

## **Bio-organic Studies on the Biosynthetic Key Reactions Generating Structural Diversity of Natural Products**

Yutaka Ebizuka

(Graduate School of Pharmaceutical Sciences, The University of Tokyo)

Even today and in the foreseeable future, natural products are expected to be the most promising source for useful chemicals such as pharmaceuticals, food additives, agrochemicals and so on, because of their huge variety of structures and thus of biological activities. The diverse structures of natural products are elaborated by biosynthetic pathways with multi-step enzyme reactions, and those biosynthetic enzymes which work at the most upstream of pathways are thus regarded as the primary origin of structural diversity exhibited by natural products. These enzymes, in general, take up rather common and ubiquitous substrates supplied from the primary metabolism. However, even when they show significant sequence homology each other, their substrate and/or product specificities often vary, in some cases dramatically, depending upon the nature of each enzyme. Our attentions have been focused on these biosynthetic enzymes for future engineering of rationally designed biosynthetic machineries for production of new chemicals of pharmaceutical importance.

In the presentation, recent progress in the bio-organic studies, including molecular cloning, functional identification, reaction mechanism, rational specificity alteration, and etc, on those enzymes involved in the construction of fundamental carbon frameworks of fungal polyketides and plant triterpenoids will be discussed.