

Nanosensor For Detecting Trace Pesticides In Water

Pie Pichetsurnthorn

Bioengineering

Abstract: Atrazine is a pesticide commonly used in agricultural crops. Its runoff into local water systems and later into larger water systems raises environmental and health concerns. Some studies show Atrazine may cause impaired fertility, delayed onset of puberty, liver degeneration, etc. Atrazine contamination in water streams are in the low nanogram/ml range. The objective of this project is the design and testing of a nanosensor for trace detection of Atrazine and to increase sensing sensitivity by lowering the detection limit. The biosensor uses nanoporous membranes to achieve ultra-low detection of Atrazine. The detection assay uses antibody–antigen binding chemistry to achieve detection. Binding is detected through impedance spectroscopy as a cascading charge transfer results from specific binding between the antibody and Atrazine. The change in impedance before and after binding is recorded from the biosensor. The change correlates to the Atrazine concentration within the sample. By increasing sensing sensitivity to detect lower concentrations of Atrazine in water systems, environmental and health concerns from Atrazine exposure can be addressed in quicker and more efficient manner.

Faculty Sponsor: Shalini Prasad

- *URCAF 2011 first place winner of poster presentations in the Natural Science section.*