

(The Relationship Between Electronic Nano Memory and Nano Structures) Testing The Effect of Quantum Confinement (Quantum Confinement)

Dr.Afshin Rashid , Assistant Professor

Faculty member Islamic Azad University of Science and Research Branch, Tehran

- **Abstract:**

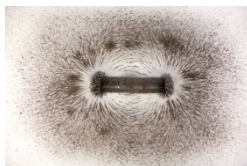
- In the dynamic process of sorting and precise positioning of nanoparticle biomasses into predefined microstructures is crucial, however, it is a major obstacle to the realization of surface-sensitive nanobiosensors and practical nanobiochips.

- **Keywords:** nanoparticle , Nanoelectronic , practical nanobiochips , Nano biomasses

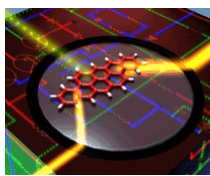
Introduction •

A scalable, widespread, and non-destructive trapping method based on dielectric forces is highly needed for the capture of nanoparticles and nanobiosensing devices. Here, we present a vertical nanogap architecture with an electrode-insulator-electrode stack structure. It facilitates the generation of strong dielectric forces at low voltages, for the precise capture and manipulation of nanoparticles and molecular assemblies, including lipid vesicles and amyloid beta fibril proteins/oligomers. Our vertical nanogap platform, allowing low-voltage capture of nanoparticles and capture in optically dimensioned designs, provides new opportunities for the fabrication of advanced surface-based surface-sensitive sensors. Nanobiosensors appear as a powerful alternative to conventional analytical techniques, as nanosensors enable highly sensitive, real-time, and high-frequency monitoring of pollutants without extensive sample

preparation. Nanobiosensors can be integrated into small devices for rapid screening and monitoring of a wide range of pollutants. Since a nanobiosensor is an analytical device, used to detect a chemical substance, which combines a biological component with a physicochemical detector. The sensitive biological element, e.g. tissue, microorganisms, etc., is the material component or biomimetic that interacts with the nanoparticles.



A biosensor typically consists of a bioreceptor (enzyme/antibody/cell/nucleic acid/aptamer), a transducer component (semiconductor/nanomaterial), and an electronic system that includes a signal amplifier, processor, and display. The transducers and electronics can be combined, for example, in CMOS-based microsensor systems. The detection component, often referred to as a bioreceptor, uses biomolecules from living organisms or organisms modeled after biological systems to interact with the analyte of interest. This interaction is measured by a transmembrane transducer that produces a measurable signal proportional to the presence of the target analyte in the sample.



In, the dynamic process of sorting and precise positioning of nanoparticle biomasses into predefined microstructures is crucial, however, it is a major obstacle to the realization of surface-sensitive nanobiosensors and practical nanobiochips.

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