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Uses of Chip-based Micro Bead Modules to Hybridize DNA

Erin Persil*

Department of Organic Chemistry, University of Murcia, Spain

Editorial

The construction of tiny complete analysis systems that incorporate sample preparation and measurement stages into microfabricated fluidic devices has been a recent trend in analytical chemistry. Reduced sample and reagent use, quicker analysis time, improved sensitivity, portability, and disposability are all possible advantages of lab-on-a-chip systems over traditional macroscopic apparatus.

Chip-based enzyme tests, 6 immunoassays, and DNA sequencing have all demonstrated these benefits. The most sophisticated and remarkable demonstrations in the lab-on-a-chip field have arguably revolved on tiny capillary electrophoresis devices with multiplexed separation lanes and ultrafast and orthogonal separations performed. The development of multiplexed detection techniques that could be utilised in combination with these lab-on-a-chip devices has received little attention.

Similarly, the development of miniaturised chip-based platforms capable of analysing several analyte classes is a key issue for future sensor research. Microfluidics research has sparked significant advances in the genomics sector during the last decade. As scientists attempt to understand the genetic basis of numerous diseases, the development of sequence-specific DNA detection methods has become increasingly crucial. While the polymerase chain reaction is used in the majority of contemporary DNA detection technologies, methods for detecting particular sequences in an array format are still being developed.

Commercially accessible technologies include Affymetrix19's oligonucleotide arrays and Motorola's DNA arrays with electrochemical transduction. While these systems have been tremendously effective in furthering genomics research, their applicability in many other applications has been restricted due to long hybridization durations and inefficiencies in lithographic processing. In general, the usage of planar DNA microchip architectures leads in short effective signal-generating channel lengths, necessitating either high-power light sources for chip reading or amplification approaches that delay analysis times.

Clearly, the scientific community has a significant problem in developing new high-sensitivity and high-selectivity platforms for the quick and direct detection of oligonucleotides. Platforms that go beyond planar DNA microchips and add a three-dimensional element into the sensor have made progress toward better sensitivity arrays. These second-generation DNA chips offer a medium that enables for a substantially greater density of probe attachment.

Acrylamide and agarose gel pad arrays on glass substrates are examples of such platforms. Furthermore, Walt and colleagues have proved the power of bead-based arrays when used in conjunction with optical fibres. 24 At a high temperature, single-base-pair mismatch discrimination was accomplished using DNA-functionalized poly divinylbenzene microspheres.

While the adoption of a nonplanar capture mechanism improves the sensitivity of these second-generation devices, the delayed delivery of analyte to the active regions remains an issue for these systems. The kinetics of DNA hybridization can, however, be influenced to some extent by pushing analyte movement through a sensor. Nanogen, for example, uses electrophoresis on a chip surface to increase signal kinetics. To take full use of these promising new microanalysis methods, more advancements in mass transfer and fluid mixing effects are clearly necessary. We provide a novel microbead array-based technology for the fast detection of oligonucleotides at ambient temperature.

To increase reaction speeds, hybridization, and discrimination qualities, this approach combines the benefits of second-generation sensor arrays with pressure-driven fluid flow and recirculation capabilities. This research builds on previous work that recognised and quantified acids, metal cations, proteins, antibodies, carbohydrates, and biological cofactors using the same "electronic taste chip" platform. The integration of functional DNA assays to the electronic taste chip system is another significant step toward making the device a universal chemical and biological detection platform [1-5].

Conflict of Interest

None.

References

1. Su, Liang, Wenzhao Jia, Changjun Hou, and Yu Lei. "Microbial biosensors: a review." *Biosens Bioelectron* 26 (2011): 1788-1799.
2. D'souza, S.F. "Microbial biosensors." *Biosens Bioelectron* 16 (2001): 337-353.
3. Dolatabadi, Somayeh, and D. Manjulakumari. "Microbial biosensors and bioelectronics." *Res J Biotechnol* 7 (2012): 102-108.
4. Wood, Keith V., and Monika G. Gruber. "Transduction in microbial biosensors using muliplexed bioluminescence." *Biosens Bioelectron* 11 (1996): 207-214.
5. Dai, Chunhui, and Seokheun Choi. "Technology and applications of microbial biosensor." (2013).

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***Address for Correspondence:** Erin Persil, Department of Organic Chemistry, University of Murcia, Spain, E-mail: epersil@odu.edu*

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