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Preface

D-Amino acids, in particular unnatural ones, are found to be useful for production of various therapeutic agents and enzymes from microbial sources are finding numerous industrial applications. For example, a major part of world-wide production of D-*p*-hydroxyphenylglycine as a component of amoxicillin is manufactured by means of bacterial D-hydantoinase and *N*-carbamoyl-D-amino acid carbamoyl-hydrolase. Extensive studies are being done to find out new enzymes that are applicable to the industrial production of D-amino acids.

Similarly, biochemistry of D-amino acids has made great progress in the last several years especially after the discovery that high concentrations of D-serine are present in mammalian forebrains and that D-aspartate is accumulated transiently in brains at particular stages of development. More important discoveries have followed them: D-serine acts as an agonist at the glycine site of *N*-methyl-D-aspartate (NMDA) receptor, while D-aspartate serves as an agaonist at its glutamate site. The patterns of regional variation and postnatal changes in brain D-serine are found to be closely correlated with those of NMDA receptor. Thus, D-serine is now believed to be an intrinsic modulator of NMDA receptor through the findings, for example that D-serine administered to an antipsychotic regimen shows significant beneficial effects on cognitive function and performance. Recently, serine racemase was purified to homogeneity from rat brain and its cDNA was also cloned. D-aspartate is also synthesized in mammalian cells, although the enzyme involved (possibly aspartate racemase) has not been identified yet. Now it is clear that D-aspartate plays a pivotal role in the biosynthesis of hormones in secretory glands such as pineal and pituitary bodies.

This special issue of *Journal of Molecular Catalysis B: Enzymatic* is a collection of articles concerning current topics in the field of chemistry and biochemistry of D-amino acids written by outstanding researchers in this field. We hope this issue provides the readers fun of this exciting field.

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