

## Next Generation BioDetection Today

*BioXene™ is a Hawaii-based biotechnology company. Formed in 2004, BioXene is focused on developing state of the art biosensing technology for rapid and sensitive detection of a wide variety of targets. Utilizing a proprietary patented platform technology developed at the University of Hawaii, BioXene's unique sensor-protein technology offers several key distinctive competitive advantages over existing molecular detection methods such as ELISA and Western blot.*

### Key Features of BioXene's Sensor-protein Technology

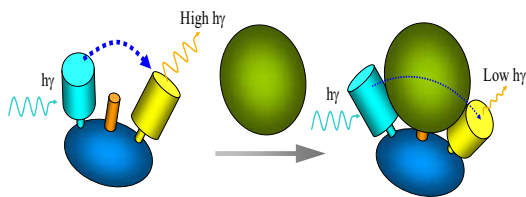
- Self-reporting – an easily detectable signal is directly generated upon binding of analyte to the sensor.
- Simplicity - one step “mix and read” assay without multiple washing steps. Does not require highly-trained technician. Simple assay process reduces errors caused by technician mishandling.
- In-solution detection – suited for homogeneous noncompetitive assays and high-throughput applications.
- Adaptability -- modular nature of the sensor protein design provides a molecular platform for creating sensor agents to detect proteins, antibodies, nucleic acids, spores, viruses, cells, and metal ions.
- Low overhead costs – detection using simple fluorometer.
- Portable - onsite detection.
- Rapid – quick reaction time provides results in under an hour (no complex sample preparation required).
- Targeted detection – specificity on par with ELISA tests.
- Affordable – sensors will be cost competitive with existing ELISA tests.
- Multiplexing possible – sensors adaptable to detect more than one target analyte.
- Quantifiable results – readout provides an accurate count of the target analytes in sample tested

### Simplified Detection Process

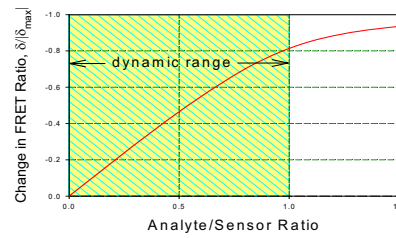
- BioXene sensor proteins are mixed directly with the target sample in solution and read by a fluorometer (no laborious sample preparation, labeling or washing is required).
- Measurements allow rapid quantification of target analyte concentration in solution.
- Results are provided in under an hour, saving significant time and money.

### How it Works

The working principle of BioXene's novel self-reporting sensor platform is based on modulating the Förster resonance energy transfer (FRET) property of uniquely-designed sensor proteins upon binding to their targets. The sensor protein comprises a molecular (protein) scaffold, a pair of labels which interact *via* FRET, and one or more ligand/molecular recognition domain (MRD) grafted onto the protein scaffold or the FRET label by chemical conjugation or genetic fusion. These sensor proteins serve as efficient self-reporting optical transducers. When placed in contact with a target analyte, the sensor protein displays a change in its FRET property that can be conveniently detected using standard fluorometry. These sensor molecules are considered self-reporting since no additional reagent/label for signal generation is required. The modular nature of the sensor protein design provides a molecular platform that can be conveniently modified, by changing the MRD, for detecting different biomolecular binding events both *in vitro* and *in vivo*. The working principle and typical response of the sensor are depicted in Figs. 1 & 2, respectively.



**Figure 1.**



**Figure 2.**

Having the ability to rapidly and accurately detect specific biomolecular binding events in homogeneous assays, while requiring only a simple procedure and instrument, is of great value. In addition to its direct applications in healthcare and biotechnology, BioXene sensor technology also provides a powerful tool for basic scientific discovery that could lead to development of many new and useful practical applications.

**Initial Products** – A sensor agent for detecting His-tagged recombinant proteins in solution has been chosen as the first of many products using our unique proprietary platform. BioXene is also developing a repertoire of sensor proteins that incorporate different unique peptide and nucleic acid-based molecular recognition domains for various applications.

- **In-solution His-tag Sensor.** His-tag is widely used in research labs as well as large-scale protein production facilities to aid recombinant protein purification. Currently, identification and monitoring of recombinant proteins involve laborious procedures such as gel electrophoresis. BioXene's His-tag detection sensor is superior to existing products, allowing researchers and practitioners a much quicker, simpler method of measuring/monitoring His-tag recombinant proteins directly in-solution, without running gel electrophoresis. Current methods typically take several hours and require multiple procedures by skilled technicians; BioXene's sensor technology will reduce the entire process to under an hour in a simple mix and measure procedure. In addition, the ability of using BioXene's sensor proteins in homogeneous assays allows researchers to continually track and monitor the presence of the His-tag proteins in-solution throughout the entire protein purification process.
- **Peptide/Nucleic acid-conjugated Sensors.** A variety of peptide substrates, epitopes, binders, and peptide/DNA/RNA aptamers can be incorporated into the BioXene sensor protein scaffolds to create a wide range of nanobiosensors for rapid in-solution assays. BioXene is currently seeking strategic collaboration to further develop these novel sensing agents.

**United States Patent** - Issued July 24, 2007. Number 7,247,443. "Sensor constructs and detection methods."

Wei Wen Su

BioXene welcomes strategic collaboration and distribution partnerships as well as sponsors and investors who are interested in investing in BioXene.

**Contact Information:**

Victor Wong  
 BioXene  
 4224 Waiialae Avenue #276  
 Honolulu, HI 96816 USA

Tel: (808) 781-9537  
 Email: [victor@bioxene.com](mailto:victor@bioxene.com)  
 Website: <http://www.bioxene.com>