Biomimetic Chemistry

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PREFACE

The interdisciplinary areas between the traditional inorganic and organic divisions of chemistry and those of biochemistry have seen a remarkable growth in the past few years. This increase in interest and effort has been marked by the establishment of new journals in these areas.

Just as in the past when the artificial divisions between chemistry and biochemistry became indistinct, so more recently have the boundaries between bioorganic and bioinorganic chemistry. Indeed, investigators in these fields need, of necessity, to be well versed in all of these disciplines, and it is appropriate that Breslow coined the term "biomimetic" to describe those endeavours that include all areas relating to our understanding of the processes, enzymatic and otherwise, controlled by nature.

Of major importance to biomimetic studies have been the development of model systems that mimic the natural ones. Indeed, the basis for our understanding of coenzyme functions stems primarily from such studies with model systems. We can anticipate for the future, and the reader will see in the pages of this monograph, promise of the ability to understand and parallel in vitro the specificity and catalytic acceleration of enzymes themselves.

Areas of biomimetic chemistry relating to enzyme systems that function both with and without the benefit of coenzymes are included. Special emphasis has been placed on the following subjects: vitamin B_{12} and flavins; oxygen binding and activation; bioorganic mechanisms; and nitrogen and small molecule fixation.

Biomimetic chemistry not only provides means of elucidating enzyme and coenzyme functions through manipulation of model systems, but also opens a way to the development of novel polyfunctional catalysts and materials that may or may not exist in nature. On the basis of the advancement of research described in this book, we now stand on the edge of an interdisciplinary valley so that the jump beyond the mimetic chemistry becomes possible in the future.

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