

Control of the Droplet Size Fabricated by Electrohydrodynamic (EHD) Technique for the Construction of DNA Chip

Yong-Hark Jang², Woochang Lee¹, Jeong-Gun Lee³ and Jeong-Woo Choi^{*1,2}

¹Interdisciplinary program of Integrated Biotechnology, Sogang University, Seoul 121-742, Korea

²Department of Chemical & Biomolecular Engineering, Sogang University, Seoul 121-742, Korea

³Samsung Advanced Institute of Technology, Kihung-Eup, Yongin, Gyunggi-Do, Korea

TEL: +82-2-705-8480, FAX: +82-2-3273-0331, E-mail: jwchoi@ccs.sogang.ac.kr

Abstract

Miniaturized microarray with the activity and the stability of biomolecules allows the enhancement of sensitivity, specificity, and reproducibility with respect to target molecules. In this study, an electrohydrodynamic (EHD) deposition technique was applied to the construction of DNA array (Fig.1). In order to control the size of the fabricated DNA spot, effect of the surface characteristics, the physical shape of electrode, and the relative humidity was investigated, respectively. Experimental results showed that the reduction of the fabricated spot was significantly decreased in the syringe-type electrode when the relative humidity was low. When the diameter of the syringe-type electrode was reduced to 210 μm (110 μm of inside diameter), the size of the fabricated DNA spot was measured to be 180 μm .

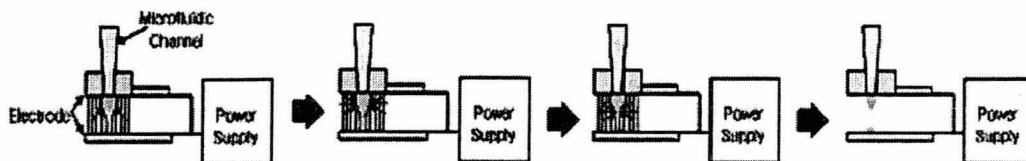


Fig.1 Principle of electrohydrodynamic (EHD) deposition of liquid droplet.

Reference

1. Borra J. P., Ehouam. P, Boulaud. D, " Electrohydrodynamic atomization of water stabilized by glow discharge-operating range and droplet properties", 2004, J. Aerosol Science, 35, 1313-1332.