

ENVIRONMENT SECTOR

Biotechnology Research Institute

INFORMATION

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"Our team has developed emerging silicon based surface plasmon resonance and reagentless electrochemical sensing with high sensitivity and rapid response for the detection of pathogens, heavy metals, and important molecules in biological samples, water, soil, and food. We also develop cell-based assays with high throughput based on impedance spectroscopy as a screening tool in environmental monitoring and drug discovery."

Biosensors and Nanobiotechnology

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BIOSENSORS AND NANOBIO TECHNOLOGY

BRI's Biosensors and Nanobiotechnology Group conducts research into nanostructure-based biosensors and fosters the use of nanoparticles to improve the performance of several key biosensing platforms. We are engaged in the development of nanosized biosensors using carbon nanotubes and nanoparticles to fabricate reagentless biosensors with enhanced sensitivity for various important applications.

Our Research Activities

- ▶ Development and characterization of nanosized electrodes with remarkable response time, sensitivity and reproducibility.
- ▶ Preparation of single wall carbon nanotubes and new sensing materials for the development of reagentless biosensors.
- ▶ Functionalization of nanostructures with biomolecules such as phages, receptors, DNA, and antibodies.
- ▶ Development of surface plasmon resonance sensing based on silicon and infrared light.
- ▶ Development of AFM technologies for nanoparticle imaging.
- ▶ Sensitive impedance sensing using DNA and nanoparticle modified electrodes for drug, organic pollutants, and heavy metals.

Our Services

- ▶ Study of cell behavior, mainly adhesion, spreading and mortality for applications related to drug screening and toxicological effects of toxic materials.
- ▶ Detection of viruses, microorganisms and their components in water, air, soil or food, ensuring environmental monitoring and protection of the public food supply.

- ▶ Diagnostic tools for diabetic management, food quality monitoring, and cancer markers.
- ▶ Speedy detection of biological warfare agents, mainly viruses and bacteria and protection against them.

Research Examples

In collaboration with several academic and industrial partners, in particular with École Polytechnique de Montréal and Biophage, we have focused our effort on some strategic areas:

- ▶ Femtosecond laser ablation procedure for fabrication of metallic nanoparticles with well-controlled particle size and monodispersion for applications in immunoassays and other sensing platforms.
- ▶ Fast, reliable and highly reproducible procedure for imaging nanoparticles using atomic force microscopy.
- ▶ Biosensors for glucose and biogenic amines with a response time of only 2 seconds and a detection limit well below 2 μ M.
- ▶ Impedance sensing using phages and nanoparticles for detection of pathogens with improved sensitivity and reliability.

Our Business Approach

Our team is flexible and tailors its collaborations to meet the need of our partners. We engage in service contracts and license out our technologies. With BRI, you have access to advanced technologies and a broad diversity of experts who publish regularly in leading scientific journals.

Contact us for more details.



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