GOLD NANOPARTICLE BASED NSET FOR SELECTIVE SENSING OF HEPATITIS C VIRUS RNA

Dulal Senapati, Jelani Griffin, Anant Kumar Singh, Uma Shanker Rai, and Paresh Chandra Ray

Department of Chemistry, Jackson State University, Jackson, MS, USA

Abstract: The human suffering exacted by the hepatitis C virus is enormous. Hundreds of thousands of people die each year from liver failure and cancer caused by this infection. The hepatitis C virus (HCV) is a single-stranded RNA virus which is responsible for chronic liver diseases, such as cirrhosis, end-stage liver disease, and hepatocellular carcinoma. At present, the most widely used method of diagnosing HCV is the detection of anti-HCV antibodies using a screening Enzyme-Linked Immunosorbent Assay (EIA), based on recombinant proteins from the HCV genome. While it is highly sensitive and specific, this assay has huge limitations. For example, it cannot detect viruses during the early stage of infection, at which time antibodies against HCV antigens are not produced. In addition, patients who are immuno-suppressed following transplantation, or who are immuno-compromised secondary to infection with the human immunodeficiency virus (HIV), may exhibit HCV infection without having any detectable antibodies. There is a need for a direct RNA-based test, which detects the presence of the HCV viral sequence. Driven by the need, here we discuss our recent report on ultra-sensitive gold nanoparticle based surface energy transfer (NSET) probe for screening of the hepatitis C virus (HCV), which has excellent sensitivity and selectivity.

Keywords: Nanotechnology, NSET, hepatitis C virus (HCV) RNA

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