice plantation is flat with good irrigation. However, in many rice-growing countries, large areas are hilly or mountainous. Ingenious and resourceful local farming community turned the sloping areas into productive terraced farming fields' by cutting flat areas along the slope of hills and mountains in the form of graduated terraces to grow crops on all sides of hills and mountains.

Though labour-intensive, the method has been employed effectively to maximize arable land area in variable terrains and to reduce soil erosion and water loss. Besides rice, other crops with varying time for maturity and harvest are also cultivated at the same time, or at other times. Algae with bright colour grow on the surface of the still and shallow water in some of the terraces. These contribute to the fascinating and changing view of multi-coloured patches in the fields that appear like a modern abstract painting consisting of lines, geometrical shapes and colours.



In addition to their important primary role of rice and other crop production, the terraced fields are beginning to help generate additional income because of the unusual views they offer to city dwellers. The spectacular scenic beauty of some of these areas in the more remote parts of the Philippines, China and Vietnam are attracting the attention of avid travellers in more recent times. Photographs and video recordings captured on hand-phones and posted on the internet have helped publicize the scenic beauty of the terraced rice-fields, which are located at relatively undeveloped and inaccessible areas

With increasing demand for eager's visitors, they are becoming well-known and popular scenic spots and unique attractions for nature-loving tourists, artists and photographers. Roads and other relevant facilities for tourists are being developed to facilitate access to such places. Most spectacular: The fields are mainly divided into 3 scenic spots including Bada, Laohuzui (the Mouth of Tiger) and Duoyi Tree areas. All the terraced fields are situated on the hills with slope gradient varying from 15 to 75 degree. The highest mountain has about 3000 terraced fields from the bottom to the top.

This painting is inspired by my visits to the terraced rice-fields in China and captures my impression of the beauty and magnificence of the hilly areas which consist of numerous long irregular strips of land carved closely in parallel on slopes. Colour of the crops, algae, and the reflection of changing colour of the sky from the shallow water in each enclosed elongated strips of land give rise to an interesting jigsaw puzzle landscape painting with ever-changing variation in the shades and colours of its constituent pieces.