HETEROCYCLES, Vol. 105, No. 1, 2022, pp. 1 - 6. © 2022 The Japan Institute of Heterocyclic Chemistry
DOI: 10.3987/COM-22-S(R)Foreword_1

# PREFACE TO HETEROCYCLES SPECIAL ISSUE HONORING THE 80TH BIRTHDAY OF PROFESSOR DR. SOMSAK RUCHIRAWAT: A GREAT TEACHER AND COMPASSIONATE MENTOR

Minoru Isobe and Poonsakdi Ploypradith

It is a privilege and honor for both of us to contribute the Preface for the Special Issue of Heterocycles to honor Professor Dr. Somsak Ruchirawat on the occasion of his 80th birthday.

After receiving his diploma from Triam Udom Suksa School, Professor Somsak Ruchirawat was accepted to the University of Medical Sciences (now Mahidol University) as a pre-medical student. After spending two years there, with the love of organic chemistry and the persuasion of the late Professor Stang Mongkolsuk (the founding Dean of the current Faculty of Science, Mahidol University), he changed the course of his study and, in 1963, received the Colombo Plan Scholarship sponsored by the British Government for undergraduate and graduate studies at the Department of Chemistry, The University of Liverpool, England. He received his B.Sc. (Hons) in chemistry in 1966 and subsequently awarded a Ph.D. in organic chemistry in 1969 under the supervision of the late Professor Sir Alan R. Battersby FRS who moved to Cambridge University that year. He then returned to Thailand and after a year as a lecturer in the Department of Chemistry, Mahidol University, he was awarded a SEATO fellowship to carry out research at the Massachusetts Institute of Technology (MIT) as a postdoctoral fellow, followed by another appointment at Boston University as a Research Associate supported by the National Cancer Institute (NCI), USA.

The late Professor Sir Alan Battersby had been very inspirational to him starting from his undergraduate years and convinced him that, by selecting the project on the biosynthesis of natural products (alkaloids) for his Ph.D. study, he would receive training in various aspects of organic chemistry. First, in the organic synthesis, he had to learn and master how to synthesize the biosynthetically proposed/hypothetical precursors both as the labeled and the non-labeled compounds. During the subsequent feeding experiments, once the labeled compound was fed to the plant, he would obtain all the training in natural products; he had to isolate the compound of interest as well as others in that plant for further study including structure elucidation and degradative study to locate the site of labelling. Subsequently, he would have to study and utilize the organic as well as enzymatic reaction mechanisms to account for the plausible conversion of the precursors to the final product. Indeed, he found that the training under the late Professor Sir Alan Battersby has shaped his career research as evidenced in his publications. He had been in contact with the late Professor Sir Alan Battersby until his very sadly passing away in February 2018.

As one of the eminent professors in organic chemistry not only in Thailand, his research work has featured his creativity and insights both in organic synthesis and natural products chemistry. His continuing interests in alkaloids have resulted in successful total synthesis of isoquinolines and isoquinoline-derived compounds including lamellarins, ningalin C, michellamine B, lennoxamine, buflavine, argemonine, colchicine, papaverine, and diospyrol, mefloquine, many of which have exhibited various biological activities such as anticancer, anti-inflammatory, antimalarial, antimicrobial, antioxidant, and anti-HIV, just to name a few. Successful preparation of these compounds has further enabled studies in the related fields including medicinal chemistry, biochemistry, as well as drug discovery and development. His research work in organic synthesis has inspired subsequent generations of chemists in Thailand to follow his footsteps to (1) devise new and efficient synthetic methods, (2) showcase how these developed methods could be employed in the total synthesis of natural products, and (3) collaborate with scientists in other fields to tackle important scientific problems by integrating knowledge and expertise in organic chemistry.

Apart from the intrinsic interests in the novel structures of biosynthetic interests, his research in the field of natural products is to study plants and other bioresources from Thailand including natural products from marine organisms and natural products from microorganisms for chemicals that may serve as lead compounds for further development into new drugs for various diseases. In addition, they may be used as indispensable tools in biomedical research. Hundreds of natural products have been isolated and identified in these endeavors and the structures of many of these compounds are novel and unique with interesting pharmaceutical profiles for further investigation. The plant families that have been investigated include: Alangiaceae, Calophyllaceae, Celastraceae, Euphorbiaceae, Fabaceae, Putranjivaceae, Simaroubaceae. Thai marine sponges have also been investigated including *Smenospongia* sp., *Halichondria* sp., *H. gumminae* and *H. erectus*.

One of the highlights and contentment in his life is that he has the honor to serve Her Royal Highness Princess Chulabhorn Krom Phra Srisavangavadhana since the establishments of the Chulabhorn Research Institute (CRI) in 1987 and the Chulabhorn Graduate Institute (CGI) in 2005. He has involved in the organization of all the Princess Chulabhorn Science Congresses starting from the 1st Princess Chulabhorn International Science Congress (10-13 December 1987) on "International Congress on Natural Products" where he acted as the Secretary on the Scientific Program. He has had numerous wonderful opportunities in accompanying Professor Dr. H.R.H. Princess Chulabhorn to attend many scientific conferences and meetings, to be acquainted with many prominent scientists as well as to visit a number of leading universities and research organizations around the world. These enrichments have resulted in collaborations in various international programs.

During 2001 to 2011, an international National Science Foundation (NSF)-supported program, namely the ThaiREU Program (Thai Research Experiences for Undergraduates), was established in collaboration with Professor Rebecca Braslau of the Department of Chemistry, University of California Santa Cruz. By a competitive US-wide application process, eight US citizens or permanent residences with junior standing were selected annually to participate in a rigorous 10-week summer research in chemistry organized at CRI, Chulalongkorn University, and Mahidol University, with CRI serving as the program hub. Over seventy students were the products of such program, many of whom had undertaken their graduate careers in leading universities in the US including Harvard, MIT, University of California Berkeley, and Johns Hopkins University. During the decade-long existence of the ThaiREU, ten students carried out their summer research projects under the guidance of Professor Ruchirawat, ranging from designing new synthetic methods to isolating and elucidating structures of novel natural products.

Since Japan and Thailand has had fruitful scientific collaborations, the formal program in chemistry and pharmaceutical sciences were co-established by the two supporting agencies in both countries, namely the Japan Society for the Promotion of Sciences (JSPS) and the National Research Council of Thailand (NRCT) for which he served as the coordinator for over ten years. Main activities of this JSPS-NRCT program included bilateral scientific staff exchange, jointly organized annual symposia, and collaborative research networking. Numerous productive research exchanges were evident by joint publications among researchers and faculty members from various institutions both in Thailand and Japan. Since 2003, with the initiative of Professor Minoru Isobe of Nagoya University along with country coordinators for which Professor Ruchirawat has served for Thailand until a new platform for the international collaborations and networking among Asian countries has been established as the Asian CORE Program (ACP). Below is the excerpt regarding the establishment and the prosperity of the ACP through the closely-knitted collaboration between Professor Ruchirawat and Professor Isobe.

“Prof. Ruchirawat and I knew each other on the occasion of the first Princess Chulabhorn International Science Congress (PC-1) on natural product chemistry in Bangkok 1987, in which I had been invited to actively participate. Since then, Prof. Ruchirawat and I became close friends to each other; such friendship has resulted in some fruitful collaboration: Thai scientists visiting Nagoya University via the JSPS-NRCT program and I had the opportunity to visit both CRI and CGI to give lectures and courses on the basis of the memorandum of understanding (MOU) signed between Nagoya University and CRI-CGI. In September 2004, Prof. Ruchirawat participated in a preliminary meeting in Nagoya to discuss the establishment of an East and Southeast Asia-based collaborative and networking program. It was an important meeting in order to inaugurate JSPS-supported Asian Core Program (ACP) in 2005 as the first example of a multinational Asian program. We aimed at establishing a sustainable program of high-quality organic chemistry research hubs on the basis of the organic chemistry community in Asia; since

then, Prof. Ruchirawat has kindly accepted the appointment as the coordinator of Thailand. Prof. Ruchirawat and I, along with other ACP coordinators, planned to realize and implement the idea through the annual conferences of the International Conference on Cutting Edge Organic Chemistry (ICCEOC) and lectureship awards given to selected individuals during each ICCEOC as invitations to carry out one-week lecture trips to the inviting member countries/regions. These main activities of the ACP have served as forums for showcasing research accomplishments of the chemists in the member countries/regions as well as networking among the participants to strengthen their relationships for future collaborations and research exchanges. As the coordinator of Thailand, Prof. Ruchirawat has launched the networking among Thai chemists while also securing generous supports from both NRCT and The Thailand Research Fund (TRF). The ICCEOC meeting was inaugurated as the 0th Conference in Nagoya University in March 2006 during which the general policy of ACP among 6 countries/regions was also approved. The 1st ICCEOC was held in Okinawa, Japan in October 2006 in which over 160 delegates from the 6 countries/regions participated. Her Royal Highness Prof. Dr. Princess Chulabhorn Mahidol graciously delivered an opening plenary lecture on Thai medicinal plants at this conference. She also gave illuminated keynote lectures at the 3rd ICCEOC in Hangzhou 2008, the 4th ICCEOC in Bangkok 2009, and the 8th ICCEOC in Osaka 2013. Over all these years, the ACP has continued to develop and benefit not only the senior ACP members but also the junior chemists including some outstanding Ph.D. students as the Junior ACP was subsequently established.[1] In fact, these have been made possible and met with great success thanks to the significant achievements of Prof. Ruchirawat in organizing those in the organic chemistry community in Thailand to participate in the annual ACP Conferences while establishing various international scientific collaborations. A number of ACP-triggered/initiated collaborative programs have been established in a bilateral manner with much success. He also contributed to improve the outcome of the ACP by kindly serving as an international advisory board member for over 15 years."

Apart from his interests in chemistry, Professor Ruchirawat enjoys classical music, ice hockey, and tennis. In addition, he also keeps abreast of information technologies. Professor Ruchirawat has been a role model for his peers and many generations of scientists, especially in the Thai community. His true passion for teaching and his caring nature has nurtured a number of scientists in Thailand to develop to their full potential. On this occasion of the 80th birthday, we both sincerely congratulate him on his success and his life-long contributions to the advancement of sciences. He has been not only a great teacher but also a compassionate mentor to many of us. It is our long hope that Professor Somsak Ruchirawat will continue enjoying life in good health and fostering the younger scientists for years to come.

Minoru Isobe

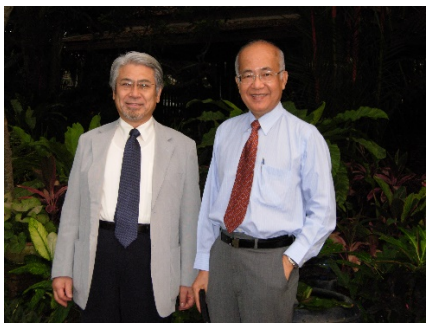
Professor Emeritus

Nagoya University

Poonsakdi Ploypradith

Senior Research Scientist II

Chulabhorn Research Institute



**Minoru Isobe** was born in 1944 in Nagoya, Japan. He received his Ph.D. in 1973 from Nagoya University and was a postdoctoral fellow during 1973-1975 at Columbia University. He has been appointed as Associate Professor (1975-1991), Professor (1991-2008), and Professor Emeritus (2008-present) at Nagoya University. He was also a Chair Professor at the National Tsing-Hua University during 2008-2014 as well as at the National Sun Yat-Sen University, both in Taiwan, during 2014-2015, a visiting professor at the Chinese University of Hong Kong in 2015, and a visiting professor at the Chulabhorn Research Institute during 2015-2016. He served as the President of the Organic and Biomolecular Chemistry Division of the IUPAC during 2004-2007. He was also the recipient of the Medal with Purple Ribbon (紫綬褒章) in 2008, the Princess Chulabhorn Gold Medal Award in 2011, and the Order of the Sacred Treasure (瑞宝中綬章) in 2018. His main research interest encompasses natural products chemistry, total synthesis, development of stereochemical control processes, bioluminescence, insect diapause, ultramicro analysis, protein phosphatase inhibition, and bioactive peptides.

**Poonsakdi Ploypradith** received his Bachelor of Arts (1994), Master of Arts (1996), and Doctor of Philosophy (1999) in Chemistry all from The Johns Hopkins University. During his graduate career, he worked under the guidance of the late Professor Gary H. Posner. Since 2000, he has started his independent career at Chulabhorn Research Institute and was promoted to Senior Research Scientist (equiv to assistant professorship) in 2009 and to Senior Research Scientist II (equiv to associate professorship) in 2015. Since 2007, he has also served as a lecturer at Chulabhorn Graduate Institute. His main research interest is the utility of reactive intermediates in organic synthesis including quinone methides, allenes, and carbocations as well as the applications of the developed methods in the total synthesis of natural products.

Note and reference:

1) Isobe, M.; Nishida, A.; Choo, Y.-M.; Rahman, N. A.; Ploypradith, P.; Ruchirawat, S.; Lin, G.-Q.; Li, A.; Yao, Z.-J.; Uang, B.-J.; Liao, C.-C.; Chiu, P.; Kim, B. M.; Loh, T. P. The Last and Next Decades of the Asian Core Program on Cutting-Edge Organic Chemistry in Asia. *Chem. Asian J.*, **2015**, *10*, 790-804.