



台灣氣膠 研究學會

TAIWAN ASSOCIATION
FOR AEROSOL RESEARCH

FEBRUARY, 2026.

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President's 2026 New Year Greetings



Dear Esteemed Members and Colleagues of the TAAR,
Happy Lunar New Year!

I would like to express my sincere appreciation for your continued support and active participation in the TAAR activities. On this auspicious occasion of the Lunar New Year, I extend my warmest wishes to all members and take this opportunity to share with you TAAR's major progress and achievements over the past year.

Looking back on the past year, we have implemented three important reforms that will have a far-reaching impact. First, we modified our logo to include both Chinese and English names, enhancing TAAR's recognition and visibility across domestic and international academic communities. Second, we revised the bylaws to address key issues, including long-term inactive memberships and reserved positions for female board members. These revisions have been formally approved by the Ministry of the Interior, providing a more robust institutional foundation for TAAR's governance. Third, we adjusted the personnel. Ms. Yu-Ching She currently serves as the TAAR's administrative assistant, and we have added one part-time assistant to each of the Secretary-General and Treasurer, currently held by Ms. Hsiang-Ying Wu and Ms. Wen-Chi Huang, respectively. With the collective efforts of the administrative team, TAAR's daily operations have continued to run smoothly and efficiently.

Meanwhile, our 16 committees have operated well, advancing TAAR and aerosol science and technology in Taiwan. Following recommendations from the Long-Term Planning Committee, we held the TAAR's first Consensus Retreat last year, bringing together Honorary Presidents, current board members, and the administrative team for two days of in-depth discussion and brainstorming to build shared consensus on future development. Earlier this year, we organized the first Action Camp of the TAAR, expanding participation to committee members, focusing on key issues, and translating consensus into concrete, actionable plans to be implemented progressively over the coming months.

In terms of activities, events such as TFOSE, the Aerosol Young Scholars Tour, and T&T IAC were successfully conducted through deliberate planning. In particular, our flagship annual event, ICAST, was held successfully with the participation of Minister Chi-Ming Peng of the Ministry of Environment, former EPA Administrator Tzi-Chin Chang, international colleagues from Japan and Southeast Asia, and more than 300 scholars from Taiwan. This remarkable turnout is a clear testament to TAAR's vibrant growth. In addition, we have launched a comprehensive website redesign, which we expect to complete this year, providing members with a refreshed, more engaging online platform.

With regard to talent development, we introduced a new lecture series last year titled "Intellectual Journeys of Distinguished Aerosol Scholars." We were honored to invite Prof. Judith Chow, along with Honorary Presidents Wen-Jhy Lee and Chuen-Jinn Tsai, to share their academic journeys, offering valuable inspiration to younger generations. We also organized training courses in artificial intelligence and aerosol science, encouraging members to adopt emerging technologies more rapidly and pursue breakthrough research outcomes. In addition, new content has been added to the TAAR's newsletter to introduce aerosol-related industries and field-based practices, with the aim of broadening perspectives and strengthening the practical relevance of our research.

I would also like to express special gratitude to the Feng Tay Cultural and Educational Foundation for its generous donation, which enabled the establishment of the Professor Chiu-sen Wang Memorial Thesis Award. This award encourages graduates from master's and doctoral programs who study aerosol science and technology, public health, and occupational safety and health. TAAR has established the Professor Chiu-sen Wang Memorial Thesis Award Review and Management Committee to ensure the effective implementation of this award. In addition, we sincerely thank President Wan-Yi Wu of Huimin Environmental Tech Corp. for his generous support, providing an annual donation of NT\$100,000 to encourage domestic scholars' submissions to the journal Aerosol and Air Quality Research (AAQR).

Supporting AAQR has long been a shared consensus within TAAR. We have developed concrete action plans to encourage member submissions, with a two- to three-year implementation period. Details of these plans will be announced soon. We hope that, by enhancing short-term submission incentives, AAQR will establish a firm footing amid an increasingly competitive international journal landscape and move toward stable, sustainable long-term development.

Finally, I would like to extend my heartfelt thanks to my entire working team—including the Secretariat, the Treasurer's Office, and the chairs and members of all committees—for their dedication and hard work over the past year. I am also deeply grateful to our Honorary Presidents and board members for their guidance and valuable advice. Most importantly, I thank every member for your participation and support. With our collective efforts, I am confident that both TAAR and aerosol research in Taiwan will continue to advance, that our members' research achievements will reach new heights, and that we will realize our shared vision of learning together, growing together, and prospering together.

Wishing all members great success and continued achievements in the Year of the Horse!

President of the TAAR

A handwritten signature in black ink, appearing to read "Shih Chun-feng". The signature is written in a cursive, flowing style with some loops and flourishes.

Calendar of Events

- **Date**

2-7 August, 2026

- **Conferences**

2026 Asia Oceania Geosciences Society (AOGS)

- **Location**

Fukuoka, Japan

- **Website**

<https://www.asiaoceania.org/AOGS2026/Home>

- **Date**

30 August–5 September, 2026

- **Conferences**

12th International Aerosol Conference (IAC 2026)

- **Location**

Xi'an, China

- **Website**

<https://iac2026.csp.org.cn/?sid=3742&mid=954&v=100>

- **Date**

7-11 September, 2026

- **Conferences**

iCACGP-IGAC International Global Atmospheric Chemistry Conference 2026

- **Location**

Heraklion, Crete, Greece

- **Website**

<https://icacgp-igac2026.org/>

Calendar of Events

- **Date**

26-30 October, 2026

- **Conferences**

American Association for Aerosol Research (AAAR) 44th Annual Conference

- **Location**

Pasadena, California

- **Website**

<https://www.aaar.org/meetings-events/meetings-and-events/>

- **Date**

2-5 November, 2026

- **Conferences**

18th International Conference on Electrostatic Precipitation (ICESP Taipei 2026)

- **Location**

Taipei, Taiwan

- **Website**

<https://conference.gigvvy.com/icesp2026>

- **Date**

5-10 September, 2027

- **Conferences**

2027 European Aerosol Conference (EAC 2027)

- **Location**

Ljubljana, Slovenia

- **Website**

<https://eac2027.si/>

Report on the Visit to Research Institutes in Tsukuba, Japan (January 2026)

This visit, centered on "Deepening Taiwan-Japan Aerosol Research and Journal Strategic Cooperation," marks a significant milestone in the relationship between the Taiwan Association for Aerosol Research (TAAR) and the Japan Association on Aerosol Science and Technology (JAAST). Led by Prof. George Lin and Prof. T.C. Hsiao, this four-day tour of research institutes in Tsukuba included field observations, academic seminars, and the formal signing of a Memorandum of Understanding (MOU), demonstrating a shared commitment to addressing atmospheric environmental challenges.

1. Overview

- **Dates** : 2026/01/05 – 2026/01/08
- **Location** : Tsukuba, Ibaraki, Japan
- **Institutions** :
 - MRI
 - NIES
 - AIST
 - University of Tsukuba
- **Key Participants** :
 - Prof. George Lin, NCU, AAQR Editor-in-Chief
 - Prof. T.C. Hsiao, NTU
 - Dr. Mizuo Kajino (MRI), Dr. Naoki Kaneyasu (AIST, JAAST President), Dr. Yosuke Sakamoto (NIES), etc.

2. Itinerary and Highlights

Jan 6: Mt. Tsukuba Field Observation & NIES International Seminar

In the morning, the delegation visited **the Mt. Tsukuba** monitoring station. Under clear skies, the team conducted technical exchanges in front of the monitoring equipment. In the afternoon, the visit continued at the **National Institute for Environmental Studies (NIES)** for an international seminar, where Prof. George Lin delivered a keynote on 7-SEAS and NASA/ASIA-AQ observation missions.



- The delegation posing in front of the Mt. Tsukuba monitoring station to understand the current state of high-altitude atmospheric observations in Japan.



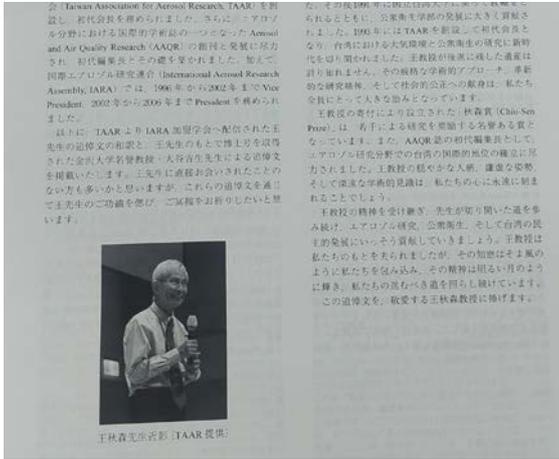
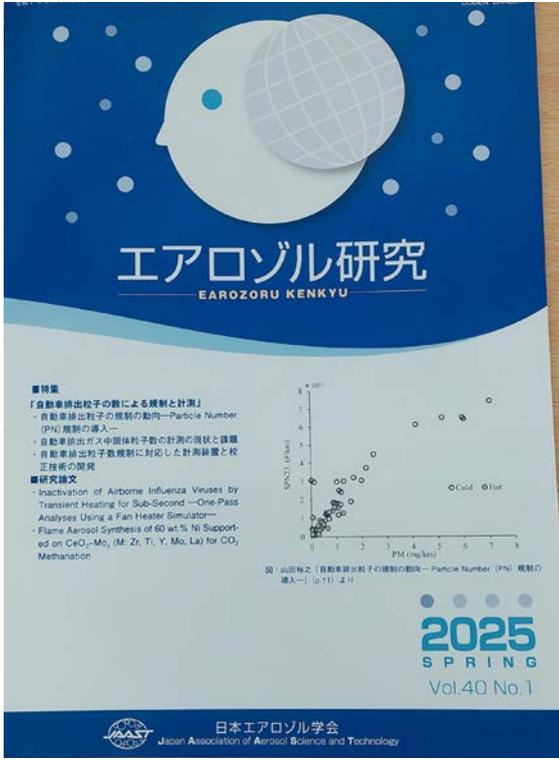
- Prof. George Lin delivering a keynote lecture at NIES, sharing the latest results of atmospheric observations in the Asian region.

Jan 7: MOU Signing Ceremony & AIST Lab Tour

The highlight of the trip took place at the **National Institute of Advanced Industrial Science and Technology (AIST)**. **Dr. Naoki Kaneyasu** (President of JAAST) and **Prof. George Lin** (Editor-in-Chief of AAQR) formally signed a Memorandum of Understanding (MOU), establishing a long-term partnership. This was followed by a tour of Dr. Kenjiro Iida's laboratory for in-depth technical discussions.



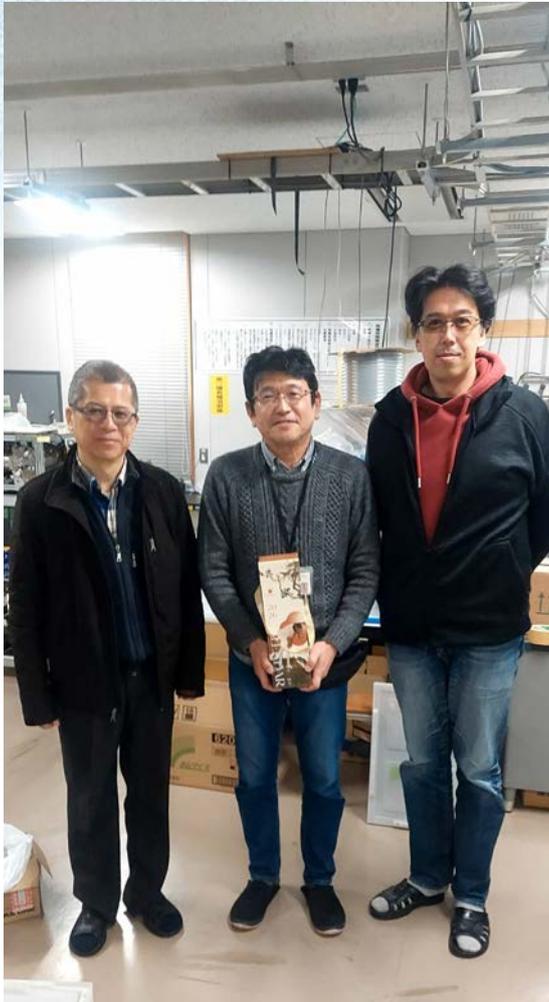
- **The President of JAAST and the Editor-in-Chief of AAQR shaking hands after signing the MOU, symbolizing a new milestone in Taiwan-Japan aerosol research cooperation.**



- The JAASST journal "Aerosol Research" (Spring 2025) featured a memorial article for Prof. Chiu-Sen Wang, honoring his exceptional contributions to academic exchange between Taiwan and Japan.

Jan 8: Expert Meetings & Conclusion

The final day featured intensive meetings at NIES with experts including Dr. Kei Sato, Dr. Yosuke Sakamoto, and Dr. Yuji Fujitani to discuss specific research collaboration projects. The delegation departed from Tsukuba Center for Narita Airport in the evening, marking the successful conclusion of this productive academic trip.



- Prof. George Lin and Prof. T.C. Hsiao visiting the NIES laboratory, engaging in technical discussions on atmospheric monitoring technology with Dr. Satoshi Inomata and Dr. Yuji Fujitani, and presenting a commemorative gift.

3. Conclusion

This visit not only consolidated the technical exchange in aerosol science but also laid a solid foundation for future journal development and international research through the **signing of the MOU between AAQR and JAAST**. Both parties look forward to meeting again at the annual conference in Kanazawa University this August to further enhance the impact of environmental research in Asia.

The 2025 Distinguished Aerosol Scholars Lecture Series



Prof. Chuen-Jinn Tsai

This lecture, centered on “Strengthening Industry–Academia Collaboration,” offered a concise reflection of Taiwan’s aerosol technology development. Lifetime Chair Professor and Honorary Professor Chuen-Jinn Tsai shared his decades-long journey spanning academia and industry—from his education and early industrial experience to more than 30 years of teaching and research after returning to Taiwan. His career exemplifies how fundamental science can be translated into real industrial applications, forming a cycle from research to practice and ultimately to societal benefit.

After graduating from National Taiwan University in mechanical engineering, Prof. Tsai worked as an engineer at China Steel Corporation, gaining hands-on industrial experience before pursuing advanced study at the University of Minnesota under Prof. David Pui and Prof. Benjamin Liu, leading figures in aerosol science. There, he built a strong foundation in aerosol instrumentation and micro-contamination control. Back in Taiwan at National Yang Ming Chiao Tung University, his long-term work on PM_{2.5}, air pollution, and nanoparticles combined academic research with field validation and engineering practice. His efforts demonstrated that aerosol technologies can effectively help industries reduce emissions and improve environmental quality, highlighting the practical value of fundamental research.



The lecture emphasized that under net-zero trends and tightening environmental regulations, industries face not only technical barriers but also cost, operational stability, and long-term maintenance concerns. What companies truly need are reliable, energy-efficient, regenerable, and field-verified solutions—not theory alone. Successful collaboration depends on understanding on-site needs and continuously refining technologies until they are not just feasible, but usable.

Prof. Tsai also stressed diverse collaboration platforms—publications, conferences, workshops and patents—to promote knowledge exchange. Students and research teams remain the driving force of innovation, and long-term cultivation of interdisciplinary talent is essential for aerosol technologies to support net-zero transitions and air pollution control. Overall, the lecture illustrated both a personal academic journey and the broader role of aerosol technology in sustainable development and industrial transformation.

Industrial Symbiosis, Carbon Reduction Innovation, and Sustainable Transformation: An Interview on Taiwan Cement Corporation's (TCC) ESG Journey

Interviewer: Taiwan Aerosol Research Association

Interviewee: Representative of Taiwan Cement Corporation (TCC)



1. Introduction: From an Industrial Enterprise to a Community Partner

Since Chairman Nelson Chang assumed office in 2017, Taiwan Cement Corporation (TCC) has embarked on a profound sustainability transformation. Chairman Chang articulated two core principles: “Industry should be part of the community” and “Environmental self-discipline must go beyond regulatory compliance.” He emphasized that enterprises should no longer operate as closed industrial fortresses, but rather coexist and interact symbiotically with their surrounding communities.

Beginning with the Hualien Hoping Plant, TCC established a transparent and open environmental monitoring system, including real-time transmission of PM_{2.5}, NO_x, and SO_x data to the Hualien County Environmental Protection Bureau, with simultaneous display on public screens accessible to local residents. This mechanism of data transparency not only strengthened public trust, but also initiated a deeper dialogue between industry and society.

2. Environmental Dimension (E): Carbon Reduction Strategy and Carbon Capture Innovation

As early as 2017, TCC launched research on carbon capture, utilization, and storage (CCUS) technologies. In collaboration with the Industrial Technology Research Institute (ITRI), TCC developed a calcium looping carbon capture system, in which captured CO₂ is used to cultivate microalgae for bio-oil extraction and *Haematococcus pluvialis* for astaxanthin production. This integrated approach combining carbon recycling and bioenergy development represents a pioneering achievement in Taiwan's industrial sector.

However, TCC also acknowledges the ongoing challenge of balancing energy consumption and capture efficiency. Excessive energy use during capture could undermine net carbon reduction benefits. Accordingly, TCC is advancing technological optimization through oxy-fuel and pure oxygen combustion to improve capture efficiency. Notably, among the world's top ten building materials companies, TCC allocates only 18% of its net-zero pathway to carbon capture, reflecting a pragmatic stance—prioritizing immediately feasible carbon reduction actions over reliance on immature technologies.

3. Energy Transition and Circular Economy: From Waste Symbiosis to Diversified Green Energy

At the outset of Chairman Chang's tenure, TCC initiated equipment upgrades across cement plants in Taiwan and mainland China, promoting high-temperature co-processing technology. Operating at temperatures up to 1,700°C, cement kilns can safely process industrial and municipal waste, achieving a triple benefit of waste reduction, carbon reduction, and energy generation.

This transformation repositioned cement plants from traditional manufacturers to “urban purifiers,” while also creating new environmental revenue streams that align ecological and economic value. In parallel, TCC has diversified its renewable energy portfolio to include offshore wind power, geothermal energy, ocean thermal energy conversion, and solar energy symbiosis systems. The Hualien Hoping Industrial Park has become Taiwan's first industrial symbiosis demonstration zone, showcasing a model circular economy in practice.

4. Social Dimension (S): From Conflict to Coexistence— Community Engagement in Practice

In earlier years, residents of the Hualien Hoping area expressed significant concerns regarding industrial facilities. TCC adopted a door-to-door household engagement approach, fostering dialogue and trust through direct communication and concrete actions. Initiatives included eco-friendly fishing events, the Hoping Park visitor zone, and the establishment of the world's only Starbucks located within a cement plant—all of which reshaped public perceptions of industrial spaces and became catalysts for local revitalization.

The Hoping Park has also generated substantial employment opportunities for women: 95% of tour guides, market vendors, and cleaning staff are female. Social Return on Investment (SROI) assessments indicate that the greatest impact lies in enhanced women's self-confidence and social participation, underscoring the project's broader social value.

5. Governance Dimension (G): Internal Culture and Global Alignment

TCC now operates across 11 industries in 14 countries, with employees communicating in eight languages, presenting significant challenges in global governance. To address this complexity, the company established a Carbon Academy, compliance training programs, and quarterly global Town Hall meetings, embedding ESG principles into the organization's DNA.

Employees are required to self-assess their sustainability contributions as part of annual performance evaluations and to participate in ESG training and volunteer activities. TCC publishes more than eight reports annually, including Sustainability Reports, TCFD, TNFD, and IMPACT reports, all of which undergo third-party verification to ensure transparency and international alignment.

6. Future Outlook: Sustainability as a Core Corporate Strategy

In response to global carbon neutrality trends, TCC continues to advance along three strategic pillars: carbon reduction, energy creation, and social inclusion. Over the next five to ten years, the company will focus on improving carbon capture efficiency and commercialization, stabilizing renewable energy systems, deepening community co-prosperity and women's empowerment, and integrating cross-border ESG governance frameworks.

TCC aspires to serve as a bridge between industrial civilization and nature, demonstrating a Taiwanese model of sustainable transformation in the global net-zero transition.

7. Conclusion

From environmental technologies to social inclusion, from green energy innovation to corporate culture, TCC's seven-year transformation represents a shift from "high-carbon industry" to "low-carbon symbiosis." As the interviewee aptly stated: "Industry should not merely exist passively within society, but actively participate as a partner in community life." This transformation has not only reshaped TCC's corporate identity, but also provided one of Taiwan's most representative examples of sustainable industrial development.

Expert Profile



Szu-Chieh Chen

Current Position

Department of Public Health, Chung Shan Medical University
Professor

Qualification

Department of Bioenvironmental Systems Engineering,
National Taiwan University

PhD

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Recent Research Topics

Dr. Szu-Chieh Chen is currently a Full Professor in the Department of Public Health at Chung Shan Medical University (CSMU), Taiwan. She is passionate about both research and teaching at CSMU. She has led several research projects funded by the National Science and Technology Council (NSTC) and teaching practice research projects supported by the Ministry of Education (MOE).

She earned her bachelor's degree in Environmental Engineering and Management from ChaoYang University of Technology (CYUT), Taiwan. and later received her Ph.D. degree in Department of Bioenvironmental Systems Engineering from National Taiwan University in 2007.

During her time at CSMU, her research has focused on dynamic modeling of infectious diseases, particularly influenza, tuberculosis (TB), dengue fever (DF), COVID-19 and disease burden. In the area of health risk assessment, her work has concentrated on environmental and exposure assessment to bisphenol A (BPA), polycyclic aromatic hydrocarbons (PAHs), heavy metals (HMs), poly- and perfluoroalkyl substances (PFASs) and microplastics (MPs).

Research Interests: Human health risk assessment, Dynamic modeling of infectious diseases, and Public Health.

1. Toxic metal-adsorbed microplastics threaten human digestive system: a bioaccessibility-based risk assessment

Human toxicological parameters for microplastics (such as reference doses) have not yet been established. Therefore, the research aimed to develop an integrated, risk assessment oriented analytical framework based on an exposure scenario in which microplastics adsorb heavy metals, while incorporating bioaccessibility and human gastrointestinal exposure pathways. This study advances microplastics health research from descriptive observation toward quantitative risk assessment, strengthens attention to food safety and mixed contaminant issues, and provides a scientific basis for the development of future exposure standards.

Preliminary results indicate that microplastics in aquatic environments can act as carriers of toxic metals, and that environmental aging alters their surface properties, increasing the adsorption capacity for hexavalent chromium (Cr(VI)) and lead (Pb) by approximately ninefold, thereby elevating the potential risk of dietary exposure. By integrating experimental data on metal adsorption with a digestion kinetic model based on oral bioaccessibility, the study estimated the average daily intake across different age and sex groups at various stages of digestion and conducted non-carcinogenic risk assessments using hazard quotients and margins of exposure. The results show that children aged 0–3 years bear the highest health risk, with the risk mainly concentrated in the gastric digestion phase. Among dietary sources, fish, bivalves, and crustaceans were identified as the primary intake pathways of microplastics carrying toxic metals, and both food consumption rates and the concentration of specific microplastics in food were key sensitive factors influencing risk. Overall, this study proposes an alternative exposure pathway whereby microplastics adsorbing toxic metals can be transferred through the food chain to the human gastrointestinal system. Although no immediate health hazard was identified, the observed age-related differences and aging effects provide important implications for public health policy.

2. Disease burden due to COVID-19 in Taiwan: disability-adjusted life years (DALYs) with implication of Monte Carlo simulations

Due to significant differences in COVID-19 prevention strategies across countries, such as social distancing, border controls, hygiene measures, and vaccine coverage, the health impact of the pandemic varies among different population groups. Therefore, it is necessary to systematically assess the disease burden of COVID-19 in Taiwan, taking key demographic factors such as age and sex into account. This study focuses on the disease burden of COVID-19 in Taiwan, using data from the national communicable disease surveillance system to calculate YLLs (Years of Life lost), YLDs (Years of Life Disability), and DALYs (Disability-adjusted Life Years), in a manner comparable to most international studies that rely on Global Burden of Disease (GBD) data. The dataset covers the early phase of the outbreak in Taiwan (January 2020 to November 2021), from which overall disease burden indicators (DALYs) were estimated. Monte Carlo simulations were applied to quantify uncertainties in disease severity and duration, thereby enhancing the scientific rigor of the estimates.

The results show that DALYs increase significantly with age, reaching the highest levels in those aged 70 and above. In addition, males exhibited higher DALYs than females, with the difference being more pronounced among older adults; specifically, males aged 70 and above had 332.49 DALYs per 100,000 population, compared to 204.01 DALYs per 100,000 for females, primarily due to higher mortality among males. Further analysis indicates that 99.9% of DALYs in the population aged 70 and above were attributable to YLLs, with only 0.1% from YLDs, highlighting the decisive impact of mortality on disease burden in this age group. Overall, this study indicates that the health impact of COVID-19 in Taiwan is concentrated among older males, suggesting that future public health policies should prioritize the protection of high-risk groups and the allocation of healthcare resources to reduce long-term health impacts.

3. Assessing bisphenol A (BPA) exposure risk from long-term intakes of dietary in Taiwan

This study examined the exposure risk of bisphenol A (BPA) in the Taiwanese population by combining long-term data from the National Nutrition Survey with BPA concentrations in common foods. Compared with large-scale surveys conducted in the United States, Canada, Europe, and mainland China, Taiwan's research in this area has developed relatively later. Internationally, BPA exposure has received considerable attention. Current results focus only on dietary exposure sources; however, the European Food Safety Authority (EFSA) has assessed hazards from multiple exposure pathways and has established a tolerable daily intake (TDI) for humans ($\mu\text{g}/\text{kg}$ body weight/day).

Preliminary findings indicate that average daily intake (ADD) of BPA is highest among children aged 6–9 years and lowest among adults aged ≥ 65 years. Hazard quotients (HQs) for all age groups were below 1, suggesting that health risks from dietary BPA exposure are relatively low. Among food items, salmon, pork, and chicken contributed most to BPA intake, with BPA concentrations in these foods significantly higher than in other dietary sources. This study provides insight into BPA levels in domestic foods, showing that fish and meat contain higher concentrations compared with rice, vegetables, and fruits. These findings can be discussed in the context of international research and used to inform control measures for BPA release and human exposure throughout the food supply chain, including production, processing, transportation, and packaging.

Announcements

The fifth joint meeting of the 17th Board of Directors and Supervisors was held on December 27, 2025. The following membership applications were reviewed and approved during the meeting: 2 Individual Lifetime Full Member, 3 Regular Member, and 2 Junior Members — a total of 7 new members. Welcome to join the Taiwan Association for Aerosol Research!

Lifetime Member

Chun-Jen Tsai

PhD Student

Department of Civil Engineering, Chung Yuan Christian University

Yu-Mei Hsu

Project Associate Research Fellow

National Kaohsiung University of Science and Technology

Announcements

Regular Member

Po-Jui Chen

PhD Student

Institute of Environmental and Occupational Health Sciences, National Yang Ming Chiao Tung University

Subham Halder

PhD Student

Institute of Environmental Engineering, National Sun Yat-sen University

Phan Văn Sang

PhD Student

Institute of Environmental and Occupational Health Sciences, National Yang Ming Chiao Tung University

Junior Member

Hsiang-Lien Chen

PhD Student

Graduate Institute of Environmental Engineering, National Taiwan University

Chi An Tseng

Master Student

Institute of Environmental Engineering, National Sun Yat-Sen University