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Dr. Ronald Myers
Science Editor, *Journal of Visualized Experiments*

We are pleased to submit our manuscript, "**High-resolution imaging of nuclear dynamics in live cells under uniaxial tensile strain**" to be considered as an article in *Journal of Visualized Experiments*.

We have previously designed a device[1] to apply extracellular mechanical strain to adherent cells. The design of the elastomeric substratum in that work was sufficient for biochemical assays as well as low-resolution imaging of strained cells. In this work, we redesigned the substratum and introduced a novel imaging configuration that facilitates high resolution subcellular live cell imaging under applied strain. Here, we demonstrate the application of this new apparatus to probe the mechanism by which strain promotes differentiation of oligodendrocytes[2,3]. The high-resolution time lapse imaging of nuclei in strained and unstrained oligodendrocyte progenitor cells showed that mechanical tensile strain hastens the dampening of nuclear dynamics, consistent with accelerated cell differentiation. Our method has several advantages such as it can be fabricated simply, is small enough to fit inside tissue culture incubators as well as on top of microscope stages, and allows high-resolution optical imaging of any adherent cell type.

We believe that the *The Journal of Visualized Experiments* is an appropriate venue in which to publish this method, and look forward to your and the reviewers' response.

Sincerely,

Krystyn J. Van Vliet, Ph.D.

We would like to suggest the following reviewers:
1. Stephen Crocker, crocker@uchc.edu
2. Laura Feltri, mlfeltri@buffalo.edu
3. Patrizia Casaccia, Patrizia.Casaccia@asrc.cuny.edu
4. Carmen V. Melendez-Vasquez, melendez@genectr.hunter.cuny.edu
5. Jonah Chan, jonah.chan@ucsf.edu

References

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2. Jagielska, A. et al. Mechanical strain promotes oligodendrocyte differentiation by global changes of gene expression. Front. Cell. Neurosci. 11, 93 (2017).
3. Makhija, E. et al. Mechanical strain alters cellular and nuclear dynamics at early stages of oligodendrocyte differentiation. Front. Cell. Neurosci. 12, 59 (2018).