

Principal Researcher	Yutaka Ebizuka			Number of Researchers	3	
Research Institution • Department • Title	Professor, Department of Chemistry and Biological Chemistry, School of Pharmaceutical Sciences, The University of Tokyo			Location of Institution	Tokyo	
Title of Project	Functional Genomics Approach to Exploiting Molecular Diversity					
Abstract of Research Project	<p>Natural products constitute a huge library of complex chemical structures with various profound biological activities, and thus have served as an invaluable source for useful chemicals, ranging from pharmaceuticals, agricultural chemicals, to flavors and pigments. Diverse structures of natural products are elaborated by biosynthetic enzymes showing unique functions that can not be found in primary metabolism. In this study, the efficient gene cloning of such enzymes for polyketides and triterpenoid biosynthesis will be attempted from various sources including some model organisms, such as <i>Arabidopsis thaliana</i> and <i>Streptomyces coelicolor</i>, whose entire genome sequences are now available. Detailed analysis of their protein structures and enzyme functions will enable the rational design and generation of artificial enzymes with altered functions. By recombinant technology of these enzymes, development of practical production system for useful chemicals and construction of artificial chemical library comprising of “un-natural natural products” with diverse structures will be further attempted.</p>					
References	<p>(1) Tetsuo Kushiro, Masaaki Shibuya, Kazuo Masuda and Yutaka Ebizuka, Mutational Studies on Triterpene Synthases. Engineering Lupeol Synthase into b-Amyrin Synthase, <i>J. Am. Chem. Soc.</i>, 122, 6816-6824 (2000).</p> <p>(2) Isao Fujii, Akira Watanabe, Ushio Sankawa and Yutaka Ebizuka, Identification of Claisen Cyclase Domain in Fungal Polyketide Synthase WA, a Naphthopyrone Synthase of <i>Aspergillus nidulans</i>, <i>Chemistry and Biology</i>, 8, 189-198 (2001).</p>					
Term of Project	Fiscal years 2003-2007 . (5years)					
Budget Allocation (in thousand of yen)	FY2003	FY2004	FY2005	FY2006	FY2007	TOTAL
	15,400	29,300	9,000	9,600	9,900	73,200
Homepage Address	http://www.f.u-tokyo.ac.jp/~tennen/head.htm					