

Analytical technology developments for genomics

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Assessment of large numbers of genes, functional relationships between gene products, and the influence of environmental factors on biological activity require significant advances in analytical technology. Microarray technology takes advantage of miniaturization and parallel analysis for collecting this genomic-based information. Arrays are useful for characterizing genotypes, expressed genes, and protein interactions. Overviews of these microarray applications will be presented with an emphasis on the associated analytical requirements. Highlighted will be developments in ink jet based liquid handling and automated sample preparation. Key to the success of genome-scale analyses is technology that exploits the benefits of miniaturization. The ultimate reduction in scale occurs at the length scale of atoms and molecules. The emerging scientific field of nanotechnology addresses this length scale and is poised to provide new technologies for characterizing biological systems. Recent developments in the use of scanning probe microscopes and vertically aligned carbon nanofibers for applications in genomics will also be presented.