# Preface

RNA has previously been categorized into transfer RNA (tRNA), ribosomal RNA (rRNA), and messenger RNA (mRNA). However, the concept was subsequently rewritten with the discovery of self-replicating viral RNA, shortly followed by ribozyme and nuclear RNA. It was then predicted that there was a large assortment of small RNA species, known as sRNAs, in cells with obscure and novel functions but at the time was not been identified (Guo et al. Science, 1987, 236:690-4. A small viral RNA is required for in vitro packaging of bacteriophage phi 29 DNA). The implication of potential application of small interfering RNA (siRNA), microRNA (miRNA), ribozyme, aptamer, riboswitch, antisense RNA has enhanced the visibility of and stimulate interest in the RNA. Likewise, the field of RNA nanotechnology was proven in 1998 with the controlled self-assembly of RNA nanorings from multiple copies of Phi29 bacteriophage packaging RNAs. Witnessing the growth in the field of RNA nanotechnology, it was predicted in 2014 that RNA as either a drug or drug target will become the third milestone in the pharmaceutical industry. The approval of several RNA drugs by FDA, the widely used mRNA vaccine for the prevention of COVID-19 pandemic, the popular diagnosis of COVID-19 using viral RNA has evidenced the coming of the third milestone in drug development using RNA.

Since the first edition of this book *RNA Nanotechnology and Therapeutics* that reports the emergence of RNA nanotechnology, the field of RNA nanotechnology has boomed and advanced rapidly with many exciting new findings. The large volume of literature in RNA nanotechnology and therapeutics necessities an update of the book *RNA Nanotechnology and Therapeutics* as the second edition.

The intended style of this book is one that can engages researchers from undergraduates all the way to post-doctoral researchers and professors, in engineering and other sciences to further enhance this field. It is imperative that we work together to propel it to all that it can be, and more.

We are delighted to present this book and hope that readers will find it very resourceful and as exciting as we do.

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