Molded Microfluidic Fluid Cell for Atomic Force Microscopy (#4847)

Method to integrate an atomic force microscope cantilever into a microfluidic environment

Dr. Todd Sulchek and Dr. Siping Roger Qiu have developed a method to integrate an atomic force microscope cantilever into a microfluidic environment. The apparatus can deliver subnanoliter quantities of solution directly to the sample environment. The design succinctly combines batch-fabricated microcantilevers with batch-fabricated microfluidic channels for use in commercial atomic force microscopes (AFMs). The design provides the first method to allow AFM imaging and force spectroscopy in a microfluidic environment.

Benefits/Advantages

- **More precise** — Three orders of magnitude decrease in volume of fluid containment when working with the microscope
- **Cost-saving** — Allows for the use of less analyte (important for drug companies)

Potential Commercial Applications

- Atomic force microscopy within very small liquid environments
- Pharmaceutical interactions with targets, crystal growth studies, other basic science studies
- Sensor studies

Background/Context for This Invention

Researchers value the atomic force microscope because it allows nanometer scale imaging resolution in physiological environments. However, the current state of the art fluid cells do not allow a correspondingly precise control of the fluid environment. Commercially available fluid cells have sample volumes of a hundred microliters. For many applications, this large volume in relation to the size of the cantilever is a major drawback.

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Patent/IP Information

U.S. Patent Issued

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Publications

For more information about this technology, please visit:
https://licensing.research.gatech.edu/technology/molded-microfluidic-fluid-cell-atomic-force-microscopy