

P-4 (Plenary)

The Role Microfabrication in the Coming “Century of Biology”

D. Jed Harrison

Dept. of Chemistry, University of Alberta

Microfabrication methods, borrowed from the integrated circuit industry, have been used to micromachine extraordinary physical microstructures. Microchemical instrumentation can be designed on a chip using this technology in order to perform biochemical reactions or manipulate biological cells in nano and picoliter volumes. New, miniaturized instrumentation capable of a high level of automation and rapid analysis for the performance of clinical assays, genetic analysis, drug screening, and chemical analysis can be achieved with these devices. The demand of the life science community for gene and protein analysis and information will grow exponentially as our ability to understand and manipulate the genome and the proteome grows. Microsystem devices for fluidics, i.e. microfluidic devices, will play a key role in enabling this growth. However, the microfabrication methods will need to be extended well beyond standard integrated circuit processes, due to the drastically differing demands of biological and biochemical measurements. For example, microfabrication in plastic will become very important. These needs will place considerable demands on materials science and IC processing technologies.

