

Report on the 2015 International Chemical Congress of Pacifichem Basin Societies (Pacifichem 2015), December 15-20, Honolulu, Hawaii: Symposium on Frontiers in Flow Injection Analysis and Related Techniques

Gary D. Christian

Department of Chemistry, University of Washington, Box 351700, Seattle, WA 98195-1700

Pacifichem is held every five years, and is sponsored jointly by the American Chemical Society (ACS), the Canadian Society for Chemistry (CSC), the Chemical Society of Japan (CSJ), the New Zealand Institute of Chemistry (NZIC), the Royal Australian Chemical Institute (RACI), the Korean Chemical Society (KCS), and the Chinese Chemical Society (CCS). The American Chemical Society was the host society for the 2015 Congress. Participating organizations included the Chemical Society of Thailand (CST) and the Japan Society for Analytical Chemistry (JSAC). The Division of Analytical Chemistry of the American Chemical Society provided support for analytical symposia. The theme of Pacifichem 2015 was Chemical Networking: Building Bridges Across the Pacific, emphasizing the collaborative nature of chemistry as a multidisciplinary science and the opportunities to network with Pan-Pacific research groups at the Pacifichem meetings.

The Symposium on Frontiers in Flow Injection Analysis and Related Techniques was organized by Toshiko Imato (Kyushu University, Japan), Gary Christian (University of Washington, USA), Kate Grudpan (Chiang Mai University, Thailand), Spas Kolev (Melbourne University, Australia), and Akhmad Sabarudin (Brawijaya University, Indonesia). Toshihiko Imato arranged the program and other details. There were thirty oral presentations (23 invited-I; 7 contributed-C) and 13 poster presentations. The symposium was sponsored by the Japanese Association for Flow Injection Analysis (JAFIA).

The Pacifichem opening ceremony and reception were held Tuesday evening, December 15th, with fine weather, which remained for the duration of the conference. On Saturday evening, Jarda Ruzicka invited a number of participants and friends to his home at Hawaii Kai for a relaxing party and viewing of the Christmas boats, which went by his house.

The symposium was held at the Marriott Waikiki Beach Hotel during the first two days of the Congress, Tuesday morning and afternoon, and Wednesday morning and afternoon, with the poster session Thursday morning. Presiders were Toshihiko Imato and Gary Christian for the Tuesday morning sessions, Hideyuki Itabashi and Orawon Chailapakul for the Tuesday afternoon sessions, Spas Kolev and Toshio Takayanagi for the Wednesday morning sessions, and Duangjai Nacapricha and Norio Teshima for the Wednesday afternoon sessions.

Oral Presentations

The opening lecture was given by *Gary Christian* (I), who traced the history of the International Conference on Flow Injection Analysis (ICFIA) in promoting international collaborations. *Jarda Ruzicka* (I-University of Hawaii, USA) followed with a description of a blueprint for a universal flow analyzer.

Spas Kolev (I) reported an online fractionation and

determination of mercury in environmental solids using a sequential injection approach with atomic fluorescence detection. *Ziyi He* (I-Tsinghua University, China) developed enhanced chemiluminescence of peroxyoxynitrous acid by carbon nanoparticles for application in flow injection analysis. *Orawon Chailapakul* (I-Chulalongkorn University, Thailand) described an ultra-rapid determination of Cr(VI) by stop-flow sequential injection analysis coupled with electrochemical detection using polyaniline-graphene quantum dots-modified screen-printed carbon electrodes. *Tsutomu Nagaoka* (I-Osaka Prefecture University, Japan) applied conducting polymers to sensors and trapping agents for bacterial detection.

Kei Toda (I-Kumamoto University, Japan) monitored ppbv-level volatile sulfur compounds by a continuous gas absorbing and miniaturized flow analysis method. *Paul Krolkowski* (I-Amgen, USA) described improvements in flow-injection NMR as a tool for high-throughput sample analysis. *Toshihiko Imato* (C) developed flow-based chemical analysis using streams driven by centrifugal force.

Charles Lucy (I-University of Alberta, Canada) reported on advances in high speed ion chromatography. *Norman Dovichi* (I-Notre Dame University, USA) was able to identify over 10,000 peptides from the HeLa proteome using single-shot capillary zone electrophoresis-tandem mass spectrometry. *Duangjai Nacapricha* (I-Mahidol University, Thailand) described the measurement of octanol-water partition coefficient by zone fluidics.



Pacifichem opening ceremony

Paul Francis (I-Deakin University, Australia) reported on advances in chemiluminescence detection for flow analysis. *Hideji Tanaka* (I-Tokushima University, Japan) developed flow analyses utilizing periodically varying flow rate, with feedback-based flow ratiometry and amplitude modulated multiplexed flow analysis. *Makoto Kurihara* (I-Shizuoka University, Japan)

developed a catalytic flow-injection analysis method using the oxidation reaction of N-(3-sulfopropyl)-3,3',5,5'-tetramethylbenzidine. *Hideyuki Itabashi* (I-Gunma University, Japan) performed speciation of heavy metal ions in soil samples by sequential extraction using his all injection system.

Jonathan Sweedler (I-University of Illinois, USA) used microfluidic devices for controlling the environment around dorsal root ganglion neurons and collecting stimulated release of transmitters and peptides. *Nuanlaor Ratanawimarnwong* (I-Srinakharinwirot University, Thailand) described a membraneless vaporization unit coupled with a flow analysis system for determination of volatile compounds.

Norio Teshima (I-Aichi Institute of Technology, Japan) reported on the analysis of biological samples by flow analysis and its potential to medical support. *Yasuhiro Iida* (I-Kanagawa Institute of Technology, Japan) employed flow injection analysis of β -secretase activity by using immobilized recombinant fusion β -secretase and application of the system for the inhibitor. *Ryoichi Ishimatsu* (C-Kyushu University) developed a flow immunoassay based on carbon nanodots. *Satoshi Fujinaga* (C-Doshisha, Japan) described specific fluid behavior of mixed solutions in a micro-space and its application.

Robert Kennedy (I-University of Michigan, USA) described microfluidic droplet systems for high-throughput analysis and sensing. *Toshihiko Imato* (I) reported also on flow analysis based on optical devices fabricated by organic thin films. *Toshio Takayanagi* (I-Tokushima University) developed flow injection analyses for the inhibitory assay of xanthine oxidase and the assay of oxidant scavenging capacity. *Shin-Ichi Ohira* (I-Kumamoto University) used electrodynamic ion transfer for sample pretreatment, separation and preconcentration for ionic solute analysis.

Hitoshi Mizuguchi (I-Yamagata University, Japan) described an electrochemical flow-through cell fabricated with track-etched microporous membrane electrodes and its applications in flow analysis. *Stuart Chalk* (C-University of North Florida, USA) told of bringing flow injection analysis to the semantic Web. *Aprilia Tasfyati* (C-Brawijaya University) used organic polymer-based monolith for fast, efficient, and environmentally friendly separation of DNA samples. *Manami Mitsunobu* (C-Okayama University, Japan) concluded the oral sessions with a report on fusion of oil droplets in a microfluidic device using optical tweezers.

Poster Presentations

The poster presentations included a range of fundamental, instrumentation, and application studies. The university affiliations given here are from Japan unless otherwise stated.

Takashi Sumida (Kochi Industrial Technology Center) determined trace phosphate by ICP/AES using novel polyallylamine type adsorbent packed in a column. *Prawpan Inpota* (Mahidol University, Thailand) described a micro-flow system using a PDMS microchip with chemiluminescence detection for investigation of nanoparticle-metal interaction. *Akira Nakajima* (University of Miyazaki) applied a flow-injection spin-trapping ESR method for evaluating the alkoxy radical elimination capacity (AREC) of selected antioxidants. *Yumi Kobayashi* (Kanagawa Institute of Technology) described the quartz microbalance sensing of catechin.

Hideji Tanaka (Tokushima University) reported on the pretreatment of phosphorus compounds by electrogenerated cobalt(III) ions and its evaluation by flow injection analysis. He also described a nitric acid gas generator. *Ayaka Inoguchi* (Aichi Institute of Technology) used automatic on-line solid-phase



Toshihiko opening

extraction-ICP-MS exploiting sequential injection analysis for ultratrace vanadium determination in human urine samples. *Yumika Yoshino* (Aichi Institute of Technology) determined gaseous isoprene by flow injection analysis with fluorometric detection. *Mayuko Takemoto* (Hiroshima University) described a flow method for preparation of a gold nanoparticle-polyamide nanohybrid using reverse micelles adsorbed on glass surfaces.

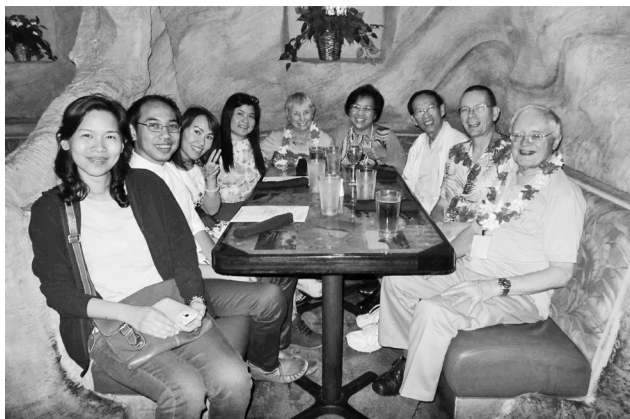


Elsevier reception



JAFIA Party

Nathawut Choengchan (King Mongkut's Institute of Technology, Thailand) used a novel chromosensor and sequential injection system for fluorometric determination of mercury(II). *Naoto Yoshikawa* (Yamagata University) described an electrochemical flow-through cell fabricated with a nanohole shaped gold electrode. *Jirayu Sitanurak* (Mahidol University,



JAFIA Party

Thailand) developed an on-line pretreatment flow injection system for direct and simultaneous measurement of iodide and creatinine in human urine. *Minoru Adachi* (Kanagawa Institute of Technology) described the development of a novel FRET substrate for β -secretase activity assay.

JAFIA Party



JAFIA party

All symposium participants were invited by the Japanese Association for Flow Injection Analysis to a dinner party following the Wednesday afternoon oral session. We were treated to a fun-filled dinner and drinks at the Jimmy Buffet restaurant. Our thanks to Norio Teshima and Toshihiko Imato for arranging this special evening, and to JAFIA for their generosity.