Preface

Welcome to the first special issue of “Carbohydrates Therapeutics of the Future” dedicated to new developments in carbohydrate drug design. The first of this series deals with various implications of the effects of carbohydrates on specific diseases and their potential as valuable candidates of carbohydrate drugs.

During the last decade, considerable progress has been made in carbohydrate research. Synthetic chemists, particularly in medicinal and pharmaceutical chemistry, have also embraced this progress thereby creating new opportunities for the development of carbohydrate drug design. Current biological functions of carbohydrates, especially in the new field of glycobiology, and discoveries of new biological functions, have had a direct impact on a diverse group of biological studies from cancer to diabetes and cell-cell adhesion in inflammation and metastasis.

The following collection of reviews, presented by internationally recognized scholars, offers a stimulating account of the rapidly challenging field of carbohydrate chemistry.

The first review article deals with the “Synthesis and Applications for Unnatural Sugar Nucleotides” contributed by Professor Kevin Rice and Jordan Elhalabi. The specificity of glycosyl transferases for both unnatural sugar donors and acceptors is elegantly presented.

Dr. David Newburg reviews the exciting area of research into a “Human Milk Glycoconjugates that Inhibit Pathogens.” These natural oligosaccharides are new therapeutics that promise treatment of specific genetic carbohydrate metabolic diseases.

Professor Jacquelyn Gervay and Katherine D. McReynolds bring us up to date on extremely important efforts of “Utilization of ELISA Technology to Measure the Biological Activities of Carbohydrates Relevant in Disease States”.

The Professor Peng George Wang’s group reviews the new syntheses of “α-Gal Oligosaccharides: Chemistry and potential biomedical applications”.

Finally, since thio-sugars are the innovative leads of carbohydrate drug design, it is worthy to include in this issue “Thiosugars: Biological Relevance as Potential New Therapeutics”.

I hope researchers in both academic and industrial laboratories find this first issue informative and useful, especially those who are interested in staying abreast of innovations in the carbohydrate drug design field.1-2

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