Editorial note for the special topic on “Nanopore Analysis”

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The concept of nanopore analysis, using the pore-forming protein α -hemolysin to detect individual nucleic acids at a single-molecule level, was first proposed in 1996. Over the past two decades, tremendous progress has been made in the nanopore field, and nanopore analysis has become a label-free and high-throughput method for probing biomolecules and other analytes with single-molecule sensitivity, especially holds the promising for “third generation” DNA sequencing. However, challenges still remain in the experimental strategies and the design of whole nanopore-based instruments. Here, we proudly present a special topic dedicated to the topic of “Nanopore Analysis”, with 8 reviews/articles providing up to date coverage of the experimental strategies, theoretical calculations and simulations, and instrument design. Reviews and articles on the experimental strategies cover control of DNA partitioning into a nanopore, detection of target

DNA, and the advantages of nanopore-based DNA sequencing. The theoretical calculations and simulations discuss the translocation behavior of DNA, and an integrated measurement system and data analysis software are presented for instrument design.

We believe that this topic is representative of current work in the field of nanopore analysis and demonstrates the continuing efforts made by Chinese researchers. We predict that Chinese researchers will make important contributions to this field, which will push this technology toward becoming a routine analytical tool, even approaching the goal of affordable and personalized devices for DNA sequencing. We hope this topic will provide readers with a thorough overview of nanopore techniques. We would like to take this opportunity to thank all the authors for their great contributions.

SPECIAL TOPIC: Nanopore Analysis

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