

## Construction and Characterization of the Biospecific Chip Platform on a Glass using Poly(amidoamine) Dendrimer

Hongsub Kim, Mi-Young Hong, Hak-Sung Kim\*

Department of Biological Sciences, Korea Advanced Institute of Science and Technology 373-1, Kusung-dong, Yusung-ku, Taejon 305-701, Korea  
TEL: +82-42-869-2656, FAX: +82-42-869-2610

### Abstract

We developed a straightforward method to construct a biospecific platform on a glass using poly(amidoamine) (PAMAM) dendrimer (G4) and strong avidin- biotin interaction. This consists of adsorption of a PAMAM dendrimer in a methanolic solution, derivatization with a biotin reagent, and assembly of an oriented neutravidin layer. First, the known phenomenon, adsorption of a PAMAM dendrimer on a glass was verified by measuring densities of surface amines using 4-nitrobenzaldehyde and comparing with the estimate from a closely hexagonal-packed dendrimer monolayer on gold. From reproducibility tests using FITC-labeled avidin and a fluorescence scanner, the dendrimer-adsorbed surface exhibited good stability to various conditions applied in biological studies such as long incubation time, sonication, and chemical treatment with detergent-containing buffers with a low/high pH. Consequently, obtained biospecific platform from a neutravidin-biotin interaction exerted great efficacy in considerably minimizing nonspecific protein adsorption (NSB) rather than not-treated surfaces. Advantages of oriented neutravidin layer and NSB minimization effect was also examined through extension studies employing antibody microarrays and other biochip-related assays.

### References

1. M. Y. Hong, H. C. Yoon, H. S. Kim (2003), Protein-Ligand Interaction at Poly(amidoamine) Dendrimer Monolayers on Gold, *Langmuir*. **19**, 416-421.
2. R. C. van Duijvenbode, G. J. M. Koper, M. R. Bohmer (2000), Adsorption of Poly(propylene imine) Dendrimer on Glass. An Interplay between Surface and Particle Properties, *Langmuir*. **16**, 7713-7719.