Liquid Supramolecular Nanostamping
Technology #12269

Applications

- DNA microarray manufacturing
- Disease diagnostics and personalized gene therapy
- End user applications: research and development tool
- Drug discovery and development

Technology

This method of supramolecular nanostamping enables master microarrays to be replicated at a higher volume and manufactured at a higher rate. The technology consists of master microarrays containing 16 dots, each containing a large number of single stranded DNA (ssDNA) molecules aligned in upright positions that stand in rows. Complementary DNA (cDNA) in solution is chemically modified with "adhesion" thiol groups that help the strand stick to a silicon or gold substrate. After the master microarray is immersed in the surface adhesion solution, cDNA strands attach to strands in the master microarray, forming double stranded DNA (dsDNA) with sticky ends facing up. A gold piece is then laid on top of the upright molecules. The complex between the dsDNA and the gold microarray substrate is then heated to 80°C, unzipping the DNA. After pulling away the gold microarray substrate, the remaining surface is spotted with ssDNA that is a mirror image microarray of the master. By repeating the process just described on the mirror image, a mirror image of the mirror image may be formed, generating a rough copy of the master microarray. Therefore, in fewer steps, this method rapidly manufactures and replicates a DNA microarray.

Advantages

- Enables rapid DNA microarray manufacturing
- Only few steps involved
- Enables a high volume of identical DNA microarrays to be manufactured

Categories For This Invention:

- Life Sciences
- Diagnostics
- Microarray
- Research Tools
- DNA

Intellectual Property:

Liquid Supramolecular Nanostamping (LiSuNS)
Issued US Patent
8,383,339
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Publications:

Supramolecular Nanostamping: Using DNA As Moveable Type
Nano Letters
2005, 5 (6), pp 1061–1064

Image Gallery: