Method and Apparatus for Measuring the Environment within a Microfluidic Device

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a simple and inexpensive apparatus for monitoring the environment within a microfluidic device.

OVERVIEW

Microfluidic systems are used for an increasing number of applications, including the evaluation of water purity and determination of the pH range of fluid samples. Several methods have been developed to detect and monitor the environment inside these micron-sized devices; however, they generally require complex instrumentation, are difficult to fabricate, need large power sources and are not portable.

THE INVENTION

UW-Madison researchers have developed a simple and inexpensive apparatus for monitoring the environment within a microfluidic device. The apparatus displays a positive/negative type of readout and is directly fabricated within the microchannel. The readout structure, which consists of dyes imbedded within a hydrogel matrix, functions as both a sensor and a display unit. When specific agents are present, the hydrogel structure swells and releases the dye molecules. Both the size and color of the readout structure change in response to the presence of a predetermined amount of a specific chemical or agent.

APPLICATIONS

• Rapid screening of large numbers of compounds

KEY BENEFITS

• Rapid – much faster than current methods
• Inexpensive – no need for expensive equipment, such as a spectrometer, for detection
• Easily fabricated
• Portable – no batteries or other power sources required
• Simple – no need for complex instrumentation
• Color change can be seen by the unaided human eye.
• A combinatorial readout sensitive to more than one agent can be fabricated.

ADDITIONAL INFORMATION

Tech Fields
Micro & Nanotech - Microfluidics
Analytical Instrumentation - Microfluidics

CONTACT INFORMATION

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