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PREFACE

TO SPECIAL ANNIVERSARY ISSUE OF *HETEROCYCLES*

Honoring the 75th Birthday of Professor Keiichiro Fukumoto

Professor Keiichiro Fukumoto, the Editor of *Heterocycles*, was born in Shodo Island, Kagawa prefecture, on February 10, 1934. He graduated from the Pharmaceutical Institute, Osaka University in 1956 and obtained his Ph.D. degree from Osaka University in 1964, studying the synthesis of isoquinoline alkaloids, cularine, and related ones, under the guidance of the late Professor Tetsuji Kametani, the founder of *Heterocycles*. He was appointed Assistant Professor of the Pharmaceutical Institute, Tohoku University, in 1959, and promoted Associate Professor in 1972 and Professor in 1981. In 1997 he retired from Tohoku University and became Emeritus Professor. From 1964, he spent one year at the University Alberta with Professor S. Masamune and one year at the University of Sussex, with Professor A. I. Scott, as a postdoctoral fellow, respectively.

Professor Fukumoto has received a number of awards such as The Pharmaceutical Society of Japan Award for Young Scientists in 1976, The Academic Award of The Society of Synthetic Organic Chemistry, Japan, in 1993, The Pharmaceutical Society of Japan Award in 1997, and Medal of Honor with Purple Ribbon in 2000. He has contributed to the chemical community in the world in many ways; he has been the Editor of *Heterocyles* for a long period, after Professor Kametani passed away in 1988.

Professor Fukumoto's research interests have ranged widely over synthetic chemistry, in developments of novel synthetic methodologies and syntheses of biologically active natural products. He has synthesized over 200 natural products and published 633 scientific papers. I am going to give here a brief description of his selected research activities. His research career as an organic chemist started in 1955, and his first project was the synthesis of isoquinoline and indole alkaloids. He obtained his Ph.D. with the accomplishment of the total synthesis of cularine, as mentioned above. Until the early 1970s, his main interest was the synthesis of isoquinoline alkaloids via biomimetic approaches utilizing phenol oxidation, the modified Pschorr reaction, and so on. A number of isoquinoline alkaloids such as the morphine, aporphine, proaporphine, protoberberine, hasbanan, benzophenanthridine, sendaverine, and phenethylisoquinoline type alkaloids, *Erythrina*, *Amaryllidaceae* and *Ipecac* alkaloids, were totally synthesized. His books, "The Chemistry of the Isoquinoline Alkaloids, vols. 1 and 2", published with Professor Kametani in 1968 and 1974, respectively, contributed so much to the field.

The principle of 'Retro Mass Spectral Synthesis' that he proposed with Professor Kametani in 1974 was especially brilliant and fruitful. Various biologically active natural products such as steroids, diterpenoids, triterpenoids, protoberberine, phthalideisoquinoline, quinazolinocarboline, spiro-benzylisoquinoline alkaloids, indole alkaloids, and diterpene alkaloids, were elegantly synthesized. In paticular, the syntheses of estrone, (+)-estradiol, alnusenone, and friedelin using the intramolecular Diels-Alder reaction of benzocyclobutene, based on the principal, are outstanding. Applications utilizing pericyclic reactions of *o*-quinodimethanes developed by his group are regarded as a leading research in a modern synthetic chemistry.

As an extension of pericyclic reactions, he and his associates investigated the development of new cascade reactions, forming multiple bonds in a stereo- and regioselective manner in one procedure. The intramolecular double Michael reaction and the intramolecular Michael aldol reaction, elaborated by them, are useful tools for the synthesis of polycyclic natural products. The new methodologies showed many advantages, owing to the characteristic features of the intramolecular reaction and sequential sequences. The intramolecular double Michael reaction has been applied the syntheses of carbocyclic compounds as well as heterocyclic compounds. Unique polycyclic ring systems fused to cyclobutane were constructed efficiently by the intramolecular Michael aldol reaction. The methodology has been extended to new other types of cascade reactions by his associates.

In every respect, Professor Fukumoto has been a smart and productive chemist. Furthermore, he is outstanding human being and an excellent educator. We have always been stimulated to do our best for research by his encouragement.

Professor Fukumoto was a good baseball player when he was a high school student. With an attitude similar to sports, he has been at the forefront of research in new areas and has tackled the most difficult problems with the deepest insight. We all wish Professor Fukumoto a healthy and happy life with Mrs. Fukumoto.

Masataka Ihara, Ph.D.
Specially Appointed Research Head of Hoshi University
Emeritus Professor of Tohoku University
CSO of Synstar Japan Co. Ltd.

Masataka Ihara, Professor emeritus of Tohoku University, is currently a specially appointed research head at Hoshi University and CSO of Synstar Japan CO., Ltd. He was born in 1942 and graduated from Tohoku University in 1965. After obtaining his Ph. D. degree under the supervision of the late Professor T. Kametani in 1970, he was appointed Assistant Professor at Tohoku University. He spent postdoctoral years with Professor Sir A. R. Battersby at the Chemical Laboratory of Cambridge University during 1971–1974. He was then appointed as Associate Professor at the Pharmaceutical Institute of Tohoku University in 1981, promoted to Professor in 1997, and retired from Tohoku University in March 2006. He received The Research Foundation Award for Pharmaceutical Sciences in 1987, The Miyata Academic Prize in 1992, The Kametani Award in 2004, and The Pharmaceutical Society of Japan Award in 2005. His research interests include development of new synthetic methodology and medicinal chemistry. His main interest at Hoshi University is the development of anti-protozoal agents.