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Meet the Inventors

[Garcia, Michael](#)
[Brown, April](#)
[Lampert, William](#)
[Wolter, Scott](#)

Contact For More Info

Koi, Bethany
919-681-7552
bethany.koi@duke.edu

Department

Electrical & Computer Engineering (ECE)

InAs-based nitric oxide species gas sensor

Background

Biological and chemical sensor systems are of great importance for monitoring medical and environmental conditions and for warfare threats. While great strides have been made in sensor technology over recent years, sensors are still too large, unreliable and expensive for widespread and easy use.

In comparison to other more common semiconductor systems, such as Si and GaAs, InAs is unique in that the material possesses a high conductivity electronic surface charge and this concentration is highly sensitive to modifications of the surface electronic properties. It has been suggested that properly functionalized surfaces of InAs-based sensors can be engineered to target almost any specific analyte for chemical or biological application.

Technology

A biosensor device, InAs based solid state sensors with engineered, functional surfaces that act as pseudo-gates, modifying the material conductivity upon analyte capture. The transduction platform is an active device that may be tuned for responsivity and sensitivity. Nitric oxide species was used for the analyte, as it plays an important role in many biological processes including their relevance to immune, antimicrobial, smooth tissue relaxant, and neuronal bioactivities. This device can be used in many research and application domains from the study of chemical reactions in the biological realm to monitoring the levels of analytes in aqueous habitat environments.

