

Boost your research with a high-speed DHM®



DHM® up to 100'000 fps confirms the mechanism of sonogenetics

In a seminal publication, the group of James Friend at [UCSD](#) discovers the mechanism of ultrasound causing ion channel activation underpinning [sonogenetics](#).

James' group measures with a Lyncée Tec [high-speed DHM®](#) membrane displacements of 150 nm and has developed a biomechanical model to relate these movements with changes in membrane voltage. It is validated with patch-clamp recordings on neurons.

This groundbreaking work, funded by the [W.M. Keck Foundation](#), provides a mechanism for both ultrasound-evoked neurostimulation and sonogenetic control.

RESEARCH ARTICLE

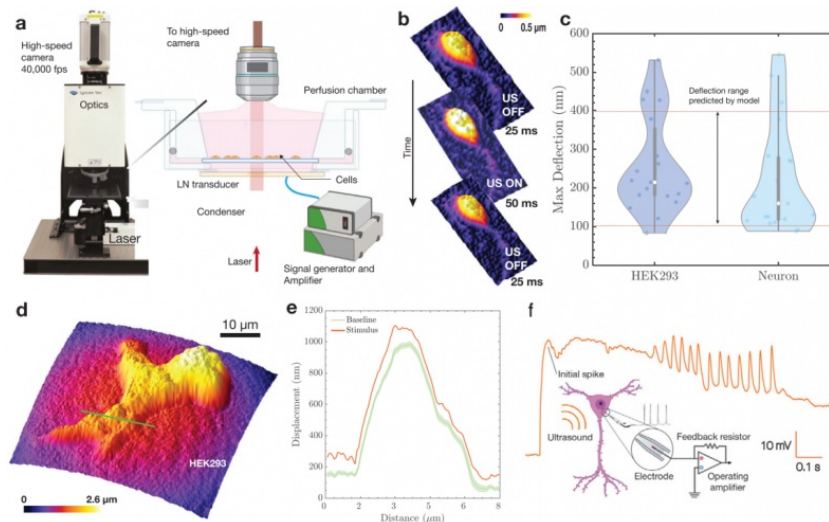
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Ultrasound Mediated Cellular Deflection Results in Cellular Depolarization

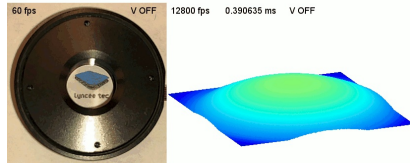
Aditya Vasan, Jeremy Orosco, Uri Magaram, Marc Duque, Connor Weiss, Yusuf Tufail, Sreekanth H Chalasani, and James Friend*

<https://doi.org/10.1002/advs.202101950>



High-speed DHM[®] imaging of membrane deflection

(a-d) A high-speed Digital Holographic Microscope (DHM[®]) measures the deflection of the membrane under the influence of ultrasound. (e) The measured membrane deflection corresponds to those predicted by the model. (f) *In vitro* current clamp electrophysiology on neurons validates that the displacement driven capacitance changes results in action potential generation.



Material sciences applications

High-speed imaging of a [tunable lens](#) when changing its applied voltage.

Lyncée Tec High-speed DHM[®]

The high-speed DHM[®] operates with the [FASTCAM NOVA](#) camera by Photron.

This system offers image acquisition rates up to 16'000 frames per second (fps) at megapixel resolution, 40'000 fps at a resolution of 512×512 pixels, and **116'000 fps** at 256×256 pixels.

[More info](#)



Testimonial of Professor James Friend University of California San Diego, USA

"We spoke with Frank, Yves, and the team at Lyncée Tec about the possibility of measuring the motion of fluid interfaces and cell membranes at frame rates many times higher than previous methods. Frank and Yves spent several hours with us on Zoom—and their group must have spent many more hours—to define the optics, camera, laser, and software all to tailor the digital holographic microscope to our unusual needs. Like any new instrument, we were anticipating many problems, yet when the system was delivered it was apparent from the moment the key was turned on that it just worked and that it would help us produce experimental data no one had seen before. After a period of adjustment to realize all that the DHM could tell us, we have been using it for a slew of applications far beyond our expectations".

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Do you want to discover our product while avoiding unnecessary travels and interactions during the COVID-19 situation?

For any DHM[®] purchase based on a remote live-demo, [Lyncée commits to plant trees](#) through the non-profit organization [OneTreePlanted](#) and to provide you with a certificate.

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