17th FAOBMB Congress

Phillip Nagley reports on the FAOBMB (Federation of Asian and Oceanian Biochemists and Molecular Biologists) aspects of BMH2024.

The 26th IUBMB–17th FAOBMB Congress held in Melbourne, from 22–26 September 2024 was dubbed BMH2024 for very good reason. The range of topics presented at the Congress under the broad Biomolecular Horizons umbrella is outlined by Leann Tilley (see pages 6–11 of this report). This report focuses on aspects relating to the FAOBMB.

Lectures Sponsored by FAOBMB

The Plenary talks were mainly sponsored by IUBMB and included the FEBS Worldwide Lecture. The named lectures sponsored by FAOBMB were Keynote Symposia, in which each lecture listed below was delivered as the first Keynote Talk in the session:

Osamu Hayaishi Lecture
Hozumi Motohashi (Tohoku University, Japan)
Supersulfides as an emerging biomolecule for stress response

Takashi Murachi Memorial Lecture
Yue Wan (Genome Institute of Singapore, Singapore)
Studying RNA structures to understand RNA function

Kunio Yagi Lecture
You-Me Kim (Korea Advanced Institute of Science and Technology, Korea)
Gpr43-mediated regulation of eosinophils in asthma

Jisnuson Svasti Lecture
Shobhna Kapoor (Indian Institute of Technology Bombay, India)
Chasing the functions of Mycobacterium tuberculosis *glycolipids during infection using membrane biophysics and chemical proteomics*

FAOBMB Lecture
Peter Fineran (University of Otago, New Zealand)
Defence and counter-defence strategies in the phage–bacterium arms race

FAOBMB Lecturer Peter Fineran.

These top-quality international speakers came from countries across the FAOBMB region and collectively covered many topics in biochemistry and molecular biology, with applications to biotechnology and medicine.

Ramachandran Lecture

On 24 September, a special session was held that included the GN Ramachandran Lecture supported by the Society of Biological Chemists, India. The Lecture was delivered by Raghavan Varadarajan (Indian Institute of Science, Bangaluru, India), who described his research into the development of efficacious, thermotolerant, viral vaccines. Such formulations have application for vaccines that can be distributed from a central depot with refrigeration facilities to areas where such cold storage facilities are unavailable. Dr Varadarajan has focussed on protein engineering to provide components of SARS-CoV-2 with enhanced immune-protective activity and, at the same time, to minimise supply chain requirements for refrigeration, especially towards the end point for delivery to resource-limited settings in developing regions.

Ramachandran Lecturer, Raghavan Varadarajan (centre), with Terry Piva, incoming FAOBMB Secretary General (left), and Sheila Nathan, outgoing FAOBMB Secretary General (right).

FAOBMB Awards

On the last day of the Congress, a special Keynote Symposium was held, which included lectures by the recipients of the FAOBMB Award for Research Excellence and the male and female recipients of the FAOBMB Young Scientist Awards (as stipulated by the benefactor, Yasuhiro Anraku, when the awards were inaugurated in 2006).

The recipient of the 2024 Award for Research Excellence was Ling-Ling Chen (Shanghai Institute of Biochemistry and Cell Biology, China), who spoke on 'Biogenesis, function and potential application of circular RNAs'. These interesting RNA species are covalently closed single-stranded transcripts with unique biogenesis, stability and conformation. Dr Chen showed how these molecules have great potential for controlling the expression of genes involved in human disease, such as the excessive activation of protein kinase R as occurs in Alzheimer's disease.

17th FAOBMB Congress

Right: Ling-Ling Chen receives the FAOBMB Award for Research Excellence from FAOBMB President Joon Kim.

Left: Carolina Gubert receives the FAOBMB Young Scientist Award from FAOBMB President Joon Kim.

Right: Shuofeng Yuan receives the FAOBMB Young Scientist Award from FAOBMB President Joon Kim.

The female FAOBMB Young Scientist Awardee for 2024 was Carolina de Moura Gubert (Florey Institute of Neuroscience and Mental Health, Melbourne), whose talk was entitled 'Depletion of the paternal gut microbiome alters sperm small RNAs and impacts offspring physiology and behaviour'. Her research explored the interesting aspects of how the gut microbiome of male mice affects the genetic inheritance of certain traits through the differential expression of small non-coding RNAs in sperm, which influences epigenetic inheritance and offspring development.

The male FAOBMB Young Scientist Awardee for 2024 was Shuofeng Yuan (University of Hong Kong, Hong Kong, China) whose talk was entitled 'Reprogramming host metabolism for broad-spectrum antiviral therapy'. His research aims at developing broad spectrum anti-viral therapies based on the metabolic changes in host cells after viral infection, particularly related to lipid biosynthetic pathways and glycolytic aspects. Examples of his approaches are the use of the lead compound AM580 that blocks lipid synthesis needed for viral replication, and treatment with D-mannose in order to disrupt glucose metabolism and, thereby, interfere with virus entry via modulation of cellular protein glycosylation.

FAOBMB COUNCIL MEETING

An FAOBMB Council meeting took place on 21 September, prior to the Congress. This annual business meeting of the Federation was well attended, with 14 delegates (or their alternates) of the 20 Constituent Members (National Societies or Groups of Biochemists and Molecular Biologists in the Asia-Oceania region) present in person, and a further two joined the meeting via Zoom. In his opening remarks, President Joon Kim briefed Council that normal activities of FAOBMB reconvened in 2023 and continued in 2024 with an in-person Executive Committee (EC) meeting from 9–11 May 2024 in Yogyakarta, Indonesia, as well as the FAOBMB Congress (BMH2024) in Melbourne. He also appreciated the support and understanding of all 20 societies of FAOBMB to achieve the Federation's aims to improve the quality of scientific education and research in the Asian and Oceanian countries. Professor Kim reiterated the importance of the relationship with other regional Federations and IUBMB for the future development of FAOBMB. To promote such interactions among FAOBMB and IUBMB, FEBS had invited him to the FEBS/IUBMB Congress which was held from 29 June–3 July 2024, in Milan, Italy.

Secretary General Sheila Nathan confirmed the results of the elections held during this year for two positions on the EC. The position of President-Elect will be taken up by Hans Hung-Lin Chung (Taipei, China) and that of Secretary General by Terrence Piva (Australia). These new EC members take up their positions on 1 January 2025. A meeting of the new Executive Committee will be held in Colombo, Sri Lanka, in January 2025 to facilitate a smooth transition of the leadership of FAOBMB.

17th FAOBMB Congress

Council noted its thanks to Akira Kikuchi for his dedicated contribution to FAOBMB as President-Elect (2019), President (2020–2022) and Past-President (2023–2024). Council also appreciated the great contribution of Sheila Nathan for six years of service as Secretary General since 2018 plus an additional year as Acting Secretary General during 2024. In addition, Sheila was Fellowships Chair (2014–2017), making a total of 11 years' service on EC.

The next annual scientific meeting will be the 31st FAOBMB Conference, to be held in Busan, Korea, from 20–23 May 2025 at BEXCO (Busan Exhibition and Convention Center). The meeting of FAOBMB Council will be held there on 19 May 2025.

Phillip Nagley (Monash University)

Incoming FAOBMB President-Elect, Hans Hung-Lin Chung.

Joon Kim promotes the 2025 FAOBMB Conference that will be held in Korea.

FEBS Worldwide Lecturer, Leo Eberl.

BMH2024 Congress Convenor, Leann Tilley.

17th FAOBMB Congress

Members of the FAOBMB Executive Committee, Delegates and Observers at the FAOBMB Council meeting.
Front row (from left): *Mi-Young Kim (Acting Delegate, Korea), Phillip Nagley (Archivist, Australia), Sarmoko Samidin (Observer, Indonesia), Nirma Samarawickrema (Education Chair, Australia), Rasika Perera (Fellowships Chair, Sri Lanka), Zengyi Chang (Past-President, China), Andrew Wang (Past President, Taipei China), Joon Kim (President, Korea), Rahmawati (Emma) Ridwan (Delegate, Indonesia), Usha Hettiaratchi (Delegate, Sri Lanka), Tilak Shrestha (Delegate, Nepal), Sheila Nathan (Secretary General, Malaysia), Shannon Au (Treasurer, Hong Kong China), Tae-Kyung Kim (FAOBMB2025 Representative, Korea).*
Back row (from left): *Neil H Tan Gana (Acting Delegate, Philippines), Edmund Lui, (Acting Delegate, Singapore), Pham Thi Tran Chau (Delegate, Vietnam), Terry Piva (Secretary General Elect, Australia), AHM Nurun Nabi (Delegate, Bangladesh), Koichi Homma (Delegate, Japan), Dong-Yan Jin (Delegate, Hong Kong China), Yau-Huei Wei (Acting Delegate, Taipei China), Supaart Sirikantaramas (Delegate, Thailand), Marc Kvansakul (Delegate, Australia), Chyan-Leong Ng (Delegate, Malaysia).*
Delegates absent from photo who attended Council meeting by Zoom: *Umesh Varshney (Delegate, India), M Waheed Akhtar (Delegate, Pakistan).*

Welcome Mixer, from left: Phillip Nagley, Stanley Xie and Yau-Huei Wei.

From left: Yau-Huei Wei, Leslie MM Dalmacio, Gracia FB Yu, Neil H Tan Gana and Phillip Nagley.

26th Ordinary General Assembly of the IUBMB

Terry Piva reports on the International Union of Biochemistry and Molecular Biology (IUBMB) aspects of BMH2024.

The International Union of Biochemistry and Molecular Biology (IUBMB) General Assembly was held on Tuesday 24 September 2024. Representatives from 33 countries attended in person along with other representatives who were online. Professor Marc Kvansakul and Associate Professor Terry Piva represented the ASBMB.

The IUBMB is the roof body for 77 National Societies of Biochemistry and Molecular Biology around the world. There are four Associated Regional Organisations through which IUBMB activities are coordinated on a more or less continental basis:

- FEBS – Federation of European Biochemical Societies
- PABMB – Pan-American Association for Biochemistry and Molecular Biology
- FASBMB – Federation of African Societies of Biochemistry and Molecular Biology
- FAOBMB – Federation of Asian and Oceanian Biochemists and Molecular Biologists

These regional organisations help the coordination of proposals for Congress and Conferences to IUBMB as well as being integrating bodies for National Societies in the various areas of the world.

IUBMB President, Alexandra Newton, addresses the BMH2024 Welcome and Opening.

The meeting was chaired by Professor Alexandra Newton (USA). At the start of the meeting, she gave her President's report, which was followed by the Treasurer's report delivered online by Professor Loredano Pollegioni (Italy). Following this, elections were held for positions on the Executive Committee (EC). Professor Sandhya Visweswariah (India) was elected President-Elect, Emeritus Professor Ilona Concha Grabinger (Chile) was elected unopposed for the position of EC Member for Congresses and Focused Meetings, and Professor James Murphy (Australia) was elected unopposed for the position of EC Member for Publications.

IUBMB General Assembly delegates.

The Assembly voted on admitting the United Arab Emirates Genetic Disease Association (UAEGDA) and the Biochemistry and Molecular Biology Section of the Science Society of Thailand (BMB Thailand) as Adhering bodies. The Assembly also approved the reinstatement of the Netherlands Society for Biochemistry and Molecular Biology (NVBMB) and the Nigerian Society of Biochemistry and Molecular Biology (NSBMB) as Adhering bodies.

I delivered a report on the 26th IUBMB Congress and Young Scientist Program (YSP) to the Assembly, which was followed by reports on forthcoming IUBMB-sponsored meetings, including a report on the 27th IUBMB Congress and YSP that will be held in 2027.

In her last duty as President, Professor Newton handed over the chair of the meeting to Professor Dario Alessi (United Kingdom) who gave his vision for the IUBMB, before closing the meeting. The next IUBMB Congress will be held in Cape Town, South Africa, from 19–23 September 2027.

Terry Piva (RMIT University)

Future, present and past IUBMB Presidents. From left: Sandhya Visweswariah, Dario Alessi and Alexandra Newton.

BIOMOLECULAR HORIZONS2024: DISCOVER CREATE INNOVATE / ComBio 2024 MELBOURNE 22nd COMBIO CONFERENCE

Leann Tilley, Convenor of Biomolecular Horizons 2024/ComBio2024

The Hon Ben Carroll MP, Deputy Premier and Minister for Education and Medical Research, formally opened the Biomolecular Horizons Congress. From left: Joon Kim (FAOBMB President), Erinna Lee, Alexandra Newton (IUBMB President), Ben Carroll, Leann Tilley, Ross Hannan (ASBMB President) and Frances Separovic.

The Biomolecular Horizons 2024 (BMH2024) Congress, hosted by the ASBMB, brought together three prestigious conferences – the 26th Congress of the International Union of Biochemistry and Molecular Biology (IUBMB), the 17th Congress of the Federation of Asian and Oceanian Biochemists and Molecular Biologists (FAOBMB), and the 22nd ComBio Conference.

From 22–26 September, BMH2024 welcomed 1,875 registrants from 44 countries to share new developments in biomolecular research, innovation and education. The largest international delegations were from South Korea, New Zealand, India, Japan and the USA.

The Program Committee, co-led by Stephanie Gras, Andy Hill and Wai-Hong Tham, and their team of more than 40 Stream Leads undertook the herculean effort of assembling the scientific program. They programmed over 500 talks, comprising seven Plenary sessions, including two presented by Nobel laureates, 34 Keynote Sessions, 77 Symposium Sessions, six Award Sessions, four Hot Topics Sessions and seven Technical Workshops. These were topped with four pre-Congress Satellite events, a Young Scientist Program, 60 Lightning Talks and over 600 posters. The BMH2024 program was diverse, equitable and scientifically excellent.

Satellites

The Program commenced ahead of the main Congress with a series of Satellite events. Gabby Watson and her team organised a Young Scientist Program (YSP) in Macedon with 36 attendees, selected through a highly competitive process (see page 12 of this report). The Korean Society for Biochemistry and Molecular Biology joined forces with ASBMB colleagues, led by Victor Anggono, to organise a Molecular Neuroscience Satellite at the Bio21 Institute. A follow-up meeting will be held in Korea in 2025 – an important legacy event. Donna Whelan put together a Biophysics Workshop. An Education Workshop was organised by Nirma Samarawickrema (see pages 13–15 of this report). Sarah Garnish and Tatiana Soares da Costa and their team organised a Career Development Forum (see pages 16–17 of this report).

Public Lecture

An exciting prelude to the main Congress was a Public Lecture held on 22 September, with 240 members of the public joining with the delegates for this exciting Grimwade Award Lecture. Uncle Ian Hunter welcomed attendees to Country and played the didgeridoo,with its evocative tones reverberating around the Plenary Hall. The Lecture featured Brian Kobilka, who was awarded the Nobel Prize in Chemistry 2012 for revealing the workings of G protein-coupled receptors (GPCRs). We learned that, amongst mammals, elephants have the most GPCRs and dolphins the fewest! Brian explored how GPCR signalling works and the difficulties in discovering drugs for these important receptors, using the μ-opioid receptor as an example. He explained how molecular studies of GPCRs underpin the development of new drugs that provide pain relief without causing addiction and other negative effects.

Grimwade Award Lecturer, Brian Kobilka, Nobel Laureate in Chemistry 2012. From left: Leann Tilley, Laura Edgington-Mitchell, Brian Kobilka, Angus Grimwade, Ian van Driel, Stephanie Gras, Waihong Tham and Andy Hill.

BMH2024 Meeting Report

Congress Opening

Monday morning saw the Presidents of the IUBMB (Alexandra Newton), the FAOBMB (Joon Kim) and the six ComBio partner Societies including the ASBMB on the stage for a spectacular Congress Opening. Djirri Djirri, a Wurundjeri women's dance group, provided cultural context and made an Acknowledgement of Country. The Hon Ben Carroll MP, Deputy Premier of the State of Victoria and Minister for Education and Medical Research, formally opened the Congress. He explained the importance of technology and innovation to Victoria and highlighted the value of meetings such as BMH2024 for fostering global relationships.

Breadth and depth

Several themes of interest to biochemists and molecular biologists ran across the program. These included Biotechnology and Synthetic Biology, Cell Signalling and Metabolism, Genomics, Gene Regulation and Epigenetics, Bioinformatics, Computational Biology and 'Omics, Structural Biology and Biophysics, Microbial World, Molecular Basis of Disease, Molecular Physiology and Cell, Developmental and Stem Cell Biology, and Education. An exciting aspect of the Congress were focused theme days that permitted deep dives into particular specialities.

Misty Jenkins AO giving her Plenary talk on CAR T-cell therapies for treating brain cancer.

Indigenous Perspectives in Biomolecular Science

A focus theme that proved both popular and exciting was Indigenous Perspectives in Biomolecular Science, organised by and featuring Indigenous scientists. The Congress Opening Plenary Lecture was delivered by Misty Jenkins AO (WEHI), a Gunditjmara woman and an influential contributor to First Nations affairs. Misty energised the audience with her work on the development of CAR T-cell therapies to treat brain cancer. The day featured Keynote presentations from Phillip Wilcox (University of Otago, New Zealand) on Indigenous communities and gene technologies, Kimiora Henare (University of Auckland, New Zealand) on tumour microenvironment and tumour immunology, and Michael-Shawn Fletcher, a Wiradjuri man and biogeographer (Indigenous Knowledge Institute, University of Melbourne) on climate change and One Health.

Djirri Djirri, a Wurundjeri women's dance group.

The future of RNA technology

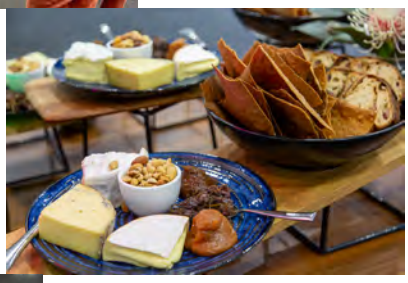
RNA Technology Day showcased the best of national and international scientific developments in the field. BioNTech Australia organised an Industry Breakfast with a panel discussion on 'Accelerating the clinical translation of local mRNA breakthroughs'. Norbert Pardi (University of Pennsylvania, USA) delivered a Plenary Talk on the design of precise optimised mRNAs for therapeutic applications, including protecting against multiple coronaviruses. Petro Terblanche (CEO, Afrigen Biologics, Cape Town, South Africa) is a global advocate for the production of medicines in Africa. She explained that Africa consumes 25% of all vaccines produced globally, but only produces 1% of its needs. Terblanche outlined a strategy to increase manufacturing capacity to 60% by 2040. Yue Wan (Genome Institute of Singapore) described new technologies to study RNA structures, whilst Ling-Ling Chen (Chinese Academy of Sciences) described circular RNA-based aptamers that can effectively suppress excessive gene activation. Traude Beilharz (Monash University) and Andrew Boslem (New England Biolabs) chaired a panel on the Future of RNA Technology with Amanda Caples (Victoria's Lead Scientist), Claire Borg (Associate Director, R&D Partnerships, Moderna Australia), Catherine Mills (Monash Bioethics Institute) and Steven Rockman (CSL Seqirus). The panel discussed new horizons in RNA technologies, the regulatory and societal constraints to progress, and how industry, government and academia can work together to realise the potential of mRNA vaccines.

Poster display in Exhibition Hall.

BMH2024 Meeting Report

Above: Grimwade Medal Reception.

A trio of musicians plays Aussie bush classics at the Welcome Mixer.



'Mad scientist' stilt walkers the Welcome Mixer.

The koala is the centre of attention at the Welcome Mixer.

Precision genome editing

Caixia Gao (Chinese Academy of Sciences) gave an astounding Plenary talk describing the development of precise and specific genome editing technologies to engineer new traits into crops. One of *Nature's* 'Ten Science Stars of China', she amazed the audience with her descriptions of 'scarless' and base-editing strategies. Her team's wheat strain that resists powdery mildew, with no loss of crop yield, has achieved registration. Alexis Komor (UC San Diego, USA), who developed the first cytosine base editor, described her multiplexed orthogonal base editors that can install multiple point mutations in target genes. Peter Fineran (Otago University, New Zealand) talked about new CRISPR-Cas-like systems that bacteria use to resist bacteriophages.

Designing biology for a healthy planet

With the world's population edging towards 9 billion people, there are major challenges around sustaining food and energy resources, and keeping people healthy, without destroying the planet. Pam Silver (Harvard University, USA) gave a Plenary talk remotely, explaining how synthetic biology can be used to design and engineer cells, tissues and organisms with enhanced function. She described her bionic leaf project to turn sunlight into liquid fuel and outlined recent projects that enabled bacteria to capture greenhouse gases and make chocolate. Seigo Shima (Marburg University, Germany) shared his findings on the enzymes involved in methane production, with a view to finding biotechnology solutions to climate change. Greg Cook (University of Otago, New Zealand) has identified microbes responsible for methane production in sheep, a discovery which could help reduce emissions from livestock. Cook described the development of small molecule inhibitors and vaccines to specifically target the production of methane by methanogens.

AI for protein design

Sergey Ovchinnikov (Massachusetts Institute of Technology, USA) gave a Plenary talk remotely that explained how artificial intelligence (AI) has been used to solve a grand challenge in biology, namely, the accurate prediction of the three dimensional structure of proteins. His group is using AI to drive new bio designs. Jennifer Listgarten (UC Berkeley, USA) reported on machine learning for protein engineering and Jane Allison (University of Auckland, New Zealand) described her work on molecular dynamics simulations to provide atomic level information about signalling processes.

Microbial world and new therapeutics

Leo Eberl (Zürich University, Switzerland) gave a Plenary talk on the use of genome-wide profiling to understand quorum sensing and bacterial pathogenicity. Kei Sato (Tokyo University, Japan) reviewed lessons learned about SARS-CoV-2 variants from the COVID-19 pandemic and how to prepare for future pandemics.

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Raghavan Varadarajan (Indian Institute of Science) described thermostable vaccine designs, including for the SARS-CoV-2 spike protein, that obviate the need for cold chain vaccine storage. Victor Nizet (UC San Diego, USA) described the production of biodegradable, biomimetic cellular nanoparticles that can be used to combat invasive bacterial infections such as those causing pneumonia and sepsis. Mike Barrett (University of Glasgow, UK) described the characterisation of *Leishmania* immunometabolites that are produced to alter macrophage function, thereby avoiding immune destruction by host cells.

Metabolic mayhem

Shobhna Kapoor (Indian Institute of Technology Bombay) described the effects of *M. tuberculosis* lipids on host macrophage membranes. Heather Christofk (UC Los Angeles, USA) explained how cancer metabolism affects tumour growth. John Chambers (NTU, Singapore) described studies of the genetic makeup of thousands of patients, and their use to identify new genetic and epigenetic pathways associated with coronary heart and metabolic diseases. Brian Glancy (NIH, USA) reported his work on muscle energetics and mitochondrial energy metabolism. Marian Walhout (University of Massachusetts, USA) described a 'worm Perturb-seq' method that combines RNAi knockdown with RNA sequencing, which she has applied to apporximately 1,000 metabolic genes, to understand how metabolism is wired in *C. elegans*. You-Me Kim (KAIST, Korea) explained that short chain fatty acids are major microbial metabolites that can reduce airway inflammation and improve lung function.

Genomics and epigenetics

Richard Roberts (New England Biolabs, USA) delivered his Path to a Nobel Prize session, chaired by Erinna Lee and Marilyn Anderson. Roberts discovered split genes and mRNA splicing, for which he received the Nobel Prize in Medicine or Physiology in 1993. He also founded New England Biolabs, one of the first commercial suppliers of restriction enzymes in the late-1970s. He explained that restriction enzymes were the key to unlocking the doors of modern genomics and molecular biology. He exhorted early career colleagues to embrace 'failed' experiments. If someone repeatedly gets an unexpected result, Roberts' observation is that "nature is trying to tell you something". His Keynote talk described new insights into DNA methylation in bacteria. Job Dekker (University of Massachusetts, USA) used 3D interaction studies to understand how cells compact their chromosomes, as they enter mitosis. Wei Xie, (Tsinghua University, China) described the epigenomic reprogramming that accompanies early embryogenesis and cell fate determination in mammalian embryogenesis. Marnie Blewitt (WEHI) described new epigenetic regulators, and explained how epigenetic silencing can be manipulated to treat disease.

Signalling, communication and cellular control

Nick Barker (A*STAR IMCB, Singapore) described the use of organoids to identify cancer stem cells that represent potential therapeutic targets. Hozumi Motohashi (Tokyo University, Japan) described supersulfides as universal bioactive metabolites that play roles in regulation of inflammation. She described a novel oxygen-sensing system that regulates lysosomal activity. Nieng Yan, (Shenzhen Medical Academy, China) used cryo-EM to study membrane transport proteins, revealing the different mechanisms that cells use to exchange material with their environment. Alexandra Newton (UC San Diego, USA) talked about protein kinase C as a signalling nexus, illuminating its role in Alzheimer's disease and as a tumour suppressor in human cancer cells.

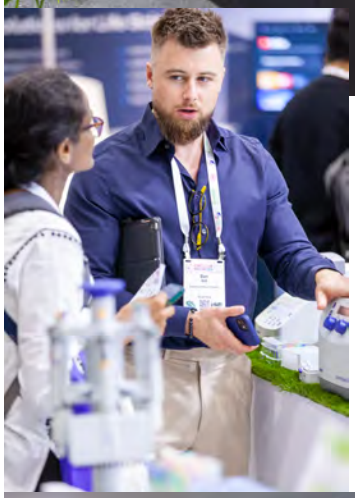
Education

Two Education sessions featured Keynote talks from Elizabeth McKinley (University of Melbourne) and Drew Berry (WEHI). A full report on Education at BMH2024 is on pages 13–15 of this report.

Abrove (from left): Ivanhoe Leung, Zahra Islam and Leann Tilley.

Networking Event at the SEA LIFE Melbourne Aquarium.

BMH2024 Meeting Report



Above: Stories & Structures: New Connections exhibition.

Left and below: Trade Exhibition.

Technical Workshops

The Congress also provided the opportunity to share technical insights through workshops on Protein Structure Prediction and Application, ANSTO Australian Synchrotron, Protein Cryo-electron Microscopy, Digital Spatial Profiling, Protein Nomenclature, the Future of Publishing, and Editor Insights.

Outreach

We welcomed high school students to our Outreach Program organised by Laura Edgington-Mitchell (University of Melbourne) and her team, working with Tony Chiovitti (Gene Technology Access Centre). Two hundred and seventy students attended a Public Lecture, with talks from Melinda Jingqi Wang (University of Melbourne) on life in science, Alexis Komor on precision genome editing and Rhys Grinter (University of Melbourne) on microbial machines. One hundred and fifty students enjoyed a guided tour of the Exhibition Hall.

Trade Exhibition and Congress catering

The extensive and vibrant exhibition Trade Exhibition was integral to the Congress, showcasing the latest innovations, products and services in the biomolecular research market. The Exhibition Hall was buzzing during the breaks between the sessions. With 69 exhibition booths, it was a valuable opportunity to connect companies with customers from across Australia and the world. The passport competition proved very popular, as were the BMH Quiz and the Factor X competitions. The MCEC Catering was superb, with thoughtful culinary options that were delicious, healthy and environmentally friendly.

Innovations

We were very pleased to incorporate an ‘art meets science’ exhibition entitled Stories & Structures: New Connections. Curated by Jenny Whiting (Microscopy Australia), the exhibition explored the rich visual parallels between Indigenous artworks and the microscopic world of nature. Another innovation was a Family Room, as well as childcare subsidies to assist delegates with carer responsibilities.

Social events

A face-to-face event is an opportunity to catch up with old friends and to make new and enduring collaborations and friendships. There was a general buzz of friendliness as colleagues practised tuakana–teina, a Maori term that refers to a teacher–student relationship based on shared mutual respect. The Monday evening Weclome Mixer was a night to remember. A koala munched on gum leaves as delegates made friends with a 2-metre python and a very tame dingo. A trio of musicians dressed as an emu, a kangaroo and a ranger roamed the room, playing Aussie bush classics. ‘Mad scientist’ stilt walkers greeted delegates as they entered the Exhibition Hall, whilst an oyster shucker added fresh molluscs to the array of excellent food.

The Wednesday evening Networking Event at the SEA LIFE Melbourne Aquarium started with a quick glimpse of Pesto the big baby penguin, before moving on to see the jellyfish, the seahorses and the 65-year-old, 6-metre long, 750 kg, male saltwater crocodile, Pinjarra. Roving canapes, food and drink stations, and lots of bubbly scientists made it a very special event.

Thank you

The Local Organising Committee worked tirelessly for six years, ever since our successful bid in Seoul in 2018, to bring the Congress together – driven by a shared passion to celebrate all things biomolecular. I would like to thank all the Presidents of the Societies and Society groupings for agreeing to come together to make this amazing meeting. There are so many things that can go wrong during the organisation of a large Congress: major bushfires, COVID, world conflicts, to name a few. We learned much more about liability insurance and

insolvent trading laws that we really wanted. But we made it. As the inspirational Indigenous Elder, Pat O'Shane, says, "Obstacles are there to get around, climb over or scramble through." I want to thank everyone for coming together to create a smoothly run and exciting meeting.

In particular, I would like to thank Executive Secretary, Erinna Lee. Her organisational skills are unparalleled. She was quite literally indispensable to the organisation process – so many letters sent, so many queries fielded, such commitment. She is amazing! I want to thank Deputy Convenors, Frances Separovic, who was always there with advice and support, and Christina Mitchell, who provided sage advice and brought so many people from Monash. I want to thank the wonderful Terry Piva who kept a firm hand at the helm of the finances and steered us to a good outcome. And Fiona Whelan and her team, for the amazing communications portfolio. I would also like to thank Paul Gleeson (FAOBMB Liaison), Debnath Ghosal (YSP), James Murphy (Fellowships and IUBMB Liaison), Nirma Samarawickrema (Education), Laura Edgington-Mitchell (Outreach), David Greening, Colby Zaph, Michelle Dunstone and Dominic Ng (Sponsorship and External Relations) and Ricky Johnstone (Research Institution Liaison). The success of the meeting was due to their amazing work. What a team!

I would like to thank all of the Program Committee members for their enormous contributions to BMH2024. Stephanie Gras, Andy Hill and Wai-Hong Tham were inspirational leaders. So many 8am meetings. So much poring over Abstracts and the dreaded Program grid! They assembled a team of more than 40 Program Committee members who put together the Streams, and then found Chairs, who found the speakers, who made it such an amazing Program. I want to thank the organisers of the Career Development Forum, Sarah Garnish, Tatiana Soares da Costa and their team, as well as Sarah Stewart, Emma Grant and their teams, for organising the posters and lightning talks.

The Victorian State Government was a very strong financial supporter of the Congress, enabling us to put together this impressive event. I would like to thank the State Government, the City of Melbourne and the Melbourne Convention Bureau. We are very grateful for financial support from the IUBMB and the FAOBMB. I would like to thank major sponsors, CSL Pty Ltd, the University of Melbourne, and the sponsors of individual sessions and events, including Moderna Australia Pty Ltd, BioPlatforms Australia, mRNA Victoria, NEB Pty Ltd, Thermofisher Pty Ltd, University of Queensland, Monash University, La Trobe Institute for Molecular Science, Olivia Newton-John Cancer Research Institute, Victorian mRNA Innovation Lab, Metabolomics Australia, BioNTech Pty Ltd, Portland Press Pty Ltd, CoE SynBio, Australia–Korea Foundation and ANSTO.

Many thanks are due to our Professional Conference Organisers, Waldron Smith Management, led by Kate Smith and her incredible team, particularly Annabel, Hannah, Charlene, Helen and Sarah. Their input went so much further than the logistical; we could not have done it without them. Kate was there with us every step of the way, holding our hands, sharing our pain and our joys, and pointing us in the right direction.

One of our early career delegates described BMH2024 as the "best conference I have ever attended". Who am I to disagree? As Evonne Goolagong Cawley said, "When you have a dream you have to work hard to achieve that dream. Your dreams can be the force that keeps you going." The BioMolecular Horizons Congress was our collective dream, and we hope it inspired delegates to continue to follow their dreams in biomolecular science.

Leann Tilley
(Bio21 Molecular Science and Biotechnology Institute, University of Melbourne)
BMH2024 Congress Convenor

Local Organising Committee: Back, from left: Fiona Whelan, Stephanie Gras, Colby Zaph, Dominic Ng, Gabby Watson, James Murphy, Tatiana Soares da Costa, Laura Edgington-Mitchell, Paul Gleeson and Nirma Samarawickrema. Front, from left: Wai-Hong Tham, Frances Separovic, Erinna Lee, Leann Tilley, Terry Piva and Andy Hill.

A Memorable Young Scientist Program in Melbourne

Welcome event at Naughtons Hotel Parkville.

We are extremely grateful to have participated in the 2024 Young Scientist Program (YSP). The event, held from 19–22 September 2024, was a remarkable opportunity for early-career researchers to exchange ideas and form lasting networks. After a very warm welcome at Naughtons Hotel in Parkville, we headed to the picturesque Cammeray Waters in the Macedon Ranges for two excellent days filled with scientific camaraderie, knowledge exchange and networking.

The 2024 YSP awardees included PhD students, postdocs and faculty members from Bangladesh, Canada, Chile, China, Germany, India, Indonesia, South Korea, Malaysia, New Zealand, the Philippines, South Africa, Switzerland, Thailand, the United Kingdom, the United States and Australia. Australia was well represented in this diverse group of 36 YSP participants, with ten fellows – Allegra Angeloni, Osvaldo Contreras, Jennilee Davidson, Katherine Davies, Alexis Diaz-Vegas, Rebecca San Gil, Yun Shi, Tao Tan, Xuan Ling Hilary Yong, Zijing Zhou.

The program featured two days of scientific sessions, during which YSP fellows gave six-minute presentations of their exciting research in a range of topics from structural biology, proteomics, molecular biology, to cancer biology, clinical genomics and more. These short presentations were divided into five sessions over two days, with tea and lunch breaks in between, providing excellent opportunities for stimulating discussions that fostered vibrant exchanges of ideas. We also had inspiring guest lectures from Professor Joon Kim (Korea University, FAOBMB President) and Distinguished Professor Alexandra Newton (UC San Diego, IUBMB President), respectively, about not only scientific research but also commercialisation efforts and career paths filled with passion. Additionally, we had the pleasure of hearing from Dr Michael Healy (University of Queensland), winner of the IUBMB Whelan Young Investigator Award, who presented his work on the Commander macromolecular complex.

Outside of the scientific sessions, participants had ample time to network in a more informal setting, including free time between 5pm and 7pm, a bushwalk, a lively trivia quiz, challenging board games, table tennis and eight-ball on a billiard table. We also had the privilege of attending a masterclass on science communication by Dr Shane Huntington, who emphasised the importance of crafting effective presentations with clear purpose and audience engagement.

Bushwalk in the Macedon Ranges.

The YSP was an inspiring and enriching event, and we are deeply thankful to the IUBMB, the FAOBMB and other societies of biochemistry and molecular biology, as well as the outstanding organising committee, Gabby Watson, Debnath Ghosal, David Teran, Rhys Grinter and Alisa Glukhova, for making it such a success.

Osvaldo Contreras (Victor Chang Cardiac Research Institute and UNSW Sydney) and Yun Shi (Griffith University)

YSP awardees and organising committee members.

Education at BMH2024

The Pre-Congress Education Workshop

Hosted by Monash University's Biomedicine Discovery Institute (Education), the Education Workshop, *Publishing high-quality higher education pedagogical research to enhance your professional visibility – tips and advice to authors,* was held the day before the Biomolecular Horizons Congress. This interactive 2-hour workshop was co-facilitated by Professor Marilee Benore (University of Michigan–Dearborn and the Editor-in-Chief of *Biochemistry and Molecular Biology Education [BAMBEd]*), Associate Professor Nirma Samarawickrema (Monash University, Education Chair of the FAOBMB) and Professor Tracey Kuit (University of Wollongong, Chair of the ASBMB Education SIG). The workshop was attended by 44 keen educators interested in publishing their pedagogical research. It focused on how to formulate a pedagogical research project; use evidence-based scholarly strategies; and develop ethically appropriate data collection instruments and analysis processes. The collaborative workshop space was buzzing with enthusiastic discussions, sharing of information and plans for future collaboration.

The workshop participants conveyed their enthusiasm via the survey:

> *"It was a great initiative to have the workshop but it felt really short and quick, more please in the future!"*
>
> *"Thanks for putting together the workshop activities and for inviting Marilee."*

In the survey, 65% of participants indicated that they were keen on becoming an author, reviewer or guest editor of the journal, while 94% planned or considered submitting manuscripts to the journal.

We thank the FAOBMB, the ASBMB Education SIG, Monash University and Wiley Publishers for generously supporting this workshop.

Education Workshop facilitators, from left: Marilee Benore, Nirma Samarawickrema and Tracey Kuit.

Education Workshop attendees.

Education Workshop in progress.

ASBMB Education SIG Committee. From left: Tracey Kuit, Matthew Clemson, Amber Willems-Jones, James Tsatsaronis, Nirma Samarawickrema, Maurizio Costabile, Alyssa Van Dreumel and Jessica Gibbons.

Education Day

The theme, *Bioscience for a sustainable future,* encompassed several sub-themes including reimaging bioscience learning, teaching and assessment; preparing graduates of the future for social licence; student voice; and bioscience jobs for the sustainable future. The Education Day brought together educators and researchers who shared innovative ways of teaching, current practices and stimulating ideas. The presentations on widely varying aspects of teaching and learning were delivered through a mix of keynotes, invited speakers, selected talks from submitted abstracts, lightning talks and posters.

Commencing the session with a Keynote talk, Dr Drew Berry (WEHI) enthralled the audience with a captivating display of magnificent animations of tissues, cells, organelles and molecules. Drew very adeptly combined cinema, science and his skills as a biomedical animator to reveal the dramatic intricacies of the electron transport chain, making this complicated process come alive. From the molecular world of biomedical animations, the second Keynote talk moved our attention to social equity issues that surround the nexus of Indigenous knowledge and STEM education. In her presentation, Professor Elizabeth McKinley (University of Melbourne) questioned what counts as knowledge, and how it can be

Education at BMH2024

known, transmitted, learned, distributed and modified in a culturally sensitive way.

Following each keynote talk was an invited presentation. The first was by Professor Marilee Benore who, as Editor-in-Chief of the IUBMB journal *BAMBEd*, emphasised the need to showcase and share best practices, innovative pedagogies, laboratory activities, our student-centred learning/teaching approaches and the pivotal role played by the journal to connect the global community of biochemistry and molecular biology educators. Her message was both powerful and encouraging! Equally encouraging for education-focused academics was Professor Merlin Crossley's (UNSW) perspective on the merits of developing a recognition scheme for education-focused academics that correlated directly to ensure career progression, recognition and respect as an educator.

> *"Teaching is a core purpose of universities. It is easier than ever to share learnings about teaching, and, with technology advancing, I find I need more help than ever to keep up. It was wonderful to get together with like-minded colleagues at the BHM2024 Education Day, to talk and hear about developments, and to share, make visible and celebrate successes."*
>
> Professor Merlin Crossley (UNSW)

Professor Crossley's attitude likely resonated with everyone. In addition, the Education Day included seven presentations from selected abstracts ranging from the use of generative AI, relationships for student success, measuring learning gains, case study teaching and building biochemical literacy, amongst others. A rich display of 24 Education posters provided further opportunities for educators to exchange ideas and network.

Education awards

An Education Award talks symposium showcased four educators that are creating innovations in biochemistry and molecular biology.

Dr Julian Pakay (La Trobe University) won this year's ASBMB SDR Scientific Education Award. He presented his work on error analysis of assessment tasks to categorise the main sources of student conceptual misunderstanding. Julian used his findings to inform curriculum development and the open educational eBook, *Foundations of Biomedical Science*.

The 2024 Michael Roberts Excellence in Teaching Award (Australian Physiological Society) was awarded to Associate Professor Puspha Sinnayah (Victoria University). Puspha demonstrated her multifaceted approach and commitment to teaching and learning, whilst embracing the challenges imposed by COVID, the rise of artificial intelligence against the ever-changing backdrop of policy frameworks.

The FAOBMB Education Special Travel Fellowship was awarded to Dr Nuruliza Roslan (Universiti Sains Islam Malaysia). Nuruliza illustrated how she integrated

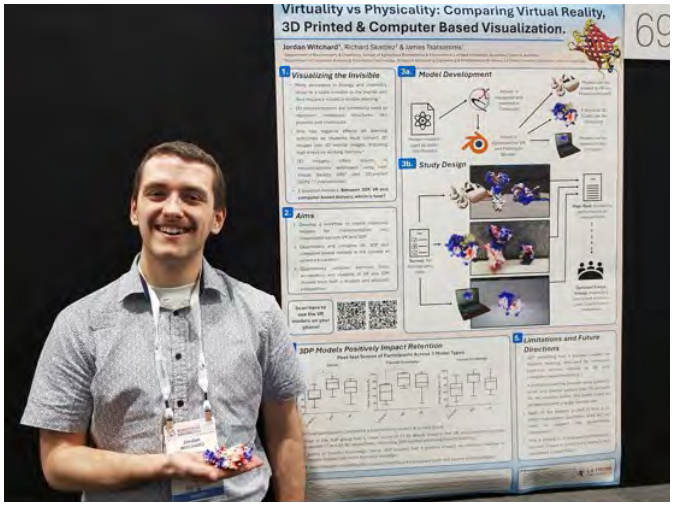
Education Keynote Session 1. From left: session co-chair, Yang Mooi Lim (Chair Education and Training Committee, Universiti Tunku Abdul Rahman, Malaysia), Drew Berry (Keynote speaker), Marilee Benore (Invited speaker) and session co-chair, Joon Kim (President FAOBMB, Korea University).

Left: Education Keynote Session 2. Keynote speaker, Elizabeth McKinley (University of Melbourne).

Education Keynote Session 2. From left: Kathryn Jones (University of Aukland), Sonja McKeown (Monash University), Reece Sophocleous (University of Wollongong), Matt Clemson (University of Sydney), Kay Colthorpe (University of Queensland), Kathy Tangilakis (Victoria University), Christian Moro (Bond University) and Tracey Kuit (University of Wollongong).

Education at BMH2024

Education Award Talks Symposium. From left: Kay Colthorpe (session co-chair), Nuruliza Roslan, Puspha Sinnayah, Tracey Kuit, Julian Pakay and Andrew Moorhouse (session co-chair).



Winner of the Education Poster, Jordan Witchard.

Educators networking beside their posters at the Welcome Mixer.

augmented reality with a mobile application platform to create interactive and visually stimulating educational tools that promote deep learning of difficult concepts.

Through a focus on student and staff relationships and sense of belonging, Tracey Kuit shared the success of her projects centred on interdisciplinarity and wicked problems using the UN Sustainable Development Goals Framework.

Jordan Witchard (La Trobe University) won the Education Poster Prize, awarded by *BAMBEd,* for his poster titled *The educational impacts of using 3D printed, virtual reality and computer-based instruction in biochemistry education*.

We thank all the participants, presenters, sponsors, supporters and the ASBMB Education SIG Committee for their contributions in making the Workshop and BMH2024 Education Day a success.

"BMB education symposia are the best forums for educationists to gather to share and learn the problems and solutions, skills and knowledge, techniques and strategies, platforms and other innovative ways of teaching BMB in different countries. The BMH2024 Education Workshop, attended by participants from the IUBMB and FAOBMB, successfully elicited different issues and concerns in BMB education. Thank you for such a stimulating day."

Professor Gracia Fe Yu
(University of the Philippines)

"The community of biochemistry educators that I met were delightful, supportive of each other, actively engaged in best practices and building a community of research and practice."

Professor Marilee Benore
(University of Michigan–Dearborn, USA)

Nirma Samarawickrema
(Monash University)
BMH2024 Education Representative
and Chair of Education, FAOBMB

BMH2024 Career Development Forum

On Sunday 22 September, we welcomed over 300 early career researchers (ECRs) from 25 countries for the BMH2024 Career Development Forum. This was a dedicated one-day workshop for ECRs to help shape the planning and development of their careers. We were joined by 15 excellent invited speakers from various countries, professions and career stages who engaged our ECRs and imparted their wisdom.

The opening session focused on the hot topic of research commercialisation. Three Australian research group heads Associate Professor Ashley Mansell (La Trobe University), Professor Stephanie Gras (La Trobe University), and Associate Professor James Vince (WEHI) each shared their experiences in commercialising their research through spin-outs/start-up companies. Collectively, we heard about how to identify and protect IP, translating fundamental research, and differences between academic and industry research.

Following a morning tea break, where attendees were encouraged to network with their fellow ECRs through a Networking Bingo game, we got into the discussion of how ECRs can strengthen their CV. In this session we were joined by Professor Dan Dries (Chapman University; Chair, IUBMB Fellowship Committee) and Professor Dario Alessi (University of Dundee; President-Elect, IUBMB), and NHMRC Early Career Fellow, Dr Georgia Atkin-Smith (WEHI). Professor Dries shared with us how to approach Fellowship applications, providing suggestions on how to assemble a reasonable budget and experimental plan. Dr Atkin-Smith provided useful tips on the types of leadership opportunities available to ECRs and how to showcase our leadership activities on our CV. To close out the session, Professor Alessi discussed the daunting task of finding the right postdoctoral position, giving our ECRs an insight to what group heads are looking for in applications, cover letters and interviews.

The final session before lunch, Strategic Publishing, was part of a workshop series running during the BMH2024 congress discussing the evolving landscape of scientific publishing. Editor-in-Chief of *Biochemical Society Transactions*, Professor James Murphy (WEHI), discussed the process of preparing rebuttals and reformatting your manuscript in accordance with revisions. In addition to providing ECRs with helpful tips on the revision process, James also shared the ways they can get involved in reviewing manuscripts, giving us insights into how to make ourselves accessible to editors. We were also privileged to have Dr Michael Funk, a Senior Editor of *Science*, join us for our strategic publishing session. With his professional insights, Michael spoke about the role of cover letters and how to identify the right journal for your manuscript. This was a fantastic session to include in the Career Development Forum, highlighting how involving ECRs in the publishing pipeline is not only beneficial for them, but for the system itself.

After lunch, we delved into the world outside academia and showcased the various career paths available to our ECRs. Dr Drew Berry (WEHI) opened this informative session with his award-winning animations and gave us insight into being a biomedical animator. The next speaker Dr Jasmine Li (FB Rice) shared her career path from a postdoctoral researcher to a trainee patent attorney. Dr Li gave our ECRs an understanding of the day-to-day responsibilities of the role and how she navigated the career change. We were rejoined by Dr Michael Funk *(Science)*, who shared his experiences as a professional editor. Michael's presentation provided insights into how being a professional editor differs from a scientific editor. He also highlighted the unfortunate lack of professional editorial roles available in Australia. The session concluded with an engaging presentation from Dr Matthias Pelzing, reflecting on his 30-year career in industry, starting as an application scientist in Germany to his current role with CSL as Senior Director of Analytical Biochemistry. It was clear from the outset that Dr Pelzing has pursued his passion for mass spectrometry throughout his career, conveying to our ECRs the value of following one's passion in their work.

From left: Ebony Monson, James Vince, Ashley Mansell, Stephanie Gras and Tatiana Soares da Costa.

Following a quick afternoon tea break, the day concluded with an academic panel session, providing ECRs the opportunity to ask group heads all their burning questions about the academic career. We were joined by Dr Alisa Glukhova (WEHI), Associate Professor Shobhna Kapoor (Indian Institute of Technology), Dr Scott Berry (University of NSW) and Associate Professor Alexis Komor (University of California San Diego). This session had superb engagement from our audience, with the panellists answering questions on topics such as work–life balance, finding your scientific niche and establishing your own group. Overall, this session highlighted that all academic

BMH2024 Career Development Forum

Career Development Forum committee, from left: Stanley Xie, Sarah Garnish, Chris Horne, Ella Johnston, Ebony Monson, Tatiana Soares da Costa, Emily Mackie, Noni Frankenberg and Pirooz Zareie.

journeys are different, and taking scientific leaps in your career, whilst scary, can be incredibly rewarding.

Overall, we had incredible engagement from the ECRs throughout the forum and wonderfully positive feedback from attendees. Judging by the number of entries we got for our Networking Bingo game, the Career Development Forum gave our BMH2024 ECRs a perfect opportunity to get to know each other prior to the beginning of the congress. We would like to thank our dedicated Career Development Forum committee, the Melbourne Convention Centre staff, catering staff, all our invited speakers, and the BMH2024 Local Organising Committee, especially Professor Leann Tilley (Convenor), for helping bring this event to life. Thank you to all our ECRs in attendance, for driving thoughtful, provoking and exciting discussion.

Tatiana Soares da Costa (University of Adelaide) and Sarah Garnish (Monash University), Chairs of the Career Development Forum

50 Years of Membership

Three ASBMB members reached 50 years of membership of the Society. Les Copeland attended BMH2024 and received his certificate from ASBMB President, Ross Hannan. Other members to reach this milestone and receive a certificate in recognition of their outstanding loyalty were Philip Kuchel and Ray Rose.

Les Copeland (left) receives a certificate of appreciation from ASBMB President, Ross Hannan.

This report, including sections written by other authors indicated herein, was published in the December 2024 issue of the *Australian Biochemist* and is reproduced with permission. Phillip Nagley provided additional text and images.