Trend of Plastic Technology for Biotechnology

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Micro-Electro-Mechanical System (MEMS) is a miniatuarized fabrication technology with micrometer or milimeter scale on the basis of semiconductor processing technology. Recently, the development of diagnosis and detection in the environmental, medical, and pharmaceutical fields has been attributed to the application of MEMS, which would contribute to the health care and biotechnology. These technological outcome is due to the combination of MEMS with biotechnology (Bio-MEMS) and the combination of Nano-Electro-Mechanical System (NEMS) with biotechnology (Bio-NEMS).

Biochip is a kind of analysis instrument that takes advantage of Bio-MEMS. The concept of biochip includes manufacturing, instrumentation, and application technology that is able to carry out rapid analysis of biomolecules. The use of biochip using DNA makes it possible to reduce the time required to analyse genetic sequence and diagnose genetic disease. These minitualization processing shows the way of integration of complicated biological experiments such as sample transfer, pretreatment, separation, and mixing.

In this study, Bio-MEMS structure composed of polymer, its state-of-the-art for the application to diagnosis and environmental analysis, market trend are introduced. The challenge of LG-Elite with respect to the biotechnology is as follows.

- DNA chip and detection using electrochemical luminescence mechanism
- Detection of antigen-antibody binding using Si-microbalance
- Development of biochip using microarray technology
- Future challenge for the development of biochip