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User-Defined Patterning by a Humidity-Sensitive Hydrogel-Spore Composite

A novel micro-scale dispensing system enables controlled, on-demand creation of efficient and customized functionalized surfaces for micro/nano sensors.

Many micro and nano sensors used in biochemical and medical applications are functionalized by depositing a thin layer of material on the sensor's surface. These "functional" chemicals must be inefficiently pipetted on a larger than necessary area to ensure an even distribution. Currently there are not any simple methods to functionalize a surface in a user-defined, "on-demand" pattern. If the surface needs to be functionalized by a more complicated pattern, techniques such as micro-contact printing must be employed. However, these techniques require that a preset mold be created that cannot be altered on demand.

Researchers at Purdue University have created a unique method to create custom, functionalized surfaces for use in micro/nano sensors. The invention combines water absorbing spores and chemical retaining hydrogel to create a micro-scale "paint brush" that can be grasped and moved by a micromanipulator. Advantages of this system allow the user to control the amount of chemical released, and functionalize multiple areas in close proximity using completely different patterns and chemical concentrations.

Advantages:

-"On-demand" functionalized surface creation

-Efficient, defined, and controlled surface patterns

Potential Applications:

-User-friendly functionalized micro/nano surfaces

TRL: 2

Intellectual Property:

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Category
Robotics & Automation/Automation & Control
Materials Science & Nanotechnology/Advanced Functional Materials
Biotechnology & Life Sciences/Analytical & Diagnostic Instrumentation

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