

Preface

The year 2012 celebrates the 50th anniversary of the first publication on cytochrome P450 (P450) by Tsuneo Omura and Ryo Sato, “A New Cytochrome in Liver Microsomes,” in *The Journal of Biological Chemistry* (237:1375–1376) in 1962. Fifty years of research on P450s have revealed that many forms of P450 exist in animals, plants, and microorganisms. Research on P450s has expanded into many different fields ranging from molecules to human bodies by attracting biochemists, structural biologists, and pharmaceutical/medical researchers. P450s have drawn the attention of industry for bioengineering applications such as drug development as well as the creation of the “blue rose” as a new product. The basic catalytic mechanism of P450 is the activation of oxygen to a reactive form in a complex cycle (see Fig. 2.1). The research on nuclear receptors, which has extended outward from the research on the regulatory mechanisms of the P450 genes, has become a very important area in biology, medical science, pharmacology, and/or clinical medicines. P450 research has developed tremendously, from the early studies with rat livers to personalized medicines for individual patients in the twenty-first century (for a timeline of major discoveries, see Fig. 3.1).

One of the authors of that first article in *The Journal of Biological Chemistry*, Dr. Tsuneo Omura, now Professor Emeritus, Kyushu University, is actively reviewing a variety of research areas that have flourished with P450s to date. The readers of this book will find in the Epilogue a special letter from the editors of *The Journal of Biological Chemistry* to Dr. Omura with remarks on the 50th anniversary of this seminal work. It should also be noted that the contribution of researchers in this field worldwide has been significant in the last 50 years. Taking the unique opportunity provided by this 50th anniversary, a scientific symposium was conducted with leading scientists around the world in Kyushu, Japan, in December 2012 (Fig. 1).

The success of the research has had tremendous implications in fields such as medicine, agriculture, and biotechnology. The planning for this book was in three parts: to collect a comprehensive coverage of major progress, to discuss future



Fig. 1 Participants at the 50th Anniversary Symposium on P450 in Fukuoka, Japan, held December 2–3, 2012

directions of the research on P450s, and to invite young researchers to join this important and exciting world of P450. I hope that this book will encourage many young students and postdocs in P450 research to try new approaches, and as an editor I will be greatly pleased if our book can support their research work.

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