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Tunable, Spatially Controlled Functionalization Strategy for Multianalyte Sensing

A new method for layer-by-layer assembly of enzyme-based biosensors enables smaller, high-resolution, multi-substance monitoring devices for medical and research applications.

The role of biological sensors is invaluable to the study of life sciences; sensors with higher accuracy, smaller size, or increased functionality enable deeper insights and improved tools for research or medical applications. A major goal of this type of research is a miniature sensor that is capable of sensing multiple substances. These sensors could be implanted in the body for in vivo monitoring of glucose, metabolism, or other biological conditions.

Researchers at Purdue University have developed a new method for layer-by-layer assembly of enzyme-based amperometric biosensors. The design uses electroactive polymer based nanomaterials to allow for fine control of localization and doping, enabling high spatial and temporal resolution multianalyte sensing. Unlike current functionalization strategies, this one has the electrode actively produce its own entrapment matrix, which makes this method more easily amendable to further miniaturization and multiplexing.

Advantages:

-Scalability

-High spatial and temporal resolution

-Adaptable with enzymatic transducers and macro/nanoscale sensing paradigms

Potential Applications:

-Glucose sensing chips for blood glucose monitoring

-On-chip sensors for metabolites

-Implantable electrodes for in vivo monitoring of multiple analytes

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Category

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