

High-Throughput Assays Using Laser to Induce Mechanotransduction in 3D and 2D Cell cultures

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BRIEF DESCRIPTION

Using pulsed laser radiation, University of California, Irvine researchers have developed a novel methodology to provide a mechanical agonist to single or multiple cells and stimulate cellular mechanotransduction. These researchers have also shown this laser methodology can be used in a high-throughput assay format in 3D and 2D cell cultures. The UCI researchers have shown that this technology is highly effective in eliciting a mechanotransduction response that can be modulated by inhibitors or activators of mechanotransduction signaling axes.

FULL DESCRIPTION

Mechanotransduction, the process by which cells convert mechanical stresses to a biochemical signal, influences many cell functions including cell motility and proliferation and also modulates cell signaling events in the regulation of sensory neurons and in various molecular pathways such as the Src family of nonreceptor tyrosine kinases, ion channels, and the extracellular signal-regulated kinases. Mechanotransduction plays a role in the regulation of blood pressure and the progression of a variety of diseases such as atherosclerosis and cancer. Current tools used to simulate physiological mechanical stresses on/in the cell include optical and magnetic tweezers, stretching devices and flow chambers. These methods are slow and may not be efficiently used in high throughput screening (HTS) methods due to the bulky equipment required for a single experiment.

SUGGESTED USES

This new laser methodology is easier to operate than existing technologies and also more compact. The method has been developed specifically to allow for the HTS of large compound libraries using existing imaging cytometers and without adding significant time to current screening practices. These factors allow this new method to be used in HTS screening for therapeutics and potential drug side effects in mechanotransduction diseases and other research applications in mechanotransduction research.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	10,156,561	12/18/2018	2013-233

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OTHER INFORMATION

KEYWORDS

Mechanotransduction

CATEGORIZED AS

- » **Biotechnology**
- » Other
- » **Imaging**
- » Other
- » **Medical**
- » Imaging
- » Research Tools
- » Screening
- » **Research Tools**
- » Screening Assays

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