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DNA detection using Laser Transmission Spectroscopy¹ CAROL TANNER, STEVEN RUGGIERO, FRANK LI, University of Notre Dame, ANDREW MAHON, Central Michigan University, MATTHEW BARNES, SCOTT EGAN, JEFFREY FEDER, DAVID LODGE, CHING-TING HWANG, ROBERT SCHAFFER, University of Notre Dame — Laser transmission spectroscopy (LTS) is a new quantitative and rapid technique for measuring the size, shape, and number of nanoparticles in suspension. We report on the application of LTS as a novel detection method for species-specific DNA detection where the presence of one invasive species was differentiated from a closely related invasive sister species. The method employs carboxylated polystyrene nanoparticles functionalized with short DNA fragments that are complimentary to a specific target DNA sequence. In solution, the DNA strands containing targets bind to the tags resulting in a sizable increase in the nanoparticle diameter, which is rapidly and quantitatively measured using LTS. DNA strands that do not contain the target sequence do not bind and produce no size change of the carboxylated beads. The results show that LTS has the potential to become a quantitative and rapid DNA detection method and have additional applications for point-of-care medical diagnostics.

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Prefer Oral Session
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