Functionalized three-dimensional carbon microarrays for cancer biomarker detection

Abstract

A label-free detection strategy for the detection of platelet-derived growth factor (PDGF-BB) oncoproteindetection using signaling aptamer/protein binding complex is reported. The 3D carbon microarraysdetection platform was fabricated by pyrolyzing patterned photoresist and surface functionalized using directamination technique. The detection strategy is based on the release of TOTO intercalating dye from the target binding aptamer's stem structure when it captures PDGF. The sensor showed near linear relationship between the relative fluorescence difference and protein concentration with a very gooddetection limit of 5 pmol. This detection strategy is promising for the potential detection of differentcancer biomarkers and proteins.

Keywords

Cancer biomarker detections; Carbon; Diseases