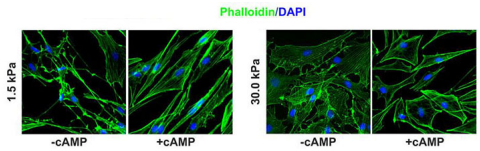

Work in **Prof Carmen Melendez's** lab has recently been published in the journal Scientific Reports

Myelinating glia differentiation is regulated by extracellular matrix elasticity

Mateusz M. Urbanski, Lyle Kingsbury, Daniel Moussouros, Imran Kassim, Saraf Mehjabeen, Navid Paknejad & Carmen V. Melendez-Vasquez.

This work was also recently mentioned in CUNY's Septermber Faculty News article: New Research on Myelinating Glia Provides Insights for Regenerative Medicine

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Below is abstract of the article and a link to download a PDF

Abstract

The mechanical properties of living tissues have a significant impact on cell differentiation, but remain unexplored in the context of myelin formation and repair. In the PNS, the extracellular matrix (ECM) incorporates a basal lamina significantly denser than the loosely organized CNS matrix. Inhibition of non-muscle myosin II (NMII) enhances central but impairs peripheral myelination and NMII has been implicated in cellular responses to changes in the elasticity of the ECM. To directly evaluate whether mechanotransduction plays a role in glial cell differentiation, we cultured Schwann cells (SC) and oligodendrocytes (OL) on matrices of variable elastic modulus, mimicking either their native environment or conditions found in injured tissue. We found that a rigid, lesion-like matrix inhibited branching and differentiation of OL in NMII-dependent manner. By contrast, SC developed normally in both soft and stiffer matrices. Although SC differentiation was not significantly affected by changes in matrix stiffness alone, we found that expression of Krox-20 was potentiated on rigid matrices at high laminin concentration. These findings are relevant to the design of biomaterials to promote healing and regeneration in both CNS and PNS, via transplantation of glial progenitors or the implantation of tissue scaffolds.

Link to PDF: http://www.nature.com/articles/srep33751.pdf