Joong Hyun Kim et al., J Mat. Sci. 2017, 5:6
DOI: 10.4172/2321-6212-C1-009

Target specific detachment of multiple RNA probes from graphene oxide using RNase H for a simple and direct molecular diagnostics

Joong Hyun Kim, Chan Ho Chung and Mina Park
Daegu-Gyeongbuk Medical Innovation Foundation (DGMIF), Republic of Korea

Strong fluorescence quenching and preferential adsorption of ss DNA or RNA on Graphene Oxide (GO) enabled to detect target gene in a simple and direct manner. However, GO interferes with probe binding to the target because of their strong binding affinity to GO resulting in decreased detecting sensitivity. Therefore, we introduce a strategy to detach multiple probes per single target DNA from GO using RNase H, a ribonuclease to act on only RNA paired with DNA. Since DNA becomes free to bind the RNA probe adsorbed on GO after digestion of the paired RNA by RNase H, multiple RNA probes could be detached from GO and are degraded by RNase H. As a result, fluorescence signal could be amplified allowing a sensitivity detection of target DNA. Until now, we could detach and digest maximum 76 RNA probes per single target DNA from GO. In current, we are addressing effect of GO on specificity of probe detachment and adsorption or deactivation of the enzymes as well. In the presentation, we will discuss more details of the results.

Biography

Joong Hyun Kim has completed his PhD in 2006 from University of California Riverside and postdoctoral studies from University of California Santa Barbara. Currently he is a Principal Researcher of Daegu-Gyeongbuk Medical Innovation Foundation (South Korea).

jhkim@dgmif.re.kr

Notes: