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**Nanobiodevices for fast DNA separation and detection toward nanopore-based DNA sequencing** NORITADA KAJI, TAKAO YASUI, YOSHINOBU BABA, Nagoya University — There is an increasing demand for using micro- and nanofabricated structures as tools for separation, manipulation, detection and analysis of biomolecules such as DNA and proteins. So far, we have developed fabrication techniques for constructing several types of nanostructures on quartz substrate for biomolecules separation, e.g., nanopillar and nanowall array structures, and demonstrated their analytical performances. Some important findings were that the nanopillar array pattern could control the DNA separation mode and electroosmotic flows in the nanopillar array structures were reduced according to the nanopillar spacing. Since these small confined nanospaces are suitable for manipulating biomolecules at a single molecule level, several approaches have been tried to analyze DNA denaturation and DNA-protein interactions in parallel. However, it is difficult to say that the observed phenomena reflect an intrinsic DNA property or DNA-protein interaction manner because all these approaches requires fluorescently labeled DNA molecules for observation. To address these issues, we are trying to develop a novel nanostructure-based and label-free detection system to integrate a biomolecule separation media and a detection system on a single chip.

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