

Concentration/Purification Technologies: Multi-Functionalities of Nanostructures in Biosensing Fields

Sang Jun Son¹, Junhong Min^{2*}

¹Department of Chemistry, Gachon University, ²School of Integrative Engineering, Chung-Ang University

Sample concentration and purification processes are essential in the bio-analytical and pharmaceutical fields because most bio samples or media are extremely sophisticated. To concentrate and purify specific substances, passive membrane type filters have been utilized, which is driven by size or charge differences between target and others. The traditional and representative method to identify nucleic acid sequences in the complex biosample is gel electrophoresis, which has been worked by size and net charge of molecules. The adsorption phenomena have been also utilized to concentrate and purify biomolecules. This adsorption of biomolecule can be controlled under specific salts and surfaces as well as surface area. To utilize the differences of physical properties of molecules or bio-targets such as virus, bacteria, and cells, the nanotechnologies can be introduced in target concentration, purification, and isolation processes. In here, I'd like to briefly survey typical examples of nanobiotechnologies which are introduced in sample treatment. Also I specifically demonstrate two different simple techniques to concentrate and detect bacteria from the samples using multifunctional silica nanotube (SNT).

Keywords: Nanostructure, Biosensing, SNT