

## Graphene-Aptamer Chemical Sensors to Detect Toxins in Water

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### Abstract

Graphene-enabled nanobiosensors are emerging as a scalable, cost-effective nanotechnology that could be used for ubiquitous monitoring of hazardous chemicals in the environment. We propose a new paradigm of a nano-enabled water testing system **to quantify the concentration of bisphenol A (BPA) and other toxic contaminants in water samples**. We will develop and calibrate a graphene-aptamer system capable of measuring BPA in the concentration range 1 – 1,000 nM within several minutes. Device design will be based on scalable processing, and the control electronics will be compatible with miniaturization based on commercially available integrated circuits. The approach is compatible with fabrication of large sensor arrays (hundreds or even thousands of sensors) that could be used to quantify the concentration of many different molecular targets in the same water sample.