
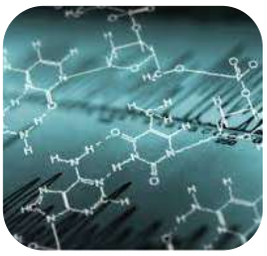


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50th World Chemistry Congress (50WCC)
14th - 19th July 2025

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CONTENTS

MESSAGE FROM THE PRESIDENT

Going into 2nd Half of 2024 – Getting ready for IUPAC 2025

For the 3rd Quarter of 2024, we have just completed ICPAC Mongolia 2024.

ICPAC Mongolia 2024
The International Congress on Pure & Applied Chemistry Mongolia (ICPAC Mongolia) 2024 was held from 28th August – 1st September 2024 at the Holiday Inn, Ulaanbaatar, Mongolia. **ICPAC Mongolia 2024** is a major international scientific meeting covering all major areas of pure and applied chemistry. The participants of **ICPAC Mongolia 2024** come from all over the world, but majority are from Japan and the rest of Asia. For **ICPAC Mongolia 2024**, we have a total of 187 delegates coming from 10 countries, namely Malaysia, Japan, Mongolia, China, Croatia, France, Germany, Lithuania, Poland and South Korea. The Scientific programmes included 3 Plenary Lectures, 6 Keynotes, 150 Invited/Oral Lectures and 3 poster presentations, making a total of 162 presentations. Overall, the Congress was a great success. A report on **ICPAC Mongolia 2024** appeared on pages 18 - 22 in this issue of the Berita.

K_3M 2024
This year we have great news for **K_3M 2024**. A record number of 40,301 participants from 957 schools took part in the Quiz which will be held on 17th October 2024 in all schools taking part.

Malam Kimia 2024
This year's Malam Kimia 2024 will be held in One World Hotel, Petaling Jaya on Friday, 6th December 2024. The Guest-of Honour will be Deputy Minister of Ministry of Science, Techmology and Innovation (MOSTI), YB Dato' Hj Mohammad Yusof Apdal. We are expecting up 700 guests for this IKM gala dinner

Our main concentration from now on is **IUPAC 2025**.

IUPAC 2025
IKM is organising **IUPAC 2025** which comprises the **53rd IUPAC General Assembly (53GA)** and **50th World Chemistry Congress (50WCC)**. **IUPAC 2025** will be held in the Kuala Lumpur Convention Centre (KLCC) from 12 – 19th July 2025 and we have started some initial work such as the establishment of the National Organising Committee (NOC) and the International Advisory Board (IAB). We have also appointed Conference Partners Sdn Bhd as the Professional Conference Organiser (PCO) and chosen Kuala Lumpur Convention Centre (KLCC) as the venue of **IUPAC 2025**.

The website, **iupac2025.org**, is already up and running. We are also working on the IUPAC General Assembly together with the IUPAC Secretariat. The scientific programmes of 50WCC are being finalised and we have invited 11 plenary lecturers and close to 100 keynote lecturers. We are also actively involved in getting sponsors and the Malaysia Convention & Exhibition Bureau (MyCEB) is a DIAMOND sponsor. Please refer to the **IUPAC 2025** website for all the information.

We are targeting 3,000 participants for **IUPAC 2025**. We need support of all Malaysians, including all IKM members, to make **IUPAC 2025** a big success.

Datuk ChM Dr Soon Ting Kueh
President, Institut Kimia Malaysia
Date: 10 September 2024

IUPAC MACRO 2024 - The 50th World Polymer Congress

Phang Sook Wai, Rusli Daik & Soon Ting Kueh

Founded in 1919, the International Union of Pure and Applied Chemistry (IUPAC) is a global federation of National Adhering Organisations dedicated to the progress of the chemical sciences. Physical and Biophysical Chemistry, Inorganic Chemistry, Organic and Biomolecular Chemistry, Polymer, Analytical Chemistry, Chemistry and the Environment Division, Chemistry and Human Health, and Chemical Nomenclature and Structure Representation are the eight main divisions that make up the International Union of Pure and Applied Chemistry (IUPAC). Among all the divisions, the Polymer Division is the most active.

Before the World Polymer Congress MACRO 2024 begins, the Polymer Division of IUPAC arranged a Division and Subcommittee Meetings based on customary culture. This would include multiple polymer scientific meetings and activities. The Polymer Division Meeting took place from June 29-30, 2024, at Aston University in Birmingham, United Kingdom (UK). A few representatives from the Division of Polymers and Materials Chemistry (DPMC) of IKM attended the Polymer Division Meeting. They were led by Prof. ChM Dr. Rusli Daik together with Prof. ChM Dr. Phang Sook Wai (observer), Associate Prof. ChM Dr. Siti Nurul Ain Md Jamil (observer) and Assistant Professor ChM Dr. Yvonne Choo Yuen Lann (SPT and SPED member of the IUPAC Polymer Division). The agenda for the first morning of the meeting included discussions about IUPAC Executive Board Matters, IUPAC Science Board Matters, Project management and application, and website administration. It was followed by photo session prior to lunch break. The afternoon meeting session concluded with the subcommittee reports. It also featured a presentation regarding conferences and education courses, as well as MACRO congresses (Macro 2024-Warwick UK, Macro 2026-Malaysia, Macro 2028-Israel, and Macro 2032-Chile). Prof. ChM Dr. Rusli Daik presented an update on the progress of MACRO 2026, which is scheduled to take place at Borneo Convention Centre Kuching (BCCK), Sarawak, Malaysia. The report presentations by the evaluation committee, CPCDS, CEDEI, CHEMRAWN, and others, kicked off the second day of meetings. Additionally, the discussion includes the Polymer Division Awards and other pertinent topics, such as keynote speakers, plenary speakers, and the educational conference honouring Prof. ChM Dr Melissa Chan Chin Han for the MACRO 2026 from July 5-9, 2026 (will be organised by IKM). At 11.30 am, the meeting was concluded with a networking lunch.

The IUPAC World Polymer Congress was held at Warwick University, United Kingdom from July 1–4, 2024. Attendees from Malaysia included the President of IKM, Datuk ChM Dr. Soon Ting Kueh, and IKM members, Prof. ChM Dr. Rusli Daik, Prof. ChM Dr. Phang Sook Wai, Asst. Prof. ChM Dr. Yvonne Choo Shuen Lann, Associate Prof. ChM Dr. Siti Nurul Ain Md. Jamil, and ChM Dr. Lee Siang Lin. This is the largest academic world polymer conference that consisted of 220 invited, keynote and plenary speakers who are well known in polymer research areas worldwide. Additionally, more than 500 speakers of research talks and 300 presenters of posters from 61 countries also participated in this conference. Prof. ChM Dr. Rusli Daik, Prof. ChM Dr. Phang Sook Wai, Asst. Prof. ChM Dr. Yvonne Choo Shuen Lann, Associate Prof. ChM Dr. Siti Nurul Ain Md. Jamil and ChM Dr. Lee Siang Lin also presented their research findings in the conference. Prof. Dr. Dave Haddleton gave the introductory remarks during the opening ceremony, which was followed by presentations by Prof. Dr. Paul Topham, Prof. Dr. Craig Hawker and Prof. Dr. Igor Lacik on the IUPAC's history, past activities, various MACRO events, and other topics. Prof. Dr. Dave Haddleton ended the opening

ceremony with a red wine toast in a lab beaker, and received fantastic response from all of the attendees.

Apart from attending the conference and showcasing their research, IKM representatives also had the opportunity to extend their networkings with members of the IUPAC Polymer Division and deliberated on possible avenues for future collaboration between the two organisations. On the third day of the conference, both sides had a brief meeting over breakfast to discuss about a few matters related to IUPAC WCC 2025 and MACRO 2026, which will be held in Malaysia. Achieving a gender-balanced research environment in the twenty-first century is a significant undertaking that calls for innovations that benefit both men and women, leaving no one behind. In order to improve speaker gender balance, IUPAC MACRO 2024 organisers implement procedures that include shortlisting women for prestigious prizes and ensuring that the genders of keynote and plenary speakers are balanced. Instead of being a conventional conference, IUPAC MACRO2024 brings together variables that promote research sharing and enjoyment. In addition to gaining knowledge and insights from research during educational workshops, plenaries, keynotes, invited talks, oral presentations, and posters, attendees can also unwind by participating in a range of on-campus and off-campus social events, local outings, sporting events, and other activities. These official and casual gatherings resemble hydrogen and covalent bonds, which may provide fantastic platforms for researchers from around the world to collaborate and produce stunning, massive macromolecules with brilliant sparks. The fact that IUPAC MACRO 2024 has achieved the sustainable development

aim is another noteworthy feature of this event. Participants can sense "the Green" of this event right away when they registered for the conference. Although the accommodations do not have air conditioning or fans, participants can still take advantage of the outside soft wind and fresh air. Furthermore, that will lower carbon footprint, decrease energy consumption and good for environment. In addition, since body and hair shampoos contain surfactants that pollute the environment, the little soap that was offered in the

bathroom is also safe for the environment. There were no mineral water bottles available during the entire event, but attendees could still easily obtain water by using paper cups or recyclable plastic cups. To reduce the amount of water wasted, participants were encouraged to fill their own drinking bottles. Additionally, participants can simply walk to the event, which can avoid the use of fossil fuel. This is made possible by the proximity between the conference venue and accommodations. Overall, attendees had a strong sense that "the Green" of this event may safeguard the environment for a cleaner and brighter future. This is essentially the event's high point, drawing in the participants.

IKM was granted a small space at the IUPAC Polymer Division booth for the four days of the conference at Warwick University in order to promote IUPAC WCC 2025 and MACRO 2026 that will be held in Malaysia. On the other hand, gala dinner was held on the 3rd July 2024 that served fine cuisine. The gala dinner was conducted in three different large halls due to the big number of attendees. Prior to the closing ceremony, Asst. Prof. ChM Dr. Yvonne Choo Shuen Lann was given an opportunity to advertise two major conferences that are held in Malaysia: IUPAC WCC 2025 and MACRO 2026. The trip to Warwick University and Aston University is incredibly beneficial for the IUPAC team as well as the IKM team.

MALAYSIAN YOUNG CHEMISTS NETWORK

INSIDE INNOVATION CENTRE IN AGRITECHNOLOGY FOR ADVANCED BIOPROCESSING (ICA), UTM PAGOH

ChM Muhammad Zulhelmi Nazri[1], ChM Khairunnisa Embi[1], ChM Nur Fashya Musa[2] & ChM Ts. Dr. Siti Nor Azlina Abd Rashid[2]

[1]Assistant Science Officer, ICA UTM Pagoh, [2]Senior Research Officer, ICA UTM Pagoh

With a coordinate of 2°9'20.40245"N, 102° 44'5.38873"E and situated near the heart of Pagoh town, the Innovation Centre of Agritechnology for Advanced Bioprocessing (ICA), UTM Kampus Pagoh officially began operation in 2017 at Pagoh Higher Education Hub (HPTP) alongside neighbouring higher education institutions such as Politeknik Tun Syed Nasir (PTSN), Universiti Tun Hussein Onn Malaysia (UTHM) and International Islamic University Malaysia (IIUM). The ICA acts as a centre of excellence to support the national aspiration and university agenda of fostering a supportive culture of research and learning especially in agritechnology and agricultural advancement.

Dedicated to finding ways to nurture students to succeed and thrive, the ICA assist students and researchers every step of the way by providing educators with perspectives on research, learning and development as well as links and initiatives for various professional development and opportunities through conducive laboratories, high-tech equipment and inculcate science of learning to encourage innovation. At the moment, the ICA focuses on the field of agriculture technology and food security with emphasis on two niche areas, precision technology and bioprocessing innovation.

To support the aforementioned research areas, ICA houses 9 research laboratories equipped for biochemistry, sample preparation, microbiology, cell culture, food analysis, soil health, tissue culture, soil testing and advanced drying laboratories. Furthermore, ICA also has a 20-acre research farm that serves as a research platform for researchers from agricultural backgrounds to explore their expertise. ICA's satellite laboratory, Halal incubator provides consultation, research and space for SMEs to earn their Halal certification from JAKIM. ICA aims to become an Agrotechnology Hub in the southern region to serve the community by transferring knowledge, skills and technology related to agriculture. The ICA is committed to pioneering research and development initiatives that harness the power of science and technology

to revolutionize the agricultural landscape in Malaysia. With a focus on three important research niches, namely precision agriculture, bioprocess innovation and agrotech hub, ICA is at the forefront of shaping the future of agriculture through cutting-edge research and transformative ideas.

Precision agriculture in Malaysia represents a paradigm shift in agricultural practices by leveraging the integration of resources, data-driven systems and automation to optimize agricultural production. Within ICA, precision agriculture research encompasses agricultural resource optimization that explores new ways to optimize soil health through innovative techniques such as soil mapping, soil sensors and precision nutrient application. Our goal is to improve soil health by promoting optimal nutrient levels, improving soil structure and minimizing erosion. As water scarcity has become a pressing global issue, our precision agriculture research includes advanced water management strategies. These include technologies such as drip irrigation, moisture sensors and water recycling systems that ensure efficient water use while maintaining crop yields and reducing water wastage. In traditional agriculture, fertilizers are often applied across the board, leading to nutrient runoff and pollution. Moreover, the ICA also use data-driven agri-nutrient systems

to maximize efficiency and minimize environmental impact, paving the way for sustainable farming practices. By driving automation and mechanization, our data-driven agri-food systems are at the forefront of innovation. The incorporation of AI and IoT to create smart farms that respond intelligently to environmental stimuli. For example, AI-powered algorithms can analyse images of crop health captured by drones or satellites, allowing farmers to detect early signs of disease or stress and take proactive action. And our work is redefining the role of technology in modern agriculture, from autonomous tractors to drone-based crop monitoring. Bioprocessing is the art and science of converting agricultural raw materials into products with high added value. The ICA focuses on agri-based functional biomaterials, optimizing processes for higher productivity, ensuring product quality through rigorous analysis and promoting sustainable biowaste management. One of our main focuses is on functional agro-based biomaterials. These are materials derived from agricultural sources such as plant fibres, biopolymers and bioactive compounds, with applications ranging from packaging materials to biomedical implants.

The Agrotech Hub at the ICA serves as a cooperation platform for industry, universities and municipalities to jointly develop innovative solutions. The hub's areas of activity include integrated farming systems, self-sustaining community and industry projects and initiatives such as the Halal Incubator Teaching Centre. Our focus is not only on technological advancements but also on self-sustaining community and industrial projects. These projects are designed to empower local communities, create economic opportunities and promote sustainable practices. The Halal Incubator Teaching Centre not only promotes the innovation of halal products but also serves as a platform for training, knowledge sharing, infrastructure and consultancy for the industry. The strength of our Agrotech Hub lies in its interdisciplinary approach, fueled by advanced research and collaboration. By bringing together experts from various fields such as agronomy, engineering, data science, and environmental sustainability, we can tackle complex challenges faced in agriculture and bioprocessing. This collaborative ethos not only fosters innovation but also ensures that our solutions are practical, impactful, and aligned with the evolving needs of the agricultural sector. Meanwhile, the ICA also pride itself on offering top-notch laboratory services to support the advancement of agrotechnology and bioprocessing with three specialized clusters namely the Chemistry Analysis Cluster, Biology Analysis Cluster, and Agriculture Analysis Cluster. Our expert teams, led by heads of clusters and laboratories equipped with state-of-the-art instruments are committed to providing precise and reliable analyses. Here's a glimpse of what the ICA can do for you:

The Chemistry Analysis Cluster offers a range of services to help you understand the chemical composition and morphology of your samples. Our high-performance liquid chromatography (HPLC) coupled with a diode-array detector (DAD), evaporative light scattering detector (ELSD), and fluorescence (FLR) detector, as well as our gas chromatography equipped with flame ionization detection (GC-FID), can identify and quantify various substances with accuracy and precision. We also conduct phytochemical analysis (total flavonoid content and total phenolic content) to explore the natural compounds present in plants. With the aid of Fourier Transform Infrared- Attenuated Total Reflection (FTIR-ATR) analysis, we can delve into the molecular structure of materials, providing valuable insights. We also provide proximity analysis to determine key parameters such as moisture, ash, protein, fat, and fibre content for nutritional value in food products. Lastly, our viscosity analysis helps us understand the flow characteristics of liquids. In the Biology Analysis Cluster, our team can conduct tests such as total plate count, yeast and mold analysis, as well as identification of nitrogen-fixing bacteria and the lactobacillus. Additionally, we specialize in assessing the presence of trichoderma and conducting antimicrobial tests. Furthermore, we provide services for selected strain purchases and can perform assays such as MTT assay for cell viability and wound healing assay to evaluate potential therapeutic effects in cell culture studies. The Agriculture Analysis Cluster specializes in analyzing fertilizers, compost, and plant physiology. Our dedicated team uses standard methods to examine the quality and effectiveness of fertilizers and compost, ensuring they provide the nutrients plants need to thrive and are suitable for enhancing soil health. Additionally, our experts delve into plant physiology, studying how plants grow, develop, and respond to their environment.

ACKNOWLEDGEMENT
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MALAYSIAN YOUNG CHEMISTS NETWORK

RECENT OCCURRENCES AND REGULATION ENFORCEMENT OF PER- AND POLYFLUORINATED SUBSTANCES IN DRINKING WATER

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Per- and polyfluorinated substances (PFAS) have emerged as significant contaminants in drinking water sources, garnering widespread attention due to their persistence, toxicity, and potential health risks. This article provides a comprehensive overview of recent occurrences of PFAS in drinking water and the regulatory measures enforced to mitigate their impact. It synthesizes current research findings, highlighting the prevalence of PFAS contamination across various regions and its implications for public health. Additionally, it examines the regulatory landscape governing PFAS, including legislative initiatives and enforcement actions aimed at monitoring and controlling these contaminants. By analysing the intersection of scientific research and regulatory efforts, this abstract offers insights into the ongoing challenges and advancements in addressing PFAS contamination in drinking water.

1.0 Introduction

Harmful PFAS are an urgent public health and environmental issue facing communities across the United States. PFAS have been manufactured and used in various industries in the United States and around the world since the 1940s, and they are still being used today (Kim et al., 2023). Due to their extensive use, PFAS can be found in surface water, groundwater, soil, and air—from remote rural areas to densely populated urban centres. A growing body of scientific evidence shows that exposure to certain PFAS at specific levels can adversely impact human health and other living organisms. Despite these concerns, PFAS are still used in a wide range of consumer products and industrial applications. Researchers at the Environmental Protection Agency and their partners across the country are working hard to answer critical questions about PFAS: how to better and more efficiently detect and measure PFAS in our air, water, soil, and fish and wildlife; how much people are exposed to PFAS; how harmful PFAS are to people and the environment; how to remove PFAS from drinking water; and how to manage and dispose of PFAS.

2.0 Per- and Polyfluorinated Substances (PFAS)

Per- and polyfluoroalkyl substances (PFAS) are a group of chemicals used to make fluoropolymer coatings and products that are resistant to heat, oil, stains, grease, and water. These coatings can be found in a variety of products. PFAS, including perfluorooctane sulfonic acid (PFOS), perfluorooctanoic acid (PFOA), perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PFHxS), hexafluoropropylene oxide-dimer acid (HFPO-DA), and perfluorobutanesulfonic acid (PFBS), are of concern because they do not break down in the environment. They can move through soils, contaminate drinking water sources, and bioaccumulate in fish and wildlife (Bodus et al., 2024). PFAS are found in rivers and lakes, and many animal species on land and in water. Detailed information regarding each type of PFAS will be discussed further.

2.1 Perfluorooctanoic acid (PFOA)

PFOA (Figure 1) is a man-made chemical primarily used in the production of fluoropolymers, which are substances with special properties such as resistance to heat, oil, stains, grease, and water. These properties make PFOA and related chemicals useful in a wide range of industrial and consumer applications, including non-stick cookware, waterproof clothing, stain-resistant fabrics, food packaging, and firefighting foams (Rehman et al., 2023). However, PFOA is also a persistent organic pollutant, meaning it resists degradation in the environment and can accumulate in living organisms over time. It has been linked to various health concerns, including cancer, thyroid disease, developmental effects, and reproductive harm. Recently, PFOA was found in the Hong Kong water supply at much higher concentrations compared to other PFAS (tap water: 39.7 ng/L; bottled water: 32.6 ng/L), followed by PFOS (tap water: 8.6 ng/L; bottled water: 7.1 ng/L). Interestingly, bottled water in Thailand contained higher levels of PFAS (especially PFOA and PFOS) compared to tap water (Wee & Aris, 2023). As a result, many countries and regulatory agencies have taken steps to restrict or phase out the use of PFOA and related chemicals.

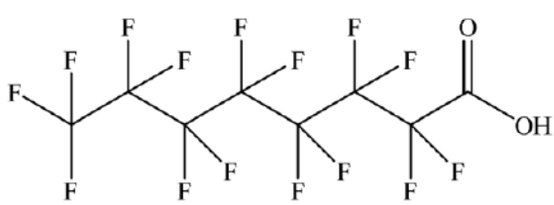

Figure 1 Chemical structure of PFOA.

2.2 Perfluorooctane sulfonic acid (PFOS)

Like PFOA, PFOS is a man-made chemical that belongs to the PFAS group. PFOS has historically been used in a variety of industrial and consumer products due to its unique properties, including its ability to repel water, oil, and stains. It has been used in firefighting foams, stain-resistant fabrics, carpets, upholstery, food packaging, and more. Like PFOA, PFOS is also a persistent organic pollutant, meaning it remains in the environment for a long time without breaking down. It can accumulate in organisms and has been found in the blood of humans and wildlife worldwide. Based on the reviews of studies conducted in Asia, China reported the highest concentration of PFOS in its groundwater samples, exceeding the US EPA recommended limit for drinking water

health advisory (Tang et al., 2023). PFOS has been associated with various health effects, including developmental delays, liver toxicity, immune system impacts, and potentially cancer. Due to these concerns, many countries have restricted or phased out the production and use of PFOS and related chemicals, and efforts are ongoing to address their presence in the environment and human exposure.

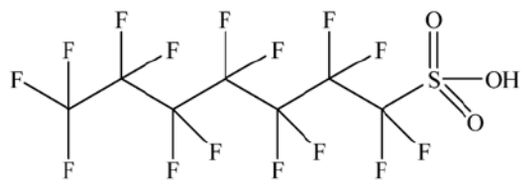

Figure 2 Chemical structure of PFOS.

2.3 Perfluorononanoic acid (PFNA)

PFNA is a type of perfluoroalkyl acid (PFAA) that belongs to the broader group of PFAS. PFNA (Figure 3) is a synthetic chemical compound consisting of a fluorinated chain with nine carbon atoms and a carboxylic acid functional group (-COOH) at one end. Like other PFAS, PFNA has been used in various industrial and commercial applications due to its unique properties, including oil and water repellence, heat resistance, and chemical stability. It has been used in products such as stain-resistant coatings, firefighting foams, lubricants, and in the production of certain polymers. However, PFNA, like many other PFAS compounds, is resistant to degradation in the environment and can persist for long periods. It has been detected in water, soil, air, and biological tissues globally. Exposure to PFNA has been associated with potentially adverse health effects, including developmental toxicity, liver toxicity, immune system effects, and potential carcinogenicity. As a result, regulatory agencies and governments have taken action to monitor and regulate PFNA and other PFAS compounds to minimize environmental contamination and human exposure.

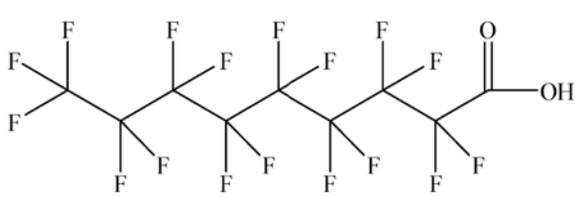

Figure 3 Chemical structure of PFNA.

2.4 Perfluorohexanesulphonic acid (PFHxS)

PFHxS (Figure 4) is a member of the PFAS family. It is a synthetic chemical compound consisting of a fluorinated carbon chain with six carbon atoms and a sulfonic acid functional group (-SO3H) at one end. Like other PFAS compounds, PFHxS is used in various industrial and consumer applications due to its unique properties, including its ability to repel water, oil, and stains. It has been used in products such as firefighting foams, surface treatments, and in the manufacture of certain polymers and textiles. PFHxS, like many other PFAS compounds, is persistent in the environment and can accumulate in organisms over time. It has been detected in water, soil, air, and biological tissues globally. Exposure to PFHxS has been associated with potentially adverse health effects, including developmental toxicity, liver toxicity, immune system effects, and potential reproductive health effects. Due to concerns about the persistence of PFHxS in the environment and its potential health effects, regulatory agencies and governments have taken action to monitor and regulate PFHxS and other PFAS compounds to minimize environmental contamination and human exposure.

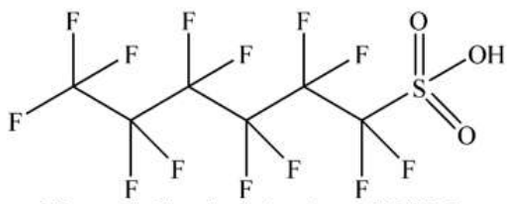

Figure 4 Chemical structure of PFHxS.

2.5 Hexafluoropropylene oxide-dimer acid (HFPO-DA) (GenX Chemicals)

HFPO-DA (Figure 5) is a chemical compound that belongs to the group of PFAS. It is also known by the trade name GenX. HFPO-DA is a synthetic compound used in industrial processes, particularly in the production of fluoropolymers. HFPO-DA is a replacement for PFOA, a PFAS compound that has been phased out or regulated due to concerns about its persistence in the environment and potential health effects. HFPO-DA was introduced as a replacement because it was thought to be less persistent and potentially less harmful. However, studies have shown that HFPO-DA and its derivatives, including perfluorohexanoic acid (PFHxA), can also persist in the environment and have been detected in water sources, soil, and even human blood serum. Concerns have been raised about the potential health effects of HFPO-DA and its derivatives, although research on these effects is still ongoing. Overall, HFPO-DA is a compound of interest due to its widespread use in industrial processes and its potential environmental and health impacts. Regulatory agencies are monitoring the presence of HFPO-DA and considering measures to minimize exposure and mitigate its effects.

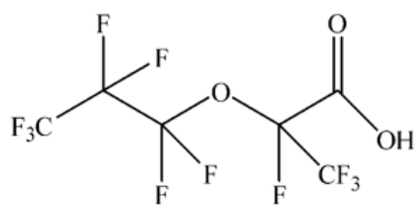

Figure 5 Chemical structure of HFPO-DA.

2.6 Perfluorobutane sulfonate (PFBS)

PFBS (Figure 6) is a type of perfluoroalkyl sulfonic acid that falls under the broader category of PFAS. It is a synthetic compound with a fluorinated carbon chain consisting of four carbon atoms and a sulfonic acid functional group (-SO3H) at one end. Like other PFAS compounds, PFBS has been used in various industrial and

consumer applications due to its unique properties, including its ability to repel water, oil, and stains. It has been used in products such as surfactants, firefighting foams, and in the production of certain polymers. PFBS, similar to other PFAS compounds, can persist in the environment for long periods without breaking down and has been detected in water, soil, air, and biological tissues globally. Exposure to PFBS has been associated with potentially adverse health effects, including developmental toxicity and impacts on liver and thyroid function, although research into the specific health effects is ongoing. Regulatory agencies and governments have monitored and regulated PFBS and other PFAS compounds to minimize environmental contamination and human exposure.

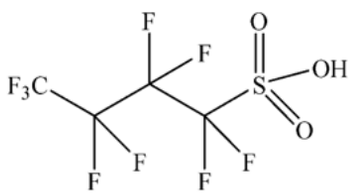

Figure 6 Chemical structure of PFBS.

3.0 Recent Regulation Enforcement Towards PFAS in Drinking Water

Under the Safe Drinking Water Act (SDWA), the Environmental Protection Agency (EPA) has the authority to establish enforceable National Primary Drinking Water Regulations (NPDWRs) for drinking water contaminants and to require monitoring of public water supplies. To date, the EPA has regulated more than 90 drinking water contaminants but has not established national drinking water regulations for PFAS. On April 10, 2024, the EPA announced the final National Primary Drinking Water Regulation (NPDWR) for six PFAS. The EPA has established enforceable Maximum Contaminant Levels (MCLs) and Maximum Contaminant Level Goals (MCLGs) for PFAS in drinking water. Below are the EPA-approved MCLs for various types of PFAS (Table 1).

4.0 The final rule requirement set by the EPA

Public water systems must monitor these PFAS and have three years to complete the initial monitoring (by 2027), followed by ongoing compliance monitoring. Additionally, water utilities must inform the public of the levels of these PFAS in their drinking water starting in 2027. Public water systems have five years (until 2029) to implement solutions to reduce these PFAS if monitoring shows that drinking water levels exceed these MCLs. After five years (2029), public water systems with PFAS levels in their drinking water that violate one or more of these MCLs must take action to reduce PFAS levels and must provide notification to the public of the violation.

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Table 1 PFAS composition according to the MCLs established by the EPA. Source: (EPA, 2024)

PFAS composition	MCLs	Final MCLG
PFOA	4.0 ppt	Zero
PFOS	4.0 ppt	Zero
PFNA, PFHxS and 'GenX Chemicals'	10.0 ppt	10 ppt
Any mixture of two or more of the following PFAS: PFNA, PFHxS, PFBS, and 'GenX Chemicals'	Hazard Index controlled < 1	Hazard Index controlled < 1

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Educational Visit to Makmal Kesihatan Awam Ipoh by IKM Perak Branch Members

On 26th July 2024, members of IKM Perak Branch had the privilege of visiting Makmal Kesihatan Awam Ipoh. This educational visit provided a valuable opportunity to explore the operations and advancements within the realm of public health laboratories.

The visit aimed:
1) To gain insights into the daily functions and procedures of a public health laboratory.
2) To discover the current analytical techniques and technologies employed in public health,
3) To build connections between IKM Perak members and laboratory professionals
4) To highlight the crucial role of public health laboratories in disease prevention and control.

The day commenced with a warm welcome from IKM Perak Chairperson ChM Dr Wong Lai Peng and an introduction to the laboratory by the director of MKAI, Dr Norita binti Shamsudin , who is also a Public Health Medicine Specialist.

Technical Presentations: The session continued with detailed presentations from MKAI. Scientific officers from each section at MKAI delivered informative talks on the role of public health laboratories in disease surveillance and outbreak management, including their involvement during the COVID-19 pandemic. Additionally, we were briefed on the role of the Food Section Laboratory at MKAI in ensuring food safety and quality. Examples of analyses conducted in the food section include residual veterinary drug analysis, mycotoxin detection, examination of food additives, and assessment of food standards in accordance with the Malaysia Food Act and regulations. This session allowed IKM members to gain knowledge on current public health issues and the laboratory's role. A Q&A session with the Scientific officer and laboratory staff provided a deeper insight into various topics of interest.

Laboratory Tour: The members were given an opportunity to visit various laboratory sections including food analysis laboratory, biochemistry laboratory, mycotoxin laboratory, and advanced nucleic acid sequencing & bioinformatics laboratory. Although no photos were permitted in the restricted areas of the laboratory, the experience of seeing these critical sections will remain a memorable part of the visit.

Closing ceremony: The visit concluded with closing remarks from ChM Dr Wong Lai Peng, presentations of tokens of appreciation and a group photo session to commemorate the event.

Key Takeaways: The visit enriched our understanding of Public Health laboratory operations and advanced techniques. It also provided an excellent platform for networking and fostered greater awareness on the vital role these laboratories play in safeguarding public health.

IKM Perak extends its gratitude to the Makmal Kesihatan Awam Ipoh for their hospitality and for sharing their expertise. This visit underscores the importance of collaborative efforts in enhancing public health and scientific knowledge.

Prepared by: ChM Dr Muhammad Nur' Hafiz Rozaini
Date: 29th July 2024

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Chemistry for Sustainable Future

Shellfish Poisoning By Biotoxins – A Need for Rapid and Early Toxic Algae Detection

Siti Aishah Hasbullah*[1], Lee Yook Heng[1], Eda Yuhana Ariffin[2] and Emma Izzati Zakariah[1]
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[2]Chemistry Section, School of Distance Education, Universiti Sains Malaysia.
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Nowadays shellfish have become expensive delicacies that loved by many. But not many consumers of shellfish realised the poisoning risk associated with consuming contaminated shellfish. The deadly shellfish contamination is related to contamination by biotoxins from harmful alga bloom (HAB) events in the marine waters. The four types of poisoning of shellfish from harmful algae contaminations are paralytic shellfish poisoning, neurotoxic shellfish poisoning, diarrheal shellfish poisoning and amnesic shellfish poisoning, which are respectively caused by the biotoxins saxitoxin, brevetoxin, okadaic acid and domoic acid. HAB has been frequently reported in the South China Sea and the Malacca Strait waters. Water samples and mussels were always contaminated with biotoxins from harmful alga such as *Prorocentrum, Alexandrium* and *Pseudonitzschia* species (Hussein 2024, My Metro, 6 June)

Recently, we were shocked by several cases of food poisoning reported in Port Dickson, Negeri Sembilan. Two people received treatment in the Intensive Care Unit (ICU), five others were admitted to the regular ward, and one patient was treated as an outpatient at the Port Dickson Hospital (Zakaria 2024, My Metro, 2 April). Negeri Sembilan State Health Department (JKNNS) revealed that the consumption of harmful mussels was the cause of food poisoning (Zulkifli 2024a, Sinar Harian, 2 April). Laboratory analysis of mussel and water samples collected from Port Dickson waterways confirmed the presence of harmful biotoxins. The Kuala Lumpur Fisheries Biosecurity Centre's lab analysis also revealed the presence of harmful algae that produce toxins, rendering the mussels in Port Dickson waters contaminated and unsafe to be consumed (Zulkifli 2024b, Sinar Harian, 23 April). This kind of tragedy could be caused by an HAB event in the marine waters (Oh et al. 2023). In the case of Port Dickson, it was found that the waters contained the harmful algae species named *Alexandrium* sp that led to elevated levels of biotoxins (Assan 2024, Sinar Harian, 12 Julai). Thus, the Negeri Sembilan Fisheries Department continued to enforce the restriction on the production and eating of mussels and shellfish in Port Dickson.

The prevalence of this deadly algae is related to a number of factors, including climate change, which affects temperature and rain patterns, high temperatures, chemical waste pollution, plastic materials, and waste from sea disposal. Changes in the physical condition, colour and smell of water can be detected when this harmful algae bloom occurs. While harmful algae die and degrade, they emit gases that smell like plants or rotting eggs. The colour of the water also changes to red, orange, yellow, brown, green and blue depending on the type of algae (Centers for Disease Control and Prevention). Currently, most techniques of monitoring and identifying harmful algae depend on microscopic counting of algae in water samples. However, this method requires taxonomic expertise as it relies on analysing morphological traits. In certain circumstances, the data obtained from this technique is insufficient for the precise identification of algae, particularly for identifying the specific species and the dynamics of this hazardous algal outbreak (Alshehri 2020). Photopigment analysis is also used, although it cannot distinguish between very similar

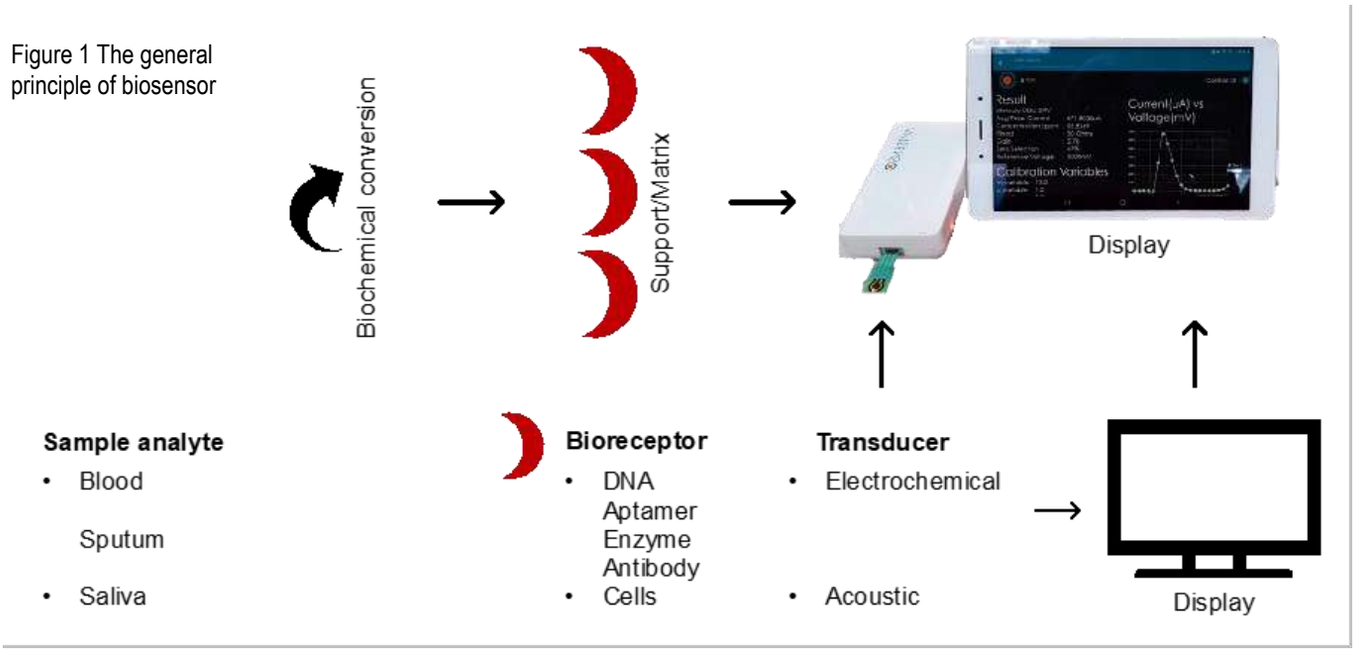

Figure 1 The general principle of biosensor

taxonomies.

Thus, several more accurate, easier and simpler analytical methods have been developed to detect harmful algae species and their biotoxins to prevent various issues arising in public health and marine resources due to exposure to the alga biotoxins. This is because the current equipment or methods to identify water-borne microorganisms, such as polymerase chain reaction (PCR) and Enzyme-Linked Immunosorbent Assay (ELISA), are generally complicated, need skilled operators, expensive, and require centralised equipment usage. Marine biology pollutions usually occur far from the test centre, and these conventional methods are less convenient (Bergkemper & Weisse 2018). Thus, effective control requires easy and low-cost on-site methods to be developed for more efficient surveillance (Kurmayer et al. 2016).

A new device that provides early detection is greatly needed as an early detection system for HAB contamination. Furthermore, the outbreaks of HAB events are often linked to mussel poisoning. An example is the blooming of harmful algae *Alexandrium minutum* (*A. minutum*), which is responsible for mussels contaminated with biotoxin. Various molecular techniques have been developed to detect and identify this species of algae (Oloketuyi et al. 2020). However, suitable diagnostic kits to increase diagnostic and detection capabilities are still under development. For the past several years, biosensor implementation has attracted many researchers to detect and monitor toxic algae (McPartlin et al. 2017). Biosensor techniques combine biochemistry recognition elements with transducer signals to identify pollutants (Chin Chwan Chuong et al. 2022).

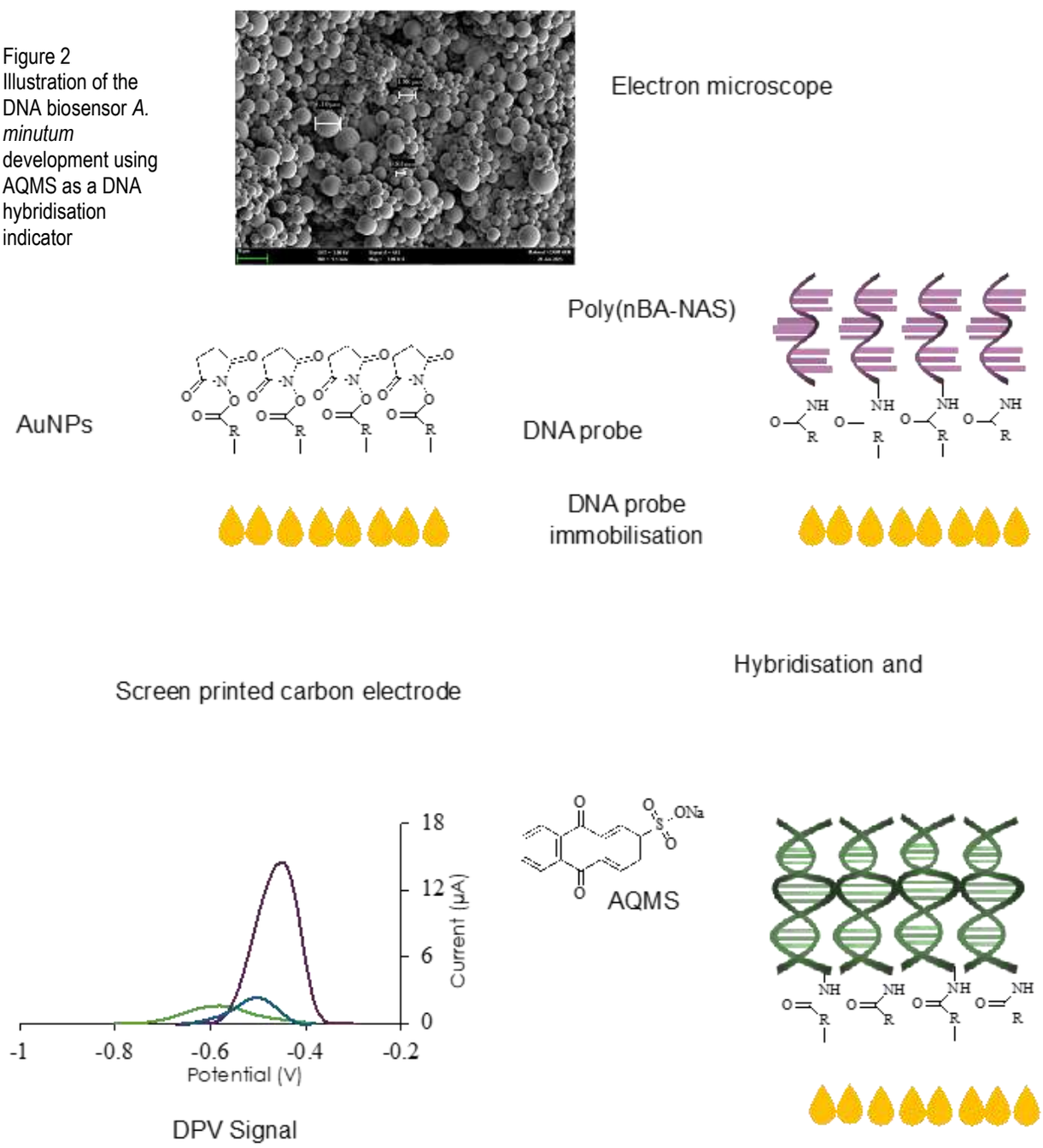

Figure 2 Illustration of the DNA biosensor *A. minutum* development using AQMS as a DNA hybridisation indicator

Recognition using a bioreceptor, which consists of either DNA probe sequence, antibody, aptamer or enzyme, has the capability to bind selectively or produce biochemical reactions with its target analyte (Naresh & Lee 2021). The product from the reaction will generate some kind of signal, which can be measured by a transducer (Figure 1). The biosensor technique could provide a solution to manage constraints faced in applying the conventional analysis methods. For instance, biosensors are easier to use, producing faster detection time and the ability to be operated on-site without the need for a centralised laboratory (Andryukov et al. 2020). These characteristics improve routine determinations by facilitating instant recognition of the presence of harmful algae at various locations. Among the biosensors that have been developed for HAB are electrochemical immunosensors. Oloketuyi et al. designed the sensor utilising glassy carbon electrodes (GCEs) modified with gold nanoparticles that are specific to detecting Alexandrium minutum (A. minutum AL9T). Electrochemical impedance spectroscopy (EIS) has been used to calculate A. minutum cells in water samples by measuring the change in the transfer resistance of electrode charges with a hexacyanoferrate indicator. The developed immunosensor provides high reproducibility and low-cost development, exhibits higher sensitivity than previously reported alternative diagnostic methods, and shows a wide linear range between 103 and 109 L−1 cells with a low detection limit for A. minutum AL9T at 3 × 103 L−1 cells. This immunosensor has also been successfully used to detect and measure A. minutum AL9T in seawater and brackish water samples, proving that it can be used for the early detection of harmful microalgae without the need for preliminary steps such as preconcentration or dialysis (Oloketuyi et al. 2020). Meanwhile, another DNA biosensor was also developed (Zakariah et al, 2024) for the determination of the toxic microalgae A. minutum. This biosensor detected the gene sequence of A. minutum via an electrochemical method. DNA hybridisation due to the presence of A. minutum was indicated by anthraquinone-2-sulfonic acid (AQMS) as the redox indicator (Figure 2). Studies using UV-Vis spectroscopy and molecular docking showed that AQMS binds well to the double-stranded DNA. Also, the developed biosensor can detect A. minutum DNA at very low concentrations, ranging from 1 × 10−13 M to 1 × 10−6 M, with detection as low as 6.91 × 10−14 M. It can also distinguish between A. minutum DNA targets and non-target DNA, The biosensor can be reused twice. These biosensors have also shown that they can effectively detect toxic microalgae in their early stages. In addition, they have been proven successfully in detecting A. minutum in water samples taken from a river in Tumpat, Kelantan, where the results were comparable to standard molecular procedures such as PCR (Zakariah et al. 2024).

To summarise, contamination of shellfish attributed to HAB events in Malaysian waters could be a serious matter that affects not only public health but also the aquaculture industries. Considering the rapid changes in environmental conditions due to various forms of pollution, including climate change, on-site detection of harmful algae employing biosensor technologies will be able to provide support to the relevant authorities to give early warning on potentially dangerous HAB occurrences. This may allow fast actions to be taken to prevent future incidents of shellfish poisoning by harmful algae blooms.

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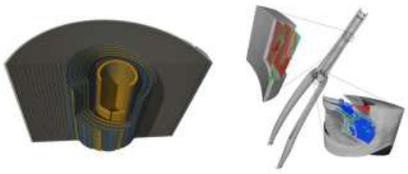

Lithium ion battery, showing section of overview scan and VOIS inset at higher resolution. Field of view: 18 mm

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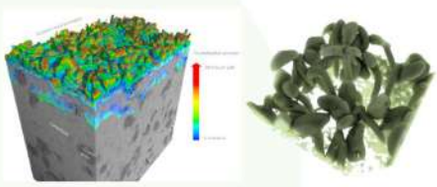

3D render of 138 scans of a crystallizing gypsum crust on a sandy limestone. Color corresponds to the time evolution of the gypsum formation and sub-surface microporous layers.

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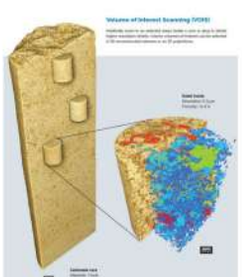

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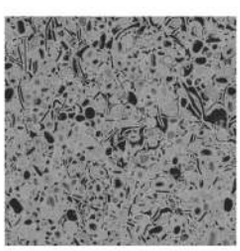

Reconstructed slice through oolithic limestone (voxel size: 3.4 µm).

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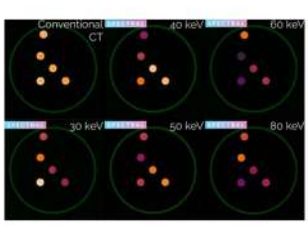

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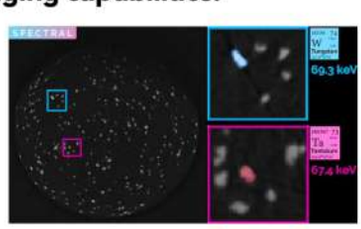

Absolute identification of Ta and W in an ore mineral sample using K-edge localization. Even edges close together can be separated.

International Congress on Pure & Applied Chemistry (ICPAC) Mongolia 2024

28th August - 1st September 2024

Institut Kimia Malaysia (IKM) successfully organized the ICPAC Mongolia 2024 at the Holiday Inn Ulaanbaatar, Mongolia from 28th August - 1st September 2024. ICPAC Mongolia 2024 is a major international scientific meeting covering all major areas of pure and applied chemistry. ICPAC was first held in 2016 in Kuching, Sarawak, Malaysia and ever since, it is being held annually in countries like Vietnam, Cambodia, Malaysia, Myanmar and Indonesia. ICPAC Mongolia 2024 is the eight of a series of major international scientific meeting covering all areas of pure and applied chemistry including specific themed symposia.

The participants of ICPAC Mongolia 2024 come from all over the world, but majority are from Asia. For ICPAC Mongolia 2024, we have a total of 187 delegates coming from 10 countries. The Scientific programmes include 3 Plenary Lectures, 6 Keynotes, 150 Invited/Oral Lectures and 3 poster presentations, making a total of 162 presentations.

IKM would like to record sincere appreciation to the Joint Organizers, namely the Mongolian Chemical Society and Asia Chem Corporation, Japan for collaborating in jointly organizing ICPAC Mongolia 2024. The theme 'Promoting Excellence in Chemical Research and Innovation' focused on advancing chemistry for meeting the UN Sustainable Development Goals 2030.

ICPAC Mongolia 2024 comprised the following General Session and Symposia:

- ICPAC Mongolia 2024 General Session (IGS)
- Symposium on Organic and Biomolecular Chemistry (OBC)
- Symposium on Inorganic and Coordination Chemistry (ICC)
- Symposium on Physical Chemistry and Catalysis (PCC)
- Symposium on Analytical and Environmental Chemistry & Engineering (AEC)
- Symposium on Polymer and Materials Chemistry (PMC)
- Symposium on Analytical Chemistry (ANC)

The main objective of ICPAC Mongolia 2024 is to promote the advancement of chemical sciences in the Asia Pacific region. The congress also leads to collaboration in research and networking among scientists from this part of the world. In parallel with rapid economic development in this part of the world, we hope that this region will also see significant scientific advancement that will give support to the socio-economic transformation and elevate the level of science, technology and innovation to be on par with the best in the world.

OFFICIAL OPENING CEREMONY

Professor Dr Avid Budeebazar, President of the Mongolian Chemical Society & Co-Chairman, ICPAC Mongolia 2024, welcomed the delegates to Ulaanbaatar, Mongolia during the Opening Ceremony on Tuesday, 28 August. This was followed by an address by Dr Battogtokh Dorjgotov from the Department of Science Policy, Ministry of Economy and Development of Mongolia. The Congress was officially opened by Datuk ChM Dr Soon Ting Kueh.


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ICPAC MONGOLIA 2024 TECHNICAL PROGRAMME
PLENARY SESSIONS

Plenary Lecture 1

How to Experimentally Obtain Microscopic Information on Electrochemical Interfaces?

Yasuyuki Yokota, *Institute of Physical and Chemical Research, Japan*

Plenary Lecture 2

Sustainable Oxovanadium(V)-Catalyzed Synthesis of Ureas Using Carbon Dioxide under Atmospheric Pressure

Toshiyuki Moriuchi, *Osaka Metropolitan University, Japan*

Plenary Lecture 3

Material Reservoir AI Computing Device Made of Nanomaterials

Hirofumi Tanaka, *Kyushu Institute of Technology, Japan*

ICPAC Mongolia Welcome Reception

The welcome reception for the delegates were held at the Holiday Inn, Ulaanbaatar. The delegates got a feel of Mongolian food delicacies.

ICPAC Mongolia Banquet

The Congress Banquet held on Saturday, 31 August, was a grand occasion. About 140 delegates attended the Banquet. The event started with singing of Negaraku in conjunction of Malaysia's 67th independence day celebration.

Datuk ChM Dr Soon Ting Kueh gave the Welcome Address to invite all delegates to sample the local dishes and enjoy the entertainment provided. The Mongolian Chemical Society presented 5 cultural shows during the banquet.

- Traditional Folk Long Song " Uyakhan Zambuu Tiviin Naran" by Uuganbat.
- Horse head fiddle with two strings "Wonder of Morin khuur" by fiddler Altanbat.
- Mongolian Traditional dance " Bii biyelgee" by dancer Enkhburen.
- Contortion art by contortionist Namuun.
- Throat singing "Praise of Chinggis Khan" and "Praise of 33 Gobi" by singer Lhamragchaa.

All in all, it was a fun filled evening.

Congress Tours

IKM organized a tour to Chingisiin Khuree for the delegates on 30 August. The delegates were entertained with traditional folk followed by Mongolian wrestling, Mongolian Traditional dance, horse riding and archery. All in all, the delegates enjoyed the excursion tour very much.

Conclusion and Appreciation

ICPAC Mongolia 2024 was a successful and memorable event. On behalf of the Organizers, IKM would like to record our sincere appreciation to the Mongolian Chemical Society and Asia Chem Corporation, Japan for the support and collaboration in making ICPAC Mongolia 2024 a great success. We would also like to thank all ICPAC Mongolia 2024 Plenary and Keynote Speakers, all Invited, Oral and Poster Presenters, and all Session Chairpersons for contributing to the success of ICPAC Mongolia 2024. To all Members of ICPAC Mongolia 2024 Organizing Committee and all those who have contributed in one way or another in making ICPAC Mongolia 2024 a success, we would like to record our utmost appreciation.

Report by:
Datuk ChM Dr Soon Ting Kueh
Chairman, ICPAC Mongolia 2024
5 September 2024

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EMAIL: ikmhq@ikm.org.my **WEBSITE**: http://www.ikm.org.my **FACEBOOK**: Institut Kimia Malaysia

President: Datuk ChM Dr. Soon Ting Kueh

MALAM KIMIA 2024
Friday, 6 December 2024

Malam Kimia 2024 will be held on **Friday, 6 December 2024** at the **Citrine & Ruby Ballroom (Level G), One World Hotel, Bandar Utama, 47800 Petaling Jaya, Selangor.** Presentation of the IKM Annual Chemistry Awards such as the IKM Gold Medal, Graduate Chemistry Medals, Merit Awards and Laboratory Excellence Awards will be made during the function. The charges for dinner are **RM250.00** per person for IKM members and their spouses only and **RM300.00** per person for non-members. Companies are welcomed to book a table for **RM3000.00**.

The closing date for purchase of dinner tickets is **10 November 2024**.

REPLY SLIP

Executive Director
Institut Kimia Malaysia
127B, Jalan Aminuddin Baki
Taman Tun Dr. Ismail
60000 Kuala Lumpur

Date……

MALAM KIMIA 2024

1. I wish to purchase the following dinner tickets (Fill in the number of tickets in box):

Member / spouse ☐ at RM250.00 each

Guests (non-members) / Organization ☐ at RM3000.00 for 10 pax

Guest (non-member) ☐ at RM300.00 each

2. I attach payment proof of RM …….. for the dinner ticket(s).

Signature: ……..

Name: ……... IKM Membership Number:……

Address: ……

……

Mobile Phone Number: …… Email: ……

Mode of Payment (direct online transfer / walk-in / cheque / ATM transfer)
Name of Account: INSTITUT KIMIA MALAYSIA Name of Bank: PUBLIC BANK BERHAD
Account Number: 3127 731017 Cheque should be made payable to "INSTITUT KIMIA MALAYSIA"

R.S.V.P. by fax or email before 10 November 2024 **Fax: 03-77289909 or Email: siti@ikm.org.my**

INSTITUT KIMIA MALAYSIA

MALAYSIAN INSTITUTE OF CHEMISTRY
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127B, JALAN AMINUDDIN BAKI, TAMAN TUN DR ISMAIL, 60000 KUALA LUMPUR
TEL: 603-7728 3272 **FAX**: 603-7728 9909
EMAIL: ikmhq@ikm.org.my **WEBSITE**: http://www.ikm.org.my **FACEBOOK**: Institut Kimia Malaysia

President: Datuk ChM Dr. Soon Ting Kueh

To: **All Senior IKM Members,**

Dear Senior IKM Members,

Senior IKM Members Get-together & Malam Kimia 2024 on Friday, 6 December 2024, Citrine & Ruby Ballroom (Level G), One World Hotel, Bandar Utama, 47800 Petaling Jaya, Selangor

IKM Council has decided to invite all **Senior IKM Members (age 60 years and above with at least 10 years of membership)** to attend the Malam Kimia 2024 to be held on **Friday, 6 December 2024** at the **Citrine & Ruby Ballroom (Level G), One World Hotel, Bandar Utama, 47800 Petaling Jaya, Selangor**. We are very pleased to extend a complimentary invitation personally to you and hope that you will be able to attend. If you would like to bring your spouse or family members, additional dinner tickets can be purchased from IKM Secretariat. We look forward to your attendance at this function.

ChM Dr Aqeel Saravanan
Executive Director

REPLY SLIP

Executive Director
Institut Kimia Malaysia
127B Jalan Aminuddin Baki
Taman Tun Dr Ismail, 60000 Kuala Lumpur

Date: .....

MALAM KIMIA 2024

1. I will attend Malam Kimia 2024. ☐

2. I wish to purchase additional dinner tickets as follows: (Fill in the number of tickets in box):
   - Member / spouse ☐ at RM250.00 each
   - Guests (non-members) / Organization ☐ at RM3000.00 for 10 pax
   - Guest (non-member) ☐ at RM300.00 each

3. I attach payment proof of RM ..... for the dinner ticket(s).

Signature: .....

Name: ..... IKM Membership Number:.....

Address:.....

.....

Mobile Phone Number: ..... Email: .....

Mode of Payment (direct online transfer / walk-in / cheque / ATM transfer)
Name of Account: INSTITUT KIMIA MALAYSIA Name of Bank: PUBLIC BANK BERHAD
Account Number: 3127 731017 Cheque should be made payable to "INSTITUT KIMIA MALAYSIA"

R.S.V.P. by fax or email before 10 November 2024 **Fax: 03-77289909 or Email: siti@ikm.org.my**

Thermo Fisher Scientific Introduces Innovative Mass Spectrometer to Advance Clinical Research

Thermo Fisher Scientific, the world leader in serving science, has unveiled the Thermo Scientific™ Stellar™ mass spectrometer (MS). This new solution combines fast throughput, high sensitivity, and ease of use to allow researchers to advance their translational omics research and make breakthrough discoveries more efficiently.

The Stellar MS powers translational research, the conversion of basic science discoveries into clinical applications with the ultimate goal of improving human health, as it streamlines the verification of proteins and metabolites of clinical interest. Complementing the Thermo Scientific™ Orbitrap™ Astral™ MS, Stellar MS completes a key piece of the translational research workflow. The Orbitrap Astral MS is ideal for discovering new biomarkers and the Stellar MS connects these discoveries to clinical research, providing verification of all biomarkers that matter, including peptides, metabolites, and lipids.

Compared to traditional technologies, Stellar MS achieves 10X the quantitative sensitivity while analyzing five times more compounds for proteomics, metabolomics, and lipidomics. Researchers can now achieve quantitative productivity and gain insights on a broader range of compounds which were previously impossible.

Thermo Scientific™ Stellar™ mass spectrometer

Thermo Fisher Scientific Unveils New Solutions Supporting Research Workflows

To help accelerate the promise of precision medicine, Thermo Fisher Scientific has unveiled new solutions, including new mass spectrometry and chromatography instruments and software solutions. These new solutions enable customers to unlock deeper analytical insights with built-for-purpose flexibility, improving productivity, efficiency, and accelerating translational research workflows.

These built-for-purpose solutions are signed for their unique application areas that help laboratory professionals take key findings from compounds to clinical research. Pairing Thermo Fisher Scientific's industry-leading instruments with best-in-class software solutions and workflows helps deliver on this promise, empowering key research findings of today to translate into the precision medicines of tomorrow.

Accelerating Research from Discovery to Validation

- The new Thermo Scientific™ Stellar™ MS to complement the power that the Thermo Scientific™ Orbitrap™ Astral™ MS brings to scientific discovery.
- The new Thermo Scientific™ Vanquish™ Neo ultra-high performance liquid chromatography (UHPLC) system Tandem Direct Injection workflow to help proteomics labs rapidly generate high-quality, biologically relevant data. The Tandem Direct Injection workflow enables high-throughput LC separation as a perfect companion to high-throughput mass spectrometers such as Orbitrap Astral MS or Stellar MS.

The Next-Generation Workflow Starts with Built-for-Purpose Technology

- To help accelerate research, there are three new built-for-purpose editions of the Thermo Scientific™ Orbitrap™ Ascend Editions Tribrid™ mass spectrometers with unique capabilities tailored to specific application areas.
- The three new editions include the MultiOmics Edition, Structural Biology Edition, and BioPharma Edition, featuring new hardware for a Native MS option and a dry pump with improved sustainability and performance.

Establishing a Holistic, Reliable & Secure Software Ecosystem

- The Thermo Scientific™ Ardia™ platform has improved support for the Orbitrap Astral MS and Stellar MS.
- The newly connected Compound Discoverer 3.4 software and support for third party Skyline.ms software, along with updates to Ardia Core 1.1 SW, Proteome Discoverer 3.2 software, and Ardia Platform Data Sync tool 1.1 software, bring enterprise-level data handling capabilities that enable users to manage, process, and share data in ways not previously possible.

Knowledge Sharing

Thermo Fisher Scientific invites scientists, researchers, chemists, and other laboratory professionals in Malaysia to connect, learn and exchange knowledge with experts worldwide in our virtual learning sessions.

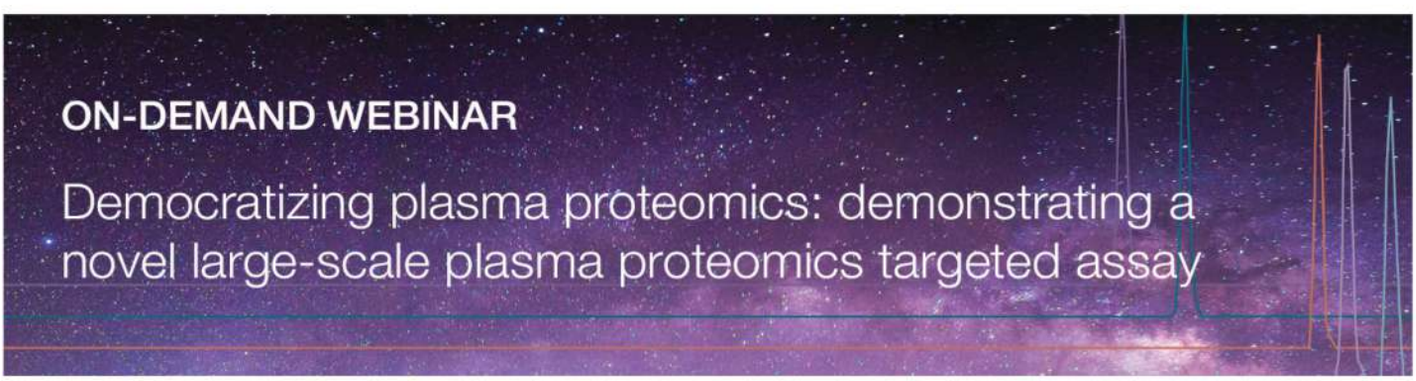
Democratizing Plasma Proteomics: Demonstrating A Novel Large-Scale Plasma Proteomics Targeted Assay

Plasma serves as a valuable source of protein biomarkers that can provide insights into disease biology. However, identifying these biomarkers in plasma proteomics presents challenges due to the wide range of protein concentrations. The Thermo Scientific™ Orbitrap™ Astral™ mass spectrometer sets a new standard for plasma proteomics, offering deep proteome coverage, fast throughput, and accurate and precise quantitation. By utilizing a newly developed extracellular vesicle enrichment protocol and Data-Independent Acquisition (DIA), remarkable depths of plasma proteome coverage have been achieved, enabling the quantification of over 5000 proteins in just 60 minutes.

While mass spectrometry is commonly seen as an unbiased discovery platform for protein quantitation, many researchers use this technology for directed monitoring of specific targets. Targeted methods, such as Parallel Reaction Monitoring (PRM), have proven to be superior in terms of precision, accuracy, reproducibility, dynamic range, and specificity.

In this on-demand webcast, the development of PRM assays will be discussed, as well as their effectiveness in measuring over 700 proteins using more than 1500 peptides in plasma. This will be done with the new Thermo Scientific™ Stellar™ mass spectrometer. Additionally, the statistical power of this approach will be highlighted by demonstrating quantitative differences in a pilot Alzheimer's disease cohort compared to DIA.

Register for this on-demand webcast here:



Expert Roundtable: Why Is PFAS Testing So Challenging?

In this exclusive on-demand roundtable discussion, experienced industry leaders in the PFAS analytical testing field shared their own experiences and explored various topics that will help empower PFAS analytical testing laboratories to future-proof themselves in this constantly evolving area of environmental concern.

Topics covered include:

- The current landscape, market trends and future state of PFAS analysis
- Review of current and emerging regulatory requirements for PFAS analytical testing
- Analytical technologies to help tackle PFAS testing projects of any size or scope, faster

Benefits and learning outcomes:

- Learn about current and anticipated challenges of routine PFAS analysis and tips for how to overcome them
- Understand the impact of ever-changing regulatory demands and why it is essential for testing laboratories to future-proof themselves
- Discover new, cutting-edge techniques for PFAS analysis that can impact overall laboratory productivity and efficiency
- Q&A with technology thought leaders on key issues faced by scientists in this field

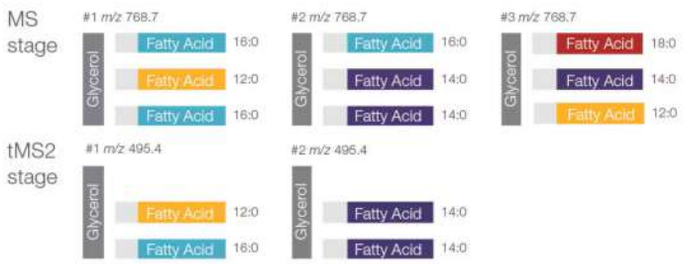
Register for this on-demand roundtable here:

Leverage Fast tMS3 Acquisition For Quantitation Of Challenging Lipid Biomarkers

Triacylglycerides (TAG), critical lipid classes involved in metabolism, are quantified for health assessment. Isomeric TAGs often co-elute using standard chromatographic separation methods requiring MS^3 fragmentation to introduce the specificity needed to quantify each isomer.

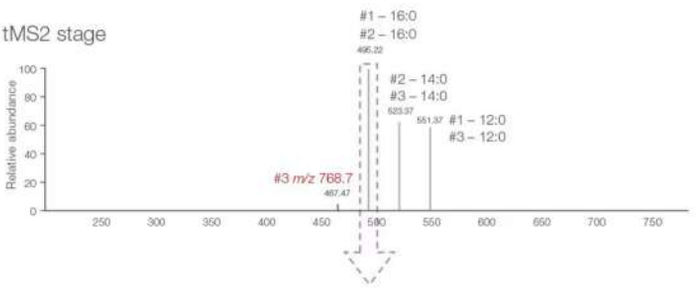
The Stellar Mass Spectrometer acquires fast tMS2 and tMS3 data up to 140 and 40 Hz, respectively, enabling qualitative and quantitative TAG analysis in one experiment.

Existing QQQ technology

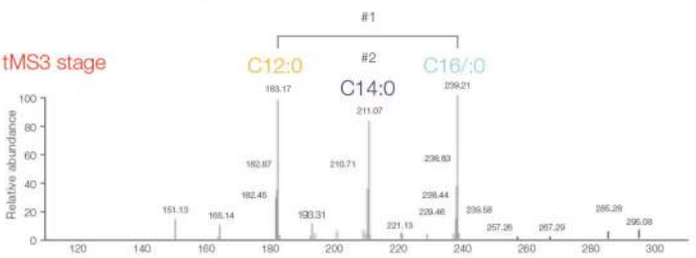


Stellar mass spectrometer

Existing QQQ technology



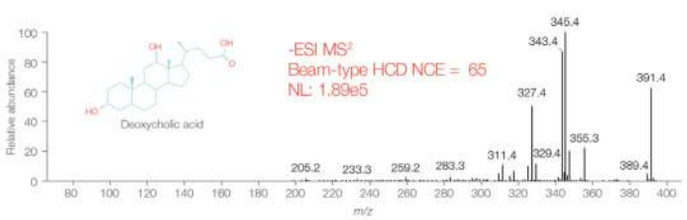
Stellar mass spectrometer

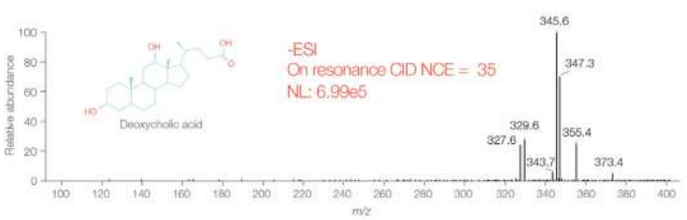


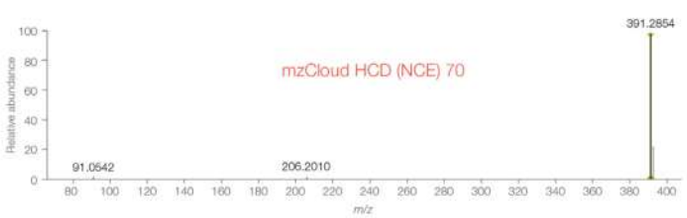
Platform Versatility Expedites Method Creation For Bile Acid Analysis

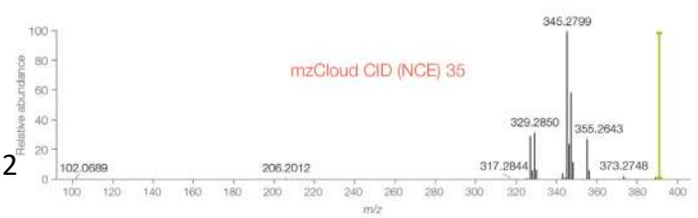
Method optimization for small molecules often requires determination of critical tandem MS parameters per analyte to achieve sensitive and specific data acquisition. This is time consuming and can be limited by one type of dissociation mechanism.

The Stellar Mass Spectrometer's fast polarity switching and MS^n acquisition speed enables comprehensive analyte characterization in one or two LC-MS^n experiments, instead of hours or days. Acquiring beam-type HCD as well as on-resonance CID fragmentation can generate alternative quantitative strategies, bypassing the need to use a less-specific SIM quantitation. Validated tandem MS spectra can also be imported from the Thermo Scientific mzCloud Mass Spectral Library for confirmation.









Technology Spotlight

In this section, we understand from Thermo Fisher Scientific why clinical and translational researchers needed a verification-class mass spectrometer to advance their research.

A Stellar Way To Overcome Barriers For Discovery Verification

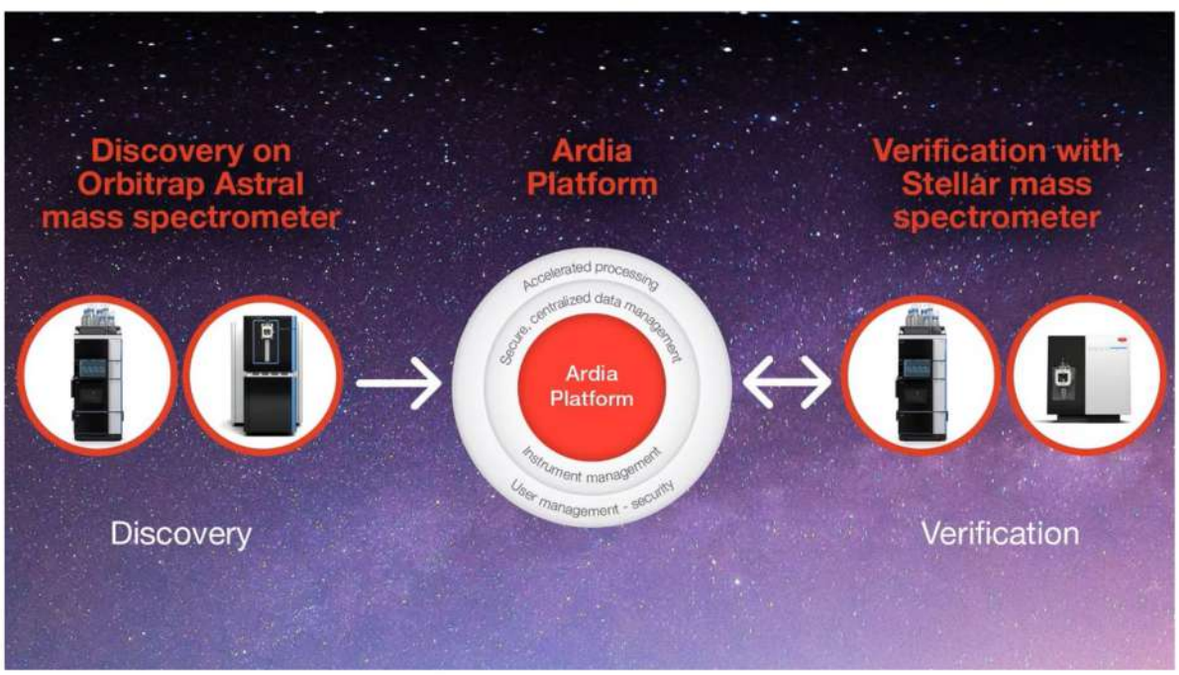
"If you were a handyman, you wouldn't dream of using a wrench as a hammer, or a screwdriver as a chisel. You always need the right tool for the job," according to Scott Peterman, Ph.D., Senior Product Marketing Manager for Life Science Mass Spectrometry of the Chromatography and Mass Spectrometry Division of Thermo Fisher Scientific.

He explains that such logic is true for clinical and translational researchers, too, who depend on having the right solution to maximize their productivity while advancing their research.

In an article available at Analyte Guru, Thermo Fisher Scientific's educational resource for biopharma, pharma, environmental, food and agriculture, industrial, and clinical laboratory professionals, Dr. Peterman discusses the challenges faced by clinical and translational researchers.

His article covers the following:

- The challenge: A missing tool in the discovery-to-validation workflow. This challenge is a decades-long issue facing clinical and translational researchers who have struggled with biomarker verification workflows due to a technology gap.
- The breakthrough solution: The first-of-its kind verification-class mass spectrometer, the Thermo Scientific™ Stellar™ mass spectrometer, expertly addresses the shortcomings of both ends of the existing verification-based mass spectrometer spectrum.
- Bridging the gap between discovery and clinical validation. After discovery, the Stellar MS becomes invaluable for the verification phase — using quantitative accuracy to narrow the broad list of candidates with the highest potential down to the best set of markers to move into clinical validation.



Read the full article at **https://www.thermofisher.com/blog/analyteguru/why-you-need-a-verification-class-mass-spectrometer/**

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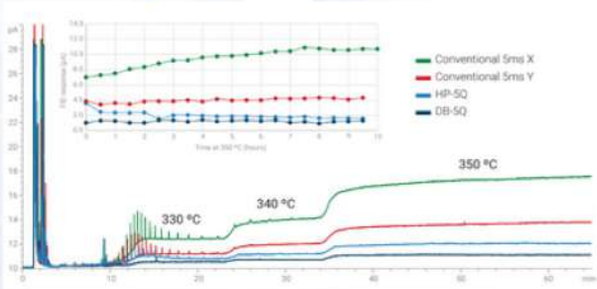
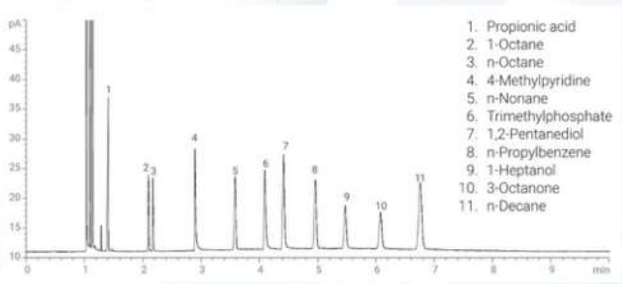
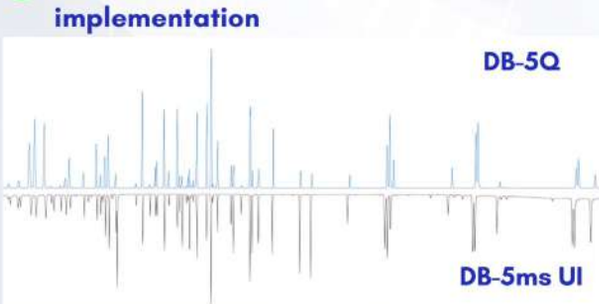
Ultra low-bleed performance simplifies mass spectral identification



Ultra inert performance lets you confidently quantify low-level, active compounds



Matching selectivity enables seamless implementation



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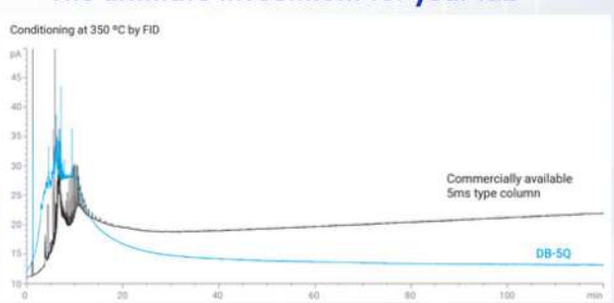

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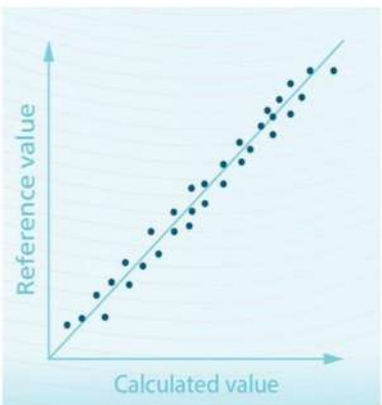
Metrohm Process solution and OMNIS NIR are based on the same technology, which simplifies data transfer.



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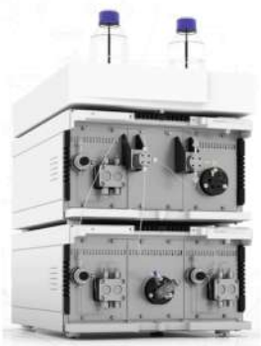
IJM NanoScaler Pro
Designed for lipid nanoparticle R&D

Allowing scientists to screen for optimal process parameters for the formulation of API-containing lipid nanoparticles (LNP).



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Karnival Kimia Malaysia (K_2M) Ke-5, Peringkat Negeri Perak 2024 & 10th Professor Goh Lai Yoong Challenge Trophy Perak Inter-School Sixth Form Chemistry Quiz

The 'Karnival Kimia Malaysia (K2M) Ke-5, Peringkat Negeri Perak 2024' and 10th Professor Goh Lai Yoong Challenge Trophy Perak Inter-School Sixth Form Chemistry Quiz, organized by Institut Kimia Malaysia (IKM) Perak Branch in collaboration with Universiti Kuala Lumpur Royal College of Medicine Perak (UniKL RCMP) and Jabatan Pendidikan Negeri (JPN) Perak was held on Saturday, August 24, 2024 at UniKL RCMP. The day-long event was officiated by the Vice President of IKM, ChM Dr. Yang Farina Abdul Aziz.

Present at the ceremony were the Chairman of K2M Ke-5, ChM Dr. Mazlin Mohideen who is also representating the CEO of UniKL RCMP, Tuan Hj. Hishamuddin Omar, Chairperson of IKM Perak Branch, Asst. Prof. ChM Dr. Wong Lai Peng, Dr. Haslan Nor Zaman representing the Director of Perak State Education Department, the Director of Center for Stem Enhancement & TVET (CSET) UniKL Chancellery, Ts. Dr. Muzafar Zulkifli and Prof. Dr. Ahmad Fuad Shamsuddin, Dean of the Faculty of Pharmacy and Health Sciences, UniKL RCMP.

The theme for K2M Perak for 2024 is "Innovation Unleashed: Empowering the Future Technologies Through Chemistry', reflecting our commitment to fostering creativity and technological advancement. The main objective of K2M Ke-5 & 10th Professor Goh Lai Yoong Challenge Trophy Perak Inter-School Sixth Form Chemistry Quiz was to raise awareness of the importance of chemistry among secondary and pre-university school students. It also aimed to stimulate interest in the subject and increase knowledge by allowing them to talk about chemistry and put their skills into practice in a friendly competition. About 250 students and teachers from a total of 30 government and private schools from Perak took part in the event.

The main highlights of the carnival were the Innovation Competition, the 3-Minutes Pitching Competition, and the Professor Goh Lai Yoong Inter-School Sixth Form Chemistry Quiz Competition. The Professor Goh Lai Yoong Inter-School Sixth Form Chemistry Quiz takes place every two years and was launched in 2002. The idea for this inter-school quiz came from the former Chairman of IKM Perak Branch, ChM Hwang Chin Hor. He came up with the idea when Professor Goh Lai Yoong generously donated money from her IKM Gold Medal (2001) to the IKM Perak Branch along with her contribution.

SMJK Sam Tet won first place in the Inter-School Chemistry Quiz Competition and walked away with the 10th Professor Goh Lai Yoong Challenge Trophy together with a plaque, certificate, and RM200 cash prize. Second place went to Kolej Yayasan UEM. The winners including their teacher received a plaque, a certificate, and RM150 cash prize, while SMK St. Michael took third place. The winners and the teacher from SMK St. Michael received a plaque, a certificate, and RM100 cash prize.

The second category is 3-Minutes Pitching, a competition aimed exclusively at STEM teachers. In this category, Nor Fakhara Dorahim @ Abdul Rahim from SMK Kampung Bahagia won first place and was awarded a plaque, certificate, and RM200 cash prize. Second place went to Ahmad Sani Ruhaizan Sahbudin from SBP Integrasi Gopeng who received a plaque, certificate, and RM150 cash prize, while Nurul Izani Kairi from Kolej Yayasan UEM took third place and received a plaque, certificate and RM100 cash prize.

K2M 2024 also has 2 other competitions. In the Innovation Competition (Category A: Form 1-3), SMK Aminuddin Baki won first place and was awarded a plaque, a certificate, and RM200 cash prize. Second place went to SMK Seri Keledang. The winners received a plaque, certificate, and RM150 cash prize, while SMK Methodist (ACS) Ipoh took third place and received a plaque, certificate, and RM100 cash prize. In the Innovation Competition (Category B: Form 4-6), Kolej Vokasional Taiping won first place and was awarded a plaque, a certificate, and RM200 cash prize. Second place went to Kolej Vokasional Taiping. The winners

received a plaque, certificate, and RM150 cash prize, while SMK Jelpanag Jaya took third place and received a plaque, certificate, and RM100 cash prize.

The students also had the opportunity to participate in various exciting exhibitions and interactive games conducted by exhibitors from government agencies such as Yayasan Pembangunan Ekonomi Islam Malaysia (YaPEIM), Jabatan Alam Sekitar (JPN) Negeri Perak, Jabatan Kimia Negeri Perak and Pusat Aspirasi Anak Perak (PASAK).

Reported by:
ChM Dr. Mazlin Mohideen
Chairman, K2M 2024
24 August 2024

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Status	Date	Courses	Trainers	Code
	9 - 10 November 2024 (Saturday - Sunday)	Management of Chemicals & Chemical/Lab Wastes *eligible for 10 CEP Points by DOSH *eligible for 12 CPD Hours by EiMAS	ChM DR MALARVILI RAMALINGAM	MCCW33
	16 - 17 November 2024 (Saturday - Sunday)	MS 1042:2023 Safety in Laboratory *eligible for 10 CEP Points by DOSH	Ts DR ChM AIDIL FAHMI BIN SHADAN	SIL1
	23 - 24 November 2024 (Saturday - Sunday)	Spill, Emergency & Response Plan for Hazardous Material *eligible for 10 CEP Points by DOSH *eligible for 12 CPD Hours by EiMAS	ChM DR SHANMUGA KITTAPPA	SER3
	27 - 28 November 2024 (Wednesday - Thursday)	Calibration of Test and Measuring Instruments and Metrological Traceability	MR CHEN SOO FATT	CAL7
	2 - 3 December 2024 (Monday - Tuesday)	Procedures of Method Validation & Verification	ChM CHANG HON FONG	MVV47
	6 January 2025 (Monday)	Decision Rules and Conformity Assessment Meeting The MS ISO/IEC 17025:2017 Requirements	ChM CHANG HON FONG	DRSC8
	13 - 14 January 2025 (Monday - Tuesday)	Chemical Safety and Security *eligible for 10 CEP Points by DOSH	DATIN ChM DR ZURIATI ZAKARIA	CSS7
	16 January 2025 (Thursday)	Organizing Small Interlaboratory Comparisons (In-Person Training)	ChM CHANG HON FONG	ILC2
	18 - 19 January 2025 (Saturday - Sunday)	Understanding the Elements of MS ISO/IEC 17025:2017	ChM CHANG HON FONG	ISO52
	20 - 21 January 2025 (Monday - Tuesday)	Method Validation & Quantification of Measurement Uncertainty in Microbiological Testing	DR NEW CHIA YEUNG	MVUM9
	12 - 13 February 2025 (Wednesday - Thursday)	MS ISO/IEC 17025:2017 Management Systems Internal Auditing	ChM PUA HIANG	IAT40
	17 - 18 February 2025 (Monday - Tuesday)	Measurement Uncertainty in Chemical Analysis	ChM CHANG HON FONG	MU48

IKM Professional Centre Training Calendar

Status	Date	Courses	Trainers	Code
	19 - 20 February 2025 (Wednesday - Thursday)	Mass Spectrometry	ASSOC PROF ChM DR FATIMAH SALIM	MS3
	22 - 23 February 2025 (Saturday - Sunday)	Management of Chemicals & Chemical/Lab Wastes *eligible for 10 CEP Points by DOSH *eligible for 12 CPD Hours by EiMAS	ChM DR MALARVILI RAMALINGAM	MCCW34
	24 - 25 February 2025 (Monday - Tuesday)	General QA/QC Procedures for Testing Laboratories	ChM PUA HIANG	QAQC48
	27 February 2025 (Thursday)	Root Cause Analysis and Corrective Actions on Unsatisfactory PT Performance	ChM DR LI HUI LING	RCA7
	12 - 13 April 2025 (Saturday - Sunday)	Basic Laboratory Skills & Techniques	PROF ChM DR SHARON TEH GEOK BEE	BSLT16
	14 - 15 April 2025 (Monday - Tuesday)	Procedures of Method Validation & Verification	ChM CHANG HON FONG	MVV48
	19 - 20 April 2025 (Saturday - Sunday)	Statistical Methods for Chemists	PROF ChM DR SHARON TEH GEOK BEE	BSM30
	5 - 6 May 2025 (Monday - Tuesday)	MS ISO/IEC 17025:2017 Management Systems Internal Auditing	ChM PUA HIANG	IAT41
	19 - 20 May 2025 (Monday - Tuesday)	General QA/QC Procedures for Testing Laboratories	ChM PUA HIANG	QAQC49

Updated training calendar is available at

https://ikm.org.my/ikm-professional-centre/training-calendar/

For further information, email ayu@ikm.org.my

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Aina Syuhada Binti Mukhlis, ChM M/6754/10819/24
Ameerul Izzat Bin Abd Halim, ChM M/6718/10753/24
Artini Akhma Binti Abu Bakar, ChM M/6728/10769/24
Emmy Wahida Bte Sabri, ChM M/6753/10817/24
Faris Bin Abdullah, ChM M/6757/10831/24
Foo Sing Hao, ChM M/6740/10789/24
Jalal Bin Sharib @ Sarip, ChM M/6741/10791/24
Kamalia Assira Binti Zakaria, ChM M/6730/10771/24
Koshillah a/p Arumugam, ChM M/6750/10812/24
Lam Nyee Fan, ChM Dr. M/6726/10765/24
Lam Siew Mei, ChM M/6725/10763/24
Lee Tien Ping, ChM Dr. M/6723/10761/24
Mimi Musfiera Binti Mahmood, ChM M/6756/10829/24
Mohammad Hafiz bin Hamzah, ChM M/6751/10813/24
Mohd Khairul Fahmi Bin Abd Hamid, ChM M/6731/10773/24
Muhamad Aizuddin Bin Ahmad, ChM M/6735/10780/24
Muhammad Amirul Fikri Bin Razali, ChM M/6738/10786/24
Muhammad Hanafi Bin Husin, ChM M/6727/10766/24
Nadhiratul-Farihin Binti Semail, ChM Dr. M/6716/9661/24
Nadirah Binti Jaapar Sah, ChM M/6720/10756/24
Ng Kuan Aeng, ChM M/6742/10792/24
Nik Muhammad Fitri Bin Nik Afinde, ChM M/6724/10762/24
Noor Sabrina Binti Ansari, ChM M/6721/10757/24
Noraini binti Ahmad, ChM Dr. M/6755/10827/24
Norsyakila Binti Hamzah, ChM M/6729/10770/24
Nur Hidayah Binti Shafie, ChM M/6734/10776/24
Nur Qurratu Izzati Binti Rusli, ChM M/6749/10807/24
Nur Syahirah Binti Mohd Fauzi, ChM M/6733/10775/24
Nur Syuhadah Binti Zainal Abidin, ChM M/6758/10832/24
Nurul Amirah Binti Rusdin, ChM M/6736/10782/24
Nurul Dhabitah Binti Basri, ChM M/6743/10793/24
Nurul Husna Binti Fakharazi, ChM M/6746/10796/24
Phoon Bao Lee, ChM M/6732/10774/24
Pricilla Embung Anak Spencer Jaya, ChM M/6745/10795/24
Qamarulizzat Syazwan Bin Kamarulazua, ChM M/6747/10801/24
Rosyiela Azwa Binti Roslan, ChM Dr. M/6737/10783/24
Sahira Binti Mohd Samsuri, ChM M/6744/10794/24
Salifairus bin Mohammad Jafar, ChM M/6719/10754/24
Shafizah Binti Sa'adon, ChM Dr. M/6739/10788/24
Sharul Hafiq Bin Roslan, ChM M/6748/10802/24
Siti Hajar Binti Hadas @ Hadis, ChM M/6759/10834/24
Siti Liyana Jalilah Binti Mohd Rozali, ChM M/6722/10758/24
Syarafuddin Bin Mohd Shamsiby, ChM M/6752/10814/24
Wan Norjulia Eliana Binti Wan Zamili, ChM M/6717/10752/24
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Alimulfatah Bin Othman, ChM L/3675/10828/24
Arsha Izzabel Binti Rizal, ChM L/3658/10797/24
Cecelyea Jumin, ChM L/3677/10835/24
Che Amzar Arif Bin Che Zamri, ChM L/3660/10799/24
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Nursyarfa' Aimi Binti Masrol, ChM L/3663/10808/24
Sarah A/P Ilangovan, ChM L/3670/10822/24
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Trazenda Evron Empiang Anak Akau, ChM L/3657/10790/24
Vanessa Maria A/P Mickel, ChM L/3664/10809/24
Vannisree A/P R Arunachalam, ChM L/3653/10781/24
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Siti Farinah binti Jaiddin, ChM M/6764/9277/22/24
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