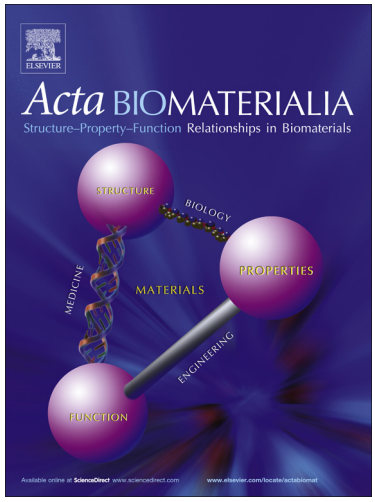

Full length article

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Size-Dependent Neutralizing Activity of Gold Nanoparticle-Based Subunit Vaccine Against Dengue Virus

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Abstract

Dengue results in substantial human morbidity and significant socio-economic impacts, but a specific dengue therapeutic is not available. The currently available dengue vaccine has low efficacy and high rate of adverse effects, necessitating different strategies for the development of a safer and more efficient vaccine against dengue virus. We describe here a hybrid combination of different-sized gold nanoparticles (AuNPs) and domain III of envelope glycoprotein derived from serotype 2 of dengue virus (EDIII) as dengue subunit vaccine. The efficacy of the EDIII-functionalized AuNPs (AuNP-E) to induce neutralizing antibody in BALB/c mice is evaluated. Obtained results show that AuNP-E induced a high level of antibody which mediates serotype-specific neutralization of dengue virus. More importantly, the level of antibody is dependent on both the size of AuNPs and the concentration of AuNP-E, implicating the possibility to modulate it through adjusting these parameters. These results represent an important step towards the development of tetravalent AuNP-based subunit dengue vaccine.