



Nucleic Acids Nanoscience at Interfaces Special Issue


The growth in the field of nucleic acids nanoscience since the early work of Ned Seeman and colleagues exemplifies scientists' increasing confidence and skill in repurposing natural molecules for decidedly unnatural ends. The inherent programmability of sequence-defined polymers based on DNA, RNA, and their synthetic analogues combined with the efficient automated synthesis (and commercial availability) of these compounds presents a very low barrier to entry into the field. This has unleashed a wave of creativity in the design, assembly, characterization, and application of nucleic acid nanostructures.

This special issue of *Langmuir* focuses on the latest developments and provides a look into the future of nucleic acids nanoscience, particularly as it concerns the understanding and exploitation of interfacial phenomena. As Irving Langmuir once said, "The scientist is motivated primarily by curiosity and a desire for truth". Thus, our goal in assembling this issue was to highlight the importance of fundamental science in driving the field forward (hence, the selection of the term "nanoscience" as opposed to "nanotechnology"). The issue contains 3 Invited Feature Articles and 45 Research Articles on a diverse set of topics involving both long-time entries (e.g., DNA-coated gold nanoparticles) and more recent arrivals (e.g., DNA origami nanostructures), and from the construction of ever more complex and functional nanostructures to the enhanced detection thereof in manifold ways.


This is an important time for the field, with increasingly sophisticated designs bringing within reach what were once far-fetched applications. These advances require a firm understanding of the interfacial properties of the system, whether referring to how the nanostructure assembly is solvated by water and ions or how its properties change upon immobilization on a surface. *Langmuir's* emphasis on science at the interface makes it the ideal home for such an overview of the field.

Few fields of research combine whimsical "what if?" experiments, rigorous fundamental studies, and timely applications to the degree that nucleic acids nanoscience has done for more than 30 years. We hope that this special issue helps both experienced practitioners and eager neophytes to appreciate the opportunities represented by an interfacial perspective, both philosophical and physical, of this burgeoning field.


We conclude by thanking all the authors, reviewers, and editorial assistants who helped to realize our vision for this special issue. Finally, we hope that you, the reader, find this collection of articles to be enlightening and inspiring.

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Notes

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