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Microstructure and Microdomain Microarrays

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Inventors

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Invention Description

Microarrays are commonly used in the analysis of an analyte or a mixture of analytes for the purposes of identification and quantification, as well as to characterize their physical and chemical properties. For example, DNA microarrays are often used to identify the presence or amount of specific gene transcripts or other specific nucleic acid sequences.

Microarrays are often constructed through sequential, position-specific, deprotection reactions performed on chemical side groups, followed by the addition of new, appropriately protected, chemical moieties by a specific reaction with the deprotected group. The low concentration of reactive sites on typical microarrays, however, is problematic for synthesis and detection. Continuing interest in creating new biopolymers and libraries composed of these biopolymers necessitates new methodologies for synthesizing them.

Researchers at the Biodesign Institute of Arizona State University have developed a method to synthesize biopolymer arrays (peptide, carbohydrate, DNA, RNA) on porous polymer materials. This affords a much higher concentration of the resulting biopolymers at a site and can dramatically improve the overall performance of the microarray.

Using MALDI-TOF mass spectrometry, the inventors have also discovered a way to identify the biopolymer that was synthesized at a specific spot. The technology not only allows for synthesis of unique compounds, but also provides for direct characterization of the array.

Potential Applications

- Enhancement of microarray technology
- Better diagnostic tools
- Drug discovery
- Sensor development

Benefits and Advantages

- Versatile: the synthesis of high-density, unique biopolymers can be applied to many biomedical applications
- High yield: high surface area of porous polymer provides a high number of internal reactive sites

Intellectual Property Status:

Patent Pending

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