Particle Positioning Device With Periodic Dielectric Structure

This technology offers a particle positioning device to trap and fix cell positions on MEMS resonators. The device uses a photonic crystal optical tweezers, MEMS, and microfluidic channels that decrease variable measurements.

What is the Problem?

Various devices have been developed to study the characteristics of small (e.g., micro- and nano-sized) particles, including living cells. Physical properties of cells, such as cell mass, may be used to study cell growth rate and cell cycle progression which, in turn, may be used to evaluate therapeutics, disease progression, etc. Additionally, devices have been developed to study the properties of small non-cellular particles. Due to the small size of such particles, it may be difficult to isolate the particles in order to subject the particles to various analysis techniques. Additionally, living cells may be suspended in fluidic channels, which introduce variability into analysis techniques due to motion of the particles within the fluidic channel.

What is the Solution?

The solution is a novel particle positioning device. The device is a photonic crystal optical tweezers platform with an array of MEMS resonators and microfluidic channels. The photonic crystal optical tweezers can trap and fix the positions of the cells on the MEMS resonators, which is essential for achieving high accuracy and repeatability.

What is the Competitive Advantage?

Compared to conventional optical tweezers, the photonic crystal optical tweezers require substantially lower optical intensity and can be compatible with individual live cells. Existing techniques for cell work involve suspending living cells in fluidic channels, which introduce variability into analysis techniques. This technique allows for decreased variability in measurements by enabling particle isolation and analysis.

Patent Information:

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References

Technology ID

BDP 8688

Category

Research Tools
Selection of Available Technologies

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Learn more

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