Other Projects

(A) High-Efficiency Adsorbent Sampling System Based on Mesoporous Oxide

Presently **Bioenno Lifesciences** is developing a *High-efficiency adsorbent sampling system based on mesoporous oxide*. We are developing a high surface-area, mesoporous oxide adsorbent sampling system that consists of an infrared transparent microfluidic column for rapid detection of chemical contaminants in water. The primary purpose of this micro-fluidic approach is to mimic the behavior of solid phase extraction or chromatographic columns in terms of separation and concentration capabilities while providing a platform that is suitable for easy integration with an infrared-based detection system. Presently there are numerous environmental applications for a robust, standoff chemical and biological sensor. A standoff sensor that can be used for detecting both chemical vapors and biological aerosols will significantly reduce the logistics burden by reducing the number of sensors in the field. A rugged, inexpensive chemical sensor will also benefit the manufacturing community by providing inexpensive monitoring of chemical and biological processes.

(B) Nanomaterials-based biosensor

Our company is developing a broad-based biosensor with an "off" to "on" functionality to allow for sensing of potential hazards and can be used for the detection of toxic chemical and biological agents. Such a sensor can be deployed in biological environments for real-time detection of agents of interest and for defense of potential hazards. Successful commercial development of such a nanotechnology-based biosensor would result in broad commercial applications such as the detection of agents of interest or potential hazards in the environmental, biomedical, pharmaceutical industries.
Currently there is a pressing need to develop a new class of biosensors that is capable of monitoring exposure to biological or chemical warfare agents for either acute or chronic conditions in living systems. The nanosensor can be deployed in biological environments for the real-time detection of agents of interest. Accordingly we are developing propose to develop a nanotechnoloy-based biosensor, with "off" to "on" functionality that will allow for sensing of potential hazards, and with quantitative capability and broad applicability for detecting changes caused by known and unknown threats. The resultant nanosensor should be able to enter living cells and complex environments and remain in an "off" state until exposure to a target occurs, which leads to a direct or indirect signal transduction event. The nanosensor would be easy to implant, be non-toxic in order to be administered even under appropriate suspicion, and function well in both acute and chronic settings.

(C) Tailored Spot Heating and Fluid Transportation

We are also developing a novel class of Tailored Spot Heating and Controllable Fluid Transportation Technology for a number of potential applications in biomedical devices and systems.