

Abstract Submitted
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Intracavity Microfluidic Laser Device for Single Cell Analysis

PAUL GOURLEY, HighLight Research Lab — An intracavity microfluidic laser device has been developed to study bioparticles ranging in size from 50 nm to 20 μm (virions to organelles to whole cells). The versatile device can be operated used in several modes including static or flowing fluids, with or without molecular labels, and microscopic imaging and/or spectroscopy. It enables advantageous new ways to perform analyses of bioparticles for applications including cell biology, detection of disease and pathogens, environmental monitoring, pharmaceuticals, agriculture, and food processing. This talk will briefly summarize the physics of the device including its laser optics, fluid dynamics, and intracavity light interaction with cells. The talk will then focus on results of a study of mitochondria in normal and cancer liver cells. The study examines the transformation of intracellular and isolated mitochondria from the normal to disease state. The results highlight the unique utility of the device to rapidly assess biophysical changes arising from altered biomolecular states of cells and organelles.

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