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Electrochemical nanobiosensor on Si3N4 nanowell array electrode

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In order for an electrochemical sensor to be adopted in a wide range of applications such as diagnosis in traditional medical, pharmaceutical, and healthcare settings, medical diagnosis in non-hospital setting (e.g., self-administered consumer diagnostics as pregnancy test or blood glucose monitoring), non-medical detection of biological and small molecule detection, companion diagnostics for pharmaceutical therapeutics; research applications where detection of small molecules are required, and other settings or circumstances where detection of biological molecules is needed, the electrochemical sensor must be sensitive, selective, easy to use, and readily available to users (i.e., able to manufacture scalably, in large quantities, and at a low cost). We have reported that Si3N4 nanowell array (NWA) can enhance electrochemical detection of molecular binding events by controlling the binding sites of the captured molecules. Here we'll report an immunosensor based on wafer-scale NWA for electrochemical detection of TNF-α. In order to develop NWA sensor through the cost-effective combination of high-throughput nanopattern, the NWA electrode was fabricated on glass wafer by krypton-fluoride (KrF) stepper semiconductor process. Finally, 12,500,000 ea nanowell with a 230 nm diameter having a pitch ratio (ratio between the diameter of the nanowell openings and the shortest distance between neighboring nanowells) of approximately 1:1 was fabricated on 4 x 2 mm2 substrate

Biography

YoungTae Seo is currently graduate student at Queens College of the City University of New York, USA.

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