Rapid, Portable And Cost-Effective Yeast Cell Viability And Concentration Analysis Using Lensfree On-Chip Microscopy And Machine Learning

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SUMMARY
UCLA researchers in the Department of Electrical Engineering have developed a new portable device to rapidly measure yeast cell viability and concentration using a lab-on-chip design.

BACKGROUND
Yeast cells are frequently used in the alcoholic beverage and baking industry to make beer, wine, and bread. Recently, biofuel production using yeast has emerged to replace fossil fuels. Monitoring the concentration and viability of yeast cells allows for fine-tuning of fermentation parameters, which is crucial for both research laboratories and the industry. Therefore, biofuel, alcoholic beverage and baking industries can benefit from a rapid and cost-effective yeast viability and concentration analysis method. Current methods to test yeast viability are time-consuming, large form factor, and require expensive equipment.

INNOVATION
UCLA researchers led by Prof. Aydogan Ozcan have developed a novel portable lab-on-chip lens free microscope system to monitor yeast cell viability and concentration. Furthermore, the device utilizes machine learning algorithms to process images, eliminating user subjectivity, and reducing acquisition and analysis time. These dual developments have allowed for the development of the Automated Yeast Analysis Platform technology, which yields data that agrees well with current gold-standard technologies.

ADVANTAGES
▶ Small form factor/portable design
▶ Rapid testing if yeast cell viability and concentration
▶ Low-cost instrument compared to gold standard technologies (i.e. hemocytometer or flow cytometry)

RELATED MATERIALS
▶ Rapid, portable and cost-effective yeast cell viability and concentration analysis using lensfree on-chip microscopy and machine learning. Alborz Feizi, Alon Greenbaum, and Aydogan Ozcan. Lab on a Chip. Sept. 2016

PATENT STATUS
Patent Pending

INVENTORS
▶ Ozcan, Aydogan

OTHER INFORMATION
KEYWORDS
Yeast cell viability, yeast cell concentration, haemocytometer, fermentation, yeast, brewers’ yeast, lab-on-chip, microfluidics, machine learning, imaging, cell imaging, cell quantification, dead or alive assay, cell concentration

CATEGORIZED AS
▶ Biotechnology
▶ Food
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▶ Other
▶ Energy
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