

Three-Dimensional Self-Assembly of Gold Nanoparticles Using a Virus Scaffold

Aeyeon Kang¹, Young-Mi Lee², Hyo Jin Kang², Sang Jeon Chung², Wan Soo Yun^{1*}

¹Department of Chemistry, Sungkyunkwan University (SKKU), Suwon 440-746, ²Bionanotechnology Research Center, Korea Research Institute of Bioscience and Biotechnology (KRIBB), Daejeon 305-806, Korea

Templated strategy is a very powerful tool for creating multi-dimensional self assembly of nanomaterials. Since viral protein cages have a uniform size with a well-defined structure, they can serve as an excellent template for the formation of a three-dimensional self-assembly of synthetic nanoparticles. In this study, we have examined the feasibility of the 3D self-assembly of gold nanoparticles of various sizes using a brome mosaic virus (BMV) capsid with cysteine groups expressed on its surface as a scaffold for the assembly. It was found that the three-dimensional clusters of gold nanoparticles with a designed structure were attainable by this approach, which was verified by transmission electron microscope (TEM) and dynamic light scattering (DLS) analysis.

Keywords: 3D self-assembly, Templated assembly, Virus scaffold