Mercury ion detection using SERS based NW sensor and aptamer

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Surface-enhanced Raman scattering (SERS), which can provides single molecule sensitivity, molecular specificity, and facile detection, have rarely been applied to the detection of Hg2+ because of difficulties in quantitative analysis. This study reports novel single-nanowire-on-film (SNOF) SERS sensor for the detection of Hg2+ based on a structure-switching aptamer. The detection limit of SNOF SERS sensor is 100 pM, which is lower than those of fluorescent and color perceptive sensing methods. In addition, the adoption of aptamer, which can specifically bind to Hg2+, allows us to detect Hg2+ selectively. Since the single nanowire (NW) can be a molecular sensor, the small chip carrying individually modified multiple NWs could be fabricated. This chip may detect various analytes in one assay through the specific recognitions of numerical aptamers. [This research was supported by WCU program through the Korea Science and Engineering Foundation funded by the Ministry of Education, Science and Technology (R32-2008-000-10142-0)]