PREFACE

Shosuke Yamamura

Department of Chemistry, Faculty of Science and Technology, Keio University,
Hiyoshi, Yokohama 223, Japan

It is a great pleasure and honor for me to contribute the preface to this special issue which is dedicated to Professor Koji Nakanishi on the pre-celebration of his 75th birthday.

In March 1992, I was awarded the Chemical Society of Japan Award, which should be attributable to the kind guidance of Professors Yoshimasa Hirata (Emeritus, Nagoya University), Koji Nakanishi (presently at Columbia University), and George H. Büchi (Emeritus, MIT). Professor Hirata, the direct mentor of Professor Nakanishi and myself at Nagoya University, taught me how to locate and research challenging new problems. When I became a professor of Keio University, in particular, I decided to adopt a combination of two research concepts, which I had learned from Professors Hirata and Nakanishi. Professor Büchi also influenced me greatly in work on the synthesis of natural products based on his biogenetic concept. If I had not known Professor Nakanishi, I would have become a biochemist.

More than forty years have passed since I first met Professor Nakanishi in April 1956. Nakanishi-sensei (as I usually call him) was a brilliant, young teacher whose absorbing lectures fascinated and inspired me. He used the book "TEXTBOOK OF ORGANIC CHEMISTRY" by Louis F. and Mary Fieser of Harvard University. There he worked under Professor Fieser, gaining invaluable experience as related in "A Wandering Natural Products Chemist" in the series of Profiles, Pathways, and Dreams, Autobiographies of Eminent Chemists (J. I. Seeman Ed.).

In July 1957, I decided to join Hirata's group to study natural products chemistry. Since then, I worked for three years on the structural determination of monascoflavin , an yellow pigment of *Monascus purpureus* Wentii, under the direction of Nakanishi-sensei. When we stayed in the lab working on experiments until late at night, he used to wait for us and then take us to "yatai", a night street stall for a cup of "sake" over which we learned from him a lot of things about chemistry and other subjects. During my graduate course, Nakanishi-sensei moved to Tokyo Kyoiku University as a professor, then later to Tohoku University in 1963. There he worked on a number of interesting natural products until 1969.

Among them, from the structural and biological points of view, ginkgolides from the root bark of *Ginkgo biloba* L. and ponasterone from the leaves of *Podocus nakaii* Hay are quite important and attractive compounds. The ginkgolides are a highly oxygenated diterpene with a complex structure bearing a tertiary-butyl group which was first found in nature, and the stereostructure of ginkgolide A and related compounds was determined by the Nakanishi group using a combination of chemical and spectroscopic methods. In particular, this is the first example in which an impressive application of NOE was carried out for such a complex molecule as ginkgolides, the stereochemistry of which is completely identical with that

obtained by a Nagoya group using an X-ray crystallographic analysis. As has been well-known, recently, the extract of the ginkgo leaves, sells of which reach 2 - 3 billion dollars a year, is supposed to improve memory and concentration, and sharpen mental focus. Nakanishi-sensei said, "I take ginkgo tablets daily but there has been no immediate, obvious effect", which is as the case of Chinese traditional medicines. As described later, the leaves of the ginkgo tree are used in the design of The Nakanishi Prize medal.
Another exciting topic is ponasterone, which was fortunately found in the course of searching for antitumor substances in the leaves of *Podocarpus nakaii* Hay. The structure of ponasterone (ecdysterol) is completely identical with that of α-ecdysone except for the location of one hydroxyl group. As is well-known, α-ecdysone, the precursor of the universal molting hormones of insects, was first isolated from silkworms by Butenandt and Karlson. However, the obtained contents were very small. The first finding of phytoecdysones in large quantities by Nakanishi-sensei has contributed greatly to the development of insect physiology.
In August 1969, Nakanishi-sensei moved to Columbia University in New York. There he has been working on a wide variety of bioactive natural products including azadiractin as an insect antifeedant, warbungal with antifeedant activity, antheridigogen as the hormone that induces the formation of antheridium, brevetoxins from the dinoflagellate *Ptychodiscus brevis* Davis (the red tide), tunichromes from tunicate blood, philanthotoxin contained in the venom of the digger wasp, *Philanthus triangulum*, papavionins and mosesins as a shark repellent, andrimid from the eggs of the brown plant hopper, and others. Through these studies, Nakanishi-sensei has successfully collaborated with many scientists in an interface between chemistry and biology. Especially, everyone in the field of natural products chemistry and bioorganic chemistry knows his outstanding work on visual pigments including the fluorophore which accumulates in old eyes, wherein Nakanishi-sensei used his own developed exciton coupled CD method. The dibenzoate chirality method has been generally used for the determination of the absolute configuration. These notable results brought him a number of awards and honors including the Chemical Society of Japan Award (1979), , Imperial Prize of Japan Award (1990), A. C. Cope Award (1990), National Academy Sciences Award in Chemical Sciences (1994), and Robert A. Welch Award (1996).
In 1995, the Nakanishi Prize was established by the Chemical Society of Japan and the American Chemical Society. The prize will be awarded to recognize and stimulate significant work that extends chemical and spectroscopic methods to the study of important biological phenomena. The first Nakanishi Symposium on Natural Products and Bioorganic Chemistry was held on December 7, 1996 in Tokyo, and Professor Yoshimasa Hirata (Emeritus, Nagoya University) was awarded the Nakanishi Prize for 1996. The Nakanishi Symposium was also held on September 8, 1997 in Las Vegas, USA and Professor Frank Westheimer (Emeritus, Harvard University) was the first recipient of the Nakanishi Prize in the USA side. Perhaps it would have been difficult to find any others more fitting than these two eminent scientists to be the first recipients in the respective countries. It is my sincere hope that the Nakanishi Symposium will continue to be held in both countries, thus strengthening further the splendid and wonderful bridge over the Pacific between USA and Japan, that Nakanishi-sensei has constructed.
Let me close by sending my warmest congratulations and best wishes to Nakanishi-sensei.