



Hydrogen Cell Culture Plate Allows Real Time Measurement of Cell Traction Forces

WPI

Hydrogel Cell Culture Plate Measures Cell Traction Forces

TITLE

Hydrogen Cell Culture Plate for Measuring Cell Traction Forces

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PATENT STATUS

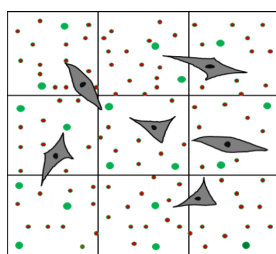
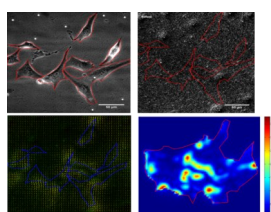
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LICENSING STATUS

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BACKGROUND

Cell traction forces (CTFs) - the traction forces generated by cells—play a major role in cell growth, proliferation, migration, invasion and disease progression. CTFs generated by cells is an indicator of cellular function. Therefore, study of CTFs allows real-time non-invasive evaluation of cell functions/status during long-term culture. Better understanding of these forces in response to various drugs and molecules can lead to the development of more effective drugs for various treatment.

Cell traction force microscopy (CTFM) is a well-established method to analyze CTFs. However, existing methods are deficient in that they do not allow real-time monitoring of CTFs during culture and require undesirable interventions during

SUMMARY

- A cell well includes polyacrylamide or other hydrogels coated with ECM proteins.
- A micro-grid pattern stamped or etched at the bottom of the slide and two different fluorescent beads embedded in the gel allows both the precise localization of cell(s) and measurement of gel deformation over multiple time points in real time.
- The combination of large green fluorescent beads and the micro-grid pattern allows the precise localization of the same cell(s) over the duration of the experiment.

ADVANTAGES

- Unlike current methods, the cells need not be removed during observation thus avoiding potential contamination of the cell culture.
- The same cell can be followed for an extensive period of time.
- Cost and time efficient, since the same culture is prepared and followed as opposed to preparing multiple cultures that need to be removed during observation.
- Gateway into better understanding of cell behavior; particularly in cancer research, wound repair, study of cytoskeletal behavior and drug