



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

Tech ID: 27515 / UC Case 2017-093-0

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

| Country | Type | Number | Dated | Case |
|--------------------------|---------------|------------|------------|----------|
| United States Of America | Issued Patent | 11,320,362 | 05/03/2022 | 2017-093 |

CONTACT

UCLA Technology Development Group
ncd@tdg.ucla.edu
tel: 310.794.0558.



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
 - ▶ Industrial/ Energy
 - ▶ Other
- ▶ **Energy**
 - ▶ Bioenergy
- ▶ **Nanotechnology**
 - ▶ NanoBio
 - ▶ Other
 - ▶ Tools and Devices
- ▶ **Sensors & Instrumentation**
 - ▶ Analytical
 - ▶ Biosensors
 - ▶ Other
 - ▶ Process Control

RELATED CASES

2017-093-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

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UCLA Technology Development Group

10889 Wilshire Blvd., Suite 920, Los Angeles, CA 90095

<https://tdg.ucla.edu>

Tel: 310.794.0558 | Fax: 310.794.0638 | ncd@tdg.ucla.edu

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