Qeios

Peer Review

Review of: "Dedicated functionality in nanobiosensors"

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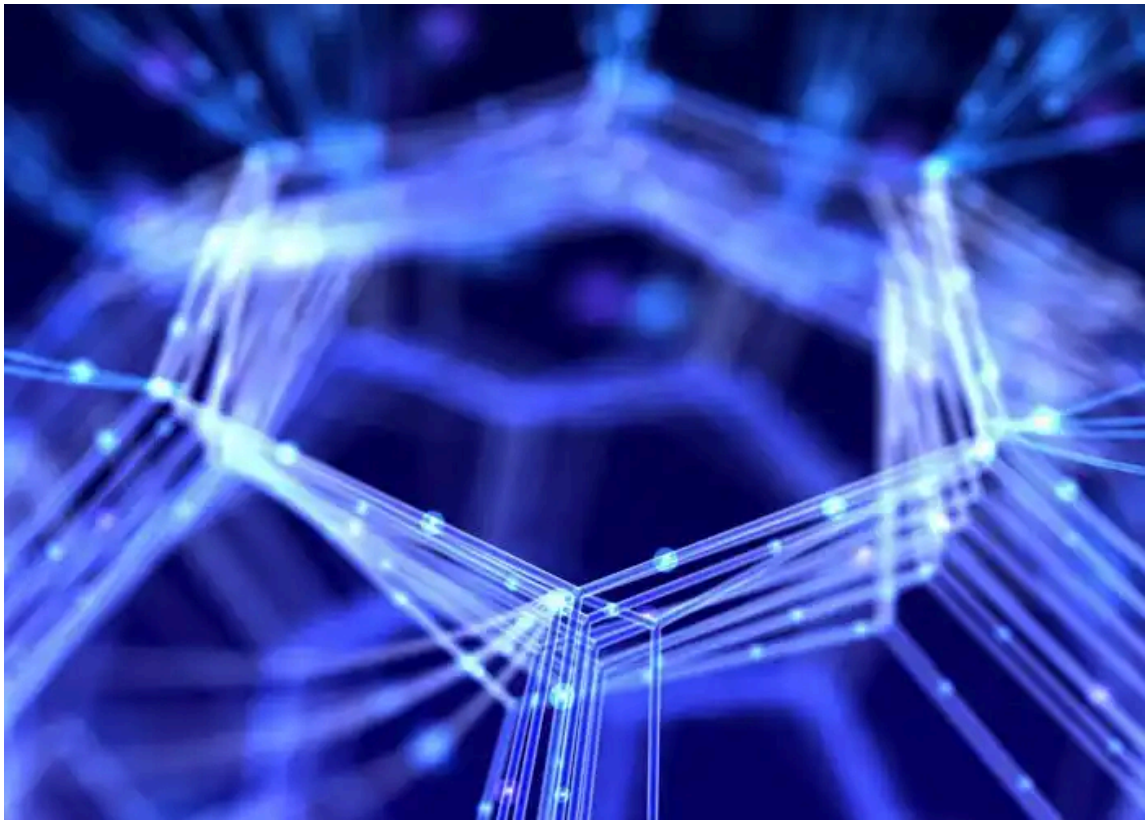
Dynamic range in nanobiosensors

Another parameter that is rarely discussed in the context of nanobiosensors is the dynamic range of the sensor. This is the range in which the sensor is able to produce an output signal that is representative of the amount of analyte. The sensor response curve is linear and describes a wide range of analyte amounts and the corresponding sensor output .



Dedicated functionality in nanobiosensors

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In addition to being able to produce an output signal indicating the presence of an analyte, a sensor must be able to identify a specific analyte. This ability is called specificity and is the factor by which the sensor can be effective in an unobserved environment containing large amounts of unknown substances. Unlike sensitivity, measuring the performance of a specific nanobiosensor is difficult because the number of substances that should not produce an output signal is very large. Specificity is most useful when a sensor must detect a small concentration of a specific analyte in an environment containing large amounts of non-target substances, many of which may bind non-specifically to the sensor and thus produce an unusual signal. Gold nanoparticles have the ability to rapidly and directly transfer electrons between a wide range of electroactive materials . They also have light scattering properties and the ability to enhance a local magnetic field. Gold nanobiosensors can be classified into three categories: optical nanobiosensors, electrochemical nanobiosensors, and piezoelectric nanobiosensors . Metal nanoparticles such as platinum and silver are also of great interest due to their unique size and optoelectronic properties . Their size is related to optical, magnetic, chemical, and electrical properties.

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Declarations

Potential competing interests: No potential competing interests to declare.