

# Three-dimensional bochip microarray using magnetic force interaction and self-asswmbly

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**Abstract:** This paper describes a new constructing method of multifunctional biosensor using many kinds of biomaterials. A metal particle and an array were fabricated by photolithographic. The metal particles were in a multilayer structure (Au, Ti, and Ni). Biomaterials were immobilized on the metal particle. Sidewalls of patterned Ni dots on the array were covered by thick negative photoresist (SU-8), and the array was magnetized. The array and the particles were mixed in a buffer solution, and were arranged by magnetic force interaction and random fluidic self-assembly. Binding direction of the metal particle onto Ni dots was controlled by multilayer structure and direction of magnetization. A quarter of total Ni dots were covered by the particles. The binding direction of the particles was controllable, and condition of particles was almost with Au surface on top. The particles were successfully arranged on the array. The biomaterial activities were detected by chemiluminescence and electrochemical methods.

**Author Keywords:** Biochip; DNA; Hybridization; Hydrophili; Magnetic force; Self-assembly

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