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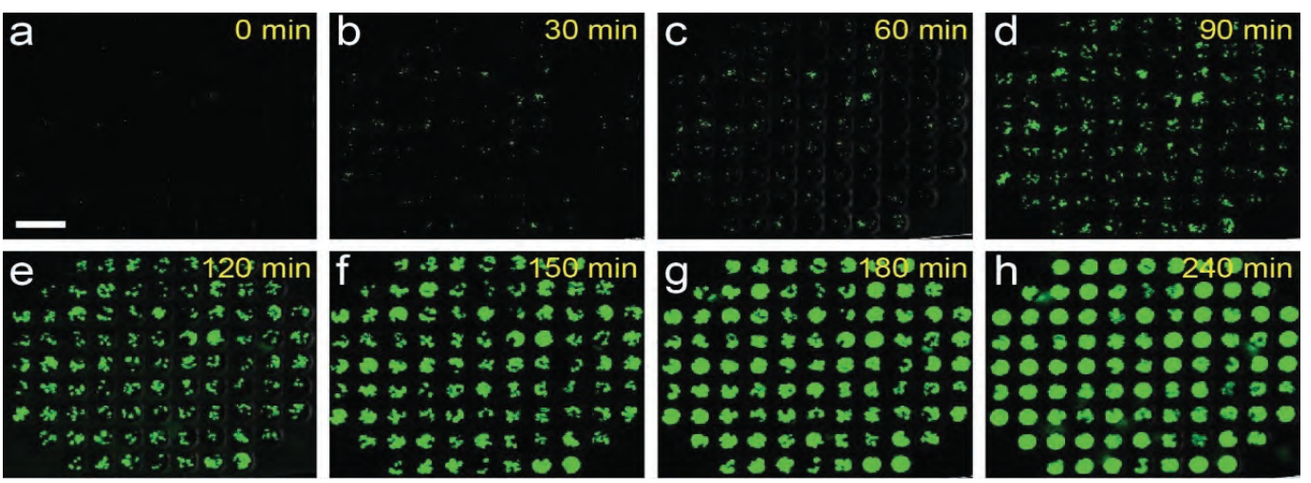
PRESS RELEASE

Rapid antibiotic sensitivity test using microfabricated microwell arrays

Novel tool to assess antibiotic sensitivity in less than 3 hours.



Time-lapse imaging of bacterial growth in microwell arrays, in the presence of Tetracycline [1 ng/mL]. The microwells are loaded initially with a dilute suspension of green fluorescent S. aureus. At 180 minutes, most microwells are filled with S. aureus, indicating sustained growth. Scale bar: 100 μm.

Researchers from the Massachusetts General Hospital (MGH) in Boston have designed an assay that measures bacterial growth with higher resolution than standard techniques. This assay enables faster testing of the effect of different antibiotics on bacteria growth. It relies on an array of microwells that confine a small number of bacteria in small spaces, where their growth can be monitored with high precision. Using this assay, the team of researchers In MGH measured the Minimal Inhibitory Concentration (MIC) for several antibiotics in less than 3 hours, significantly faster than the 48 hours needed for traditional methods. The report appears in the June 2017 issue of the journal *TECHNOLOGY*.

"Current methods for testing bacterial antibiotic sensitivity are time consuming and expensive. Recently, microfluidic approaches has been investigated as an alternative. Many of these methods however, have practical limitations because they require complicated and time-consuming pre-loading steps. In this work, we describe a bacteria culture system that requires no more than pipetting to set up, and in combination with standard microscopy provides MIC values and antibiotic sensitivity testing in three hours." says Associated Professor Daniel Irimia, MD, Ph.D., of Harvard Medical School and Massachusetts General Hospital and Principal Investigator on the paper.

The platform employs an array of 12 groups of 97 microwells, each with 40 μm diameter and 100 μm depth. It facilitates the "quantitative measurements from low-density bacterial samples and enables to distinguish variations of the growth rate for different classes of antibiotics." says Fatemeh Jalali, MS, the lead author on this paper. "Moreover, the rapid results make the assay an interesting candidate for replacing traditional antibiotic sensitivity testing tools."

The team from MGH is planning to use this new assay to investigate the changes in bacteria growth rate during the acquisition of antibiotic resistance and to the characterization of antibiotic sensitivity in microbiology samples from patients.

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