

## Environmental Immunosensor

### Business Opportunity

The on-site monitoring of water sources, particularly in remote locations, involves the detection of trace concentrations (often at parts per billion level) of small antigenic compounds such as pesticides, herbicides, antibiotics, etc. The demand for such environmental monitoring is increasing due to a range of issues such as the impact of agriculture on drinking water supplies and the threat from global terrorism. Existing analytical methods involve either returning a sample to the laboratory or the use of test kits, involving a number of different technologies, to identify the presence of contaminants. The latter involve user intervention, eg the addition of labelled antibodies, and/or subjective assessment of a colorimetric reading. The UNSW invention provides a single robust sensor that provides a rapid, electrochemical signal to identify the presence and concentration of contaminants.

Although this is a crowded market with a range of devices being offered, few, if any, have been widely adopted. UNSW believes that its technology, will meet the demands for an accurate portable water testing device for environmental monitoring. The patented technology also has applications for antibody detection as a medical diagnostic device. The preferred commercialisation strategy for this technology will involve production engineering the device with a licensee already involved in the biosensor device market.

### The Market

The global biosensor market is currently worth US\$2.3 billion and is set to double in value to US\$4.6 billion over the next 5 years with an annual growth rate in excess of 10%. Of this, less than 10% is accounted for by environmental monitoring applications. The opportunity for a robust, reliable and easy to use sensor is significant with customers in the defence, environmental protection and consumer sectors. There are currently, many SME's engaged in the manufacture and distribution of biosensors for medical diagnostics (eg glucose sensors) and that are seeking to diversify their portfolio and we will be targeting these as potential commercialisation partners.

### The Technology

This invention employs an electrode interface modified with an analogue of an antigen attached to the end of an electrochemically active molecular wire. The biosensor can operate in two modes as illustrated in Figure 1. In Mode 1, the immunosensor can be used to monitor the presence of antibodies to the antigen via the attenuation of the electrochemical signal upon binding of the antibody to the antigen.

In Mode 2, the interface is prepared with the antibody bound to the antigen analogue on the electrode surface.

Exposure to a sample which contains the antigen results in a competition for the surface bound antibody. Displacement of the antibody from the interface due to the presence of the antigen results in an increase in electrochemical signal.

The use of a single dip sensor and electrochemical signal is in contrast to other immunosensors such as ELISA which require washing steps and/or the addition of labelled antibodies/antigens to detect the binding event.

The technology appears best suited to small antigens such as small antigens and some toxins but could be extended to larger analytes if an analogue of the antibody epitope can be synthesized.

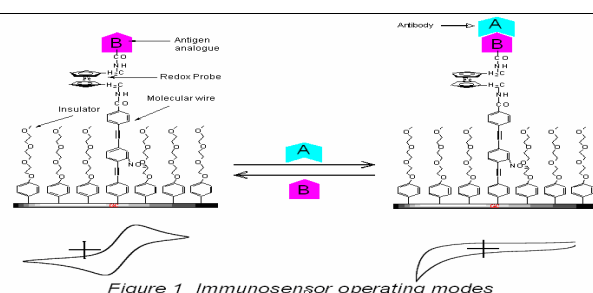


Figure 1 Immunosensor operating modes

### The Management/Scientific Team

The immunosensor device has been developed by Professor Justin Gooding and his colleagues from the School of Chemistry at UNSW. Professor Gooding has an international reputation in the study of biological recognition molecules. Future commercialisation will be managed by Dr Robin Stanley (NSi) who has over 20 years experience with the commercialisation of device innovations.

### Investment Opportunity

NSi is seeking interest from funding partners interested in supporting further development of a range of immunosensors for detecting different toxins with a view to subsequent licensing of manufacturing and distribution rights.

#### Further Information:

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