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Structural DNA Nanotechnology for Educational Laboratories

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Due to the complexity and cost of materials and equipment, structural DNA nanotechnology is limited to research laboratories with expertise in the area that can afford expensive material and equipment. We believe that by removing the need for expensive equipment, students can be exposed to an advanced area of research while meeting valuable educational milestones in fields such as chemistry, biology, biophysics, biological engineering, and materials science. To that end, we have developed four experiment modules that focus on assembling, characterizing, and understanding the design and function of DNA nanodevices. These modules are designed without the need for specialized equipment, allowing students to fold and analyze DNA nanodevices within a 90-minute class period using standard equipment such as hot plates or water baths and a Minione gel electrophoresis system, which is well-suited for classroom implementation. Participants in this workshop will learn basics of DNA nanostructure assembly and engage in a condensed version of an experiment module where they will fold a DNA nanostructure in a self-assembly reaction. We have recently successfully piloted this condensed module in a local 6th grade classroom demo.

Keywords: DNA nanotechnology

Mission, Review Process & Disclaimer

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