Professor Shun-ichi Yamada (1915-1996)

Our respected mentor, Professor Shun-ichi Yamada, Professor Emeritus of the University of Tokyo, passed away on April 21, 1996, at the age of 80 of a heart disease.

Professor Yamada was born in Osaka in 1915 and studied at the Pharmaceutical Institute, Faculty of Medicine, Tokyo Imperial University. Upon graduation in 1940, he joined a company to work as an organic chemist, but was drafted into the Navy as a pharmaceutical officer in the same year. He underwent extremely arduous experiences during World War II, and was able to return to Japan in November, 1945. He then joined Tanabe Seiyaku Co., Ltd., one of the leading pharmaceutical companies in Japan, and started to synthesize compounds of medicinal interest. From 1949, he and his group started to work on the synthesis of various α-amino acids for use in transfusion. Since only *L*-amino acids have nutritive values, they studied various methods to resolve racemic amino acids, and finally established an industrial method for the synthesis of optically active amino acids, such as *L*-methionine, *L*-lysine, *L*-tryptophan, and *L*-phenylalanine using acylase from *Aspergillus oryzae*. This method was actually employed for the commercial production of nutritive solution for transfusion.

With this experience, Professor Yamada recognized that enantiomers are different compounds from each other in the living world, and that the targets for the synthesis of chiral biologically active compounds should not be racemic but optically active compounds having the desired absolute configurations.

In 1959, Professor Yamada resigned as director of Tanabe Seiyaku Research Laboratories (Tokyo branch) to become a professor at his alma mater, and developed novel methods for the synthesis of many chiral natural products and biologically active compounds in optically active forms, using optically active amino acids as chiral sources as shown in Figure 1. His pioneering works include a general synthesis of optically active α-substituted carbonyl compounds *via* the alkylation of proline-derived enamines, a biogenetic-type asymmetric synthesis of alkaloids, biomimetic asymmetric reductive transaminations and imine alkylations, catalytic asymmetric epoxidations of allylic alcohols, new coupling reagents for peptide synthesis, and numerous absolute configuration determinations that have clarified the stereochemical and mechanistic features of many carbon-carbon and carbon-nitrogen bond-breaking and bond-making reactions.

In 1983, Professor Yamada founded the Japan Research Foundation of Optically Active Compounds to support and encourage young Japanese chemists in this research field. He organized the Symposium on Optically Active Compounds, which has been held annually at Tokyo since 1990. Since 1995, the Yamada Prize has been awarded every year to a scientist whose research has had a major impact in the field of the synthesis of optically active compounds. The Yamada Prize winners are Professor Dieter Enders (1995), Professor Albert I. Meyers (1996), and Professor David A. Evans (1997).

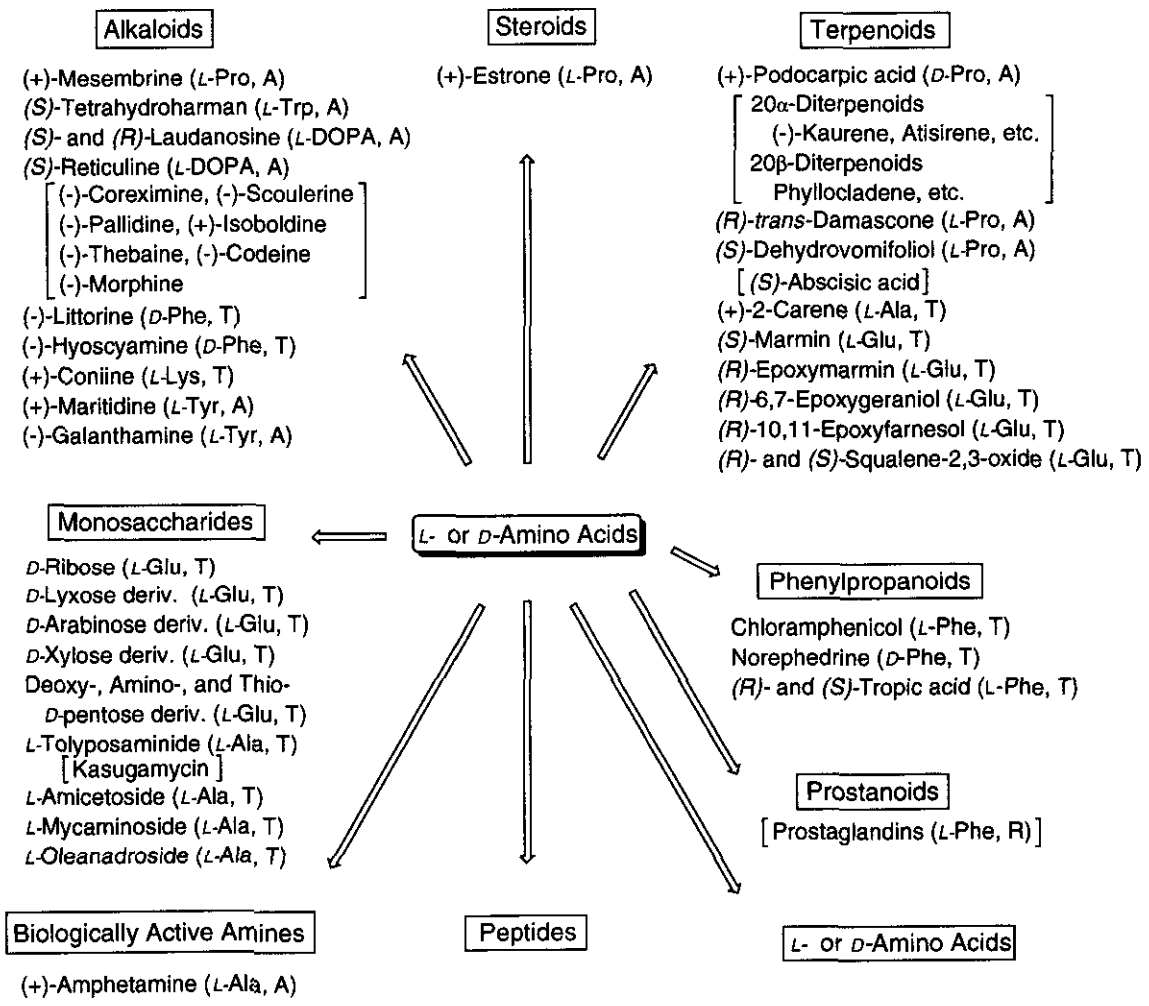

Figure 1. Natural products and biologically active compounds synthesized by Professor Yamada.
In round-shaped parentheses, amino acid used and the methods (A: asymmetric synthesis; T: chemical transformation; R: resolution) are indicated. In hook-shaped parentheses, compounds that were synthesied formally are indicated.

Professor Yamada's contributions to the chemistry of optically active compounds have been widely recognized and honored. For example, he received the Pharmaceutical Society of Japan Award in 1975, Naito Foundation Research Prize in 1978, and Japan Academy Prize in 1995. A book (Asymmetric Synthesis, Vol. 4, edited by J. D. Morrison and J. W. Scott, Academic Press, Inc., New York, 1984) and an issue of *Tetrahedron* (1993, **49**, No. 9) are dedicated to him.

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