

Tracking bacterial growth conditions with arrayed supramolecular assemblies for application in microbial forensics

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Microbial detection and identification continues to be an important area of research with applications to medicine, food and water safety, and biosecurity. The field of microbial forensics utilizes microbiological and physical characterization techniques to track pathogens by their source and environmental history. Growth medium, temperature, pH, and similar factors are known to significantly affect the membrane lipid composition and lipopolysaccharide (LPS) composition of gram-negative bacteria. We have recently employed an array of supramolecular assemblies which demonstrate the ability to discriminate between *E. coli* cells grown under different temperature and media conditions. These assemblies consist of a cationic fluorophore known as FPF and anionic FAM-labeled single stranded DNA oligomers, and are held together by electrostatic and hydrophobic forces. Forster resonant energy transfer (FRET) between FPF and FAM fluorophores is disrupted upon binding to an analyte such as a cell surface, and produces a shift in the fluorescent emission spectrum. Different complexes are prepared by the use of different ssDNA oligomers, and the array offers differential response to analytes which we successfully used to profile *E. coli* cells by growth conditions.

Biography

Mello received her Ph.D. in 1991 from the University of Massachusetts, Lowell. She is currently the technical lead for Biological Sciences at the U.S. Army Natick Research, Development and Engineering Center. In addition, Dr. Mello holds a Visiting Scientist appointment at MIT and is an Adjunct Professor in the Departments of Chemistry and Bioengineering at the University of Massachusetts, Dartmouth. Her research interests have centered on the interaction of proteins and peptides with themselves and other systems in their surroundings; research results have been presented in over 75 technical articles in scientific journals, nine patents, and numerous technical presentations.

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