

Mesenchymal Stem Cell Response to Static Stretch on Electrospun Nanofibrous Scaffold

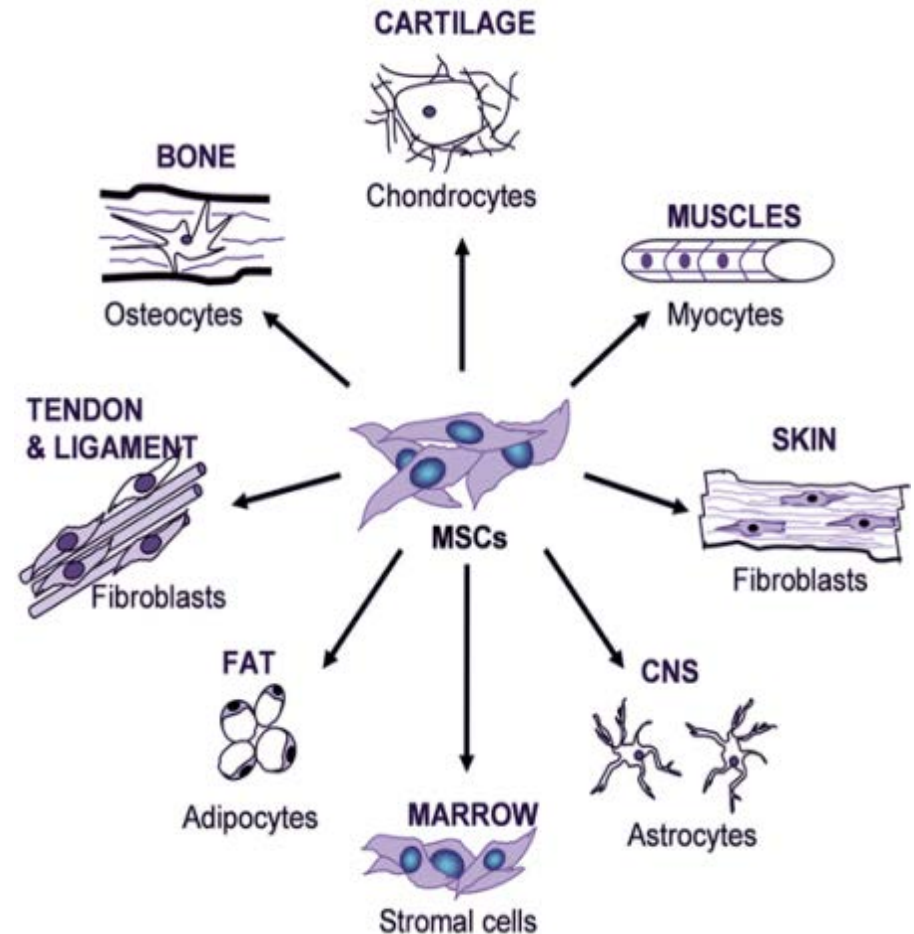
Ty'Quish Keyes



Background: MSCs

Mesenchymal Stem Cells(MSCs):

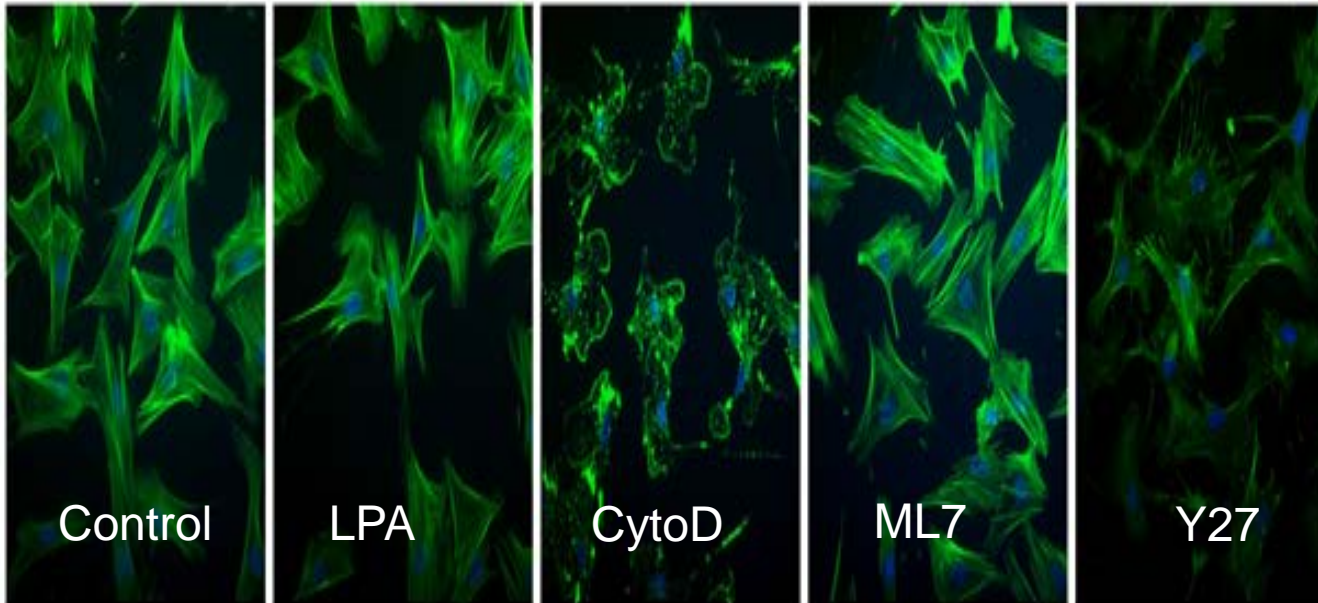
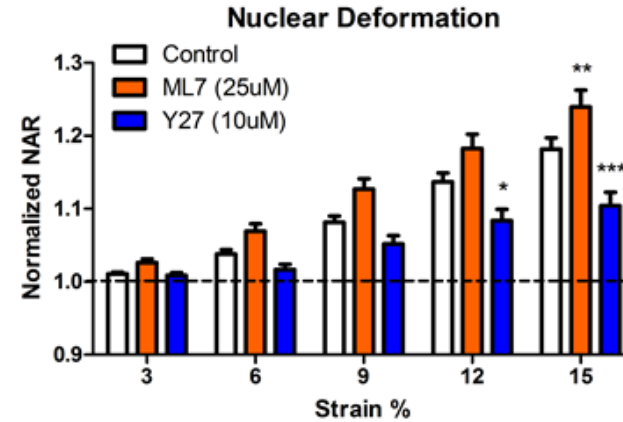
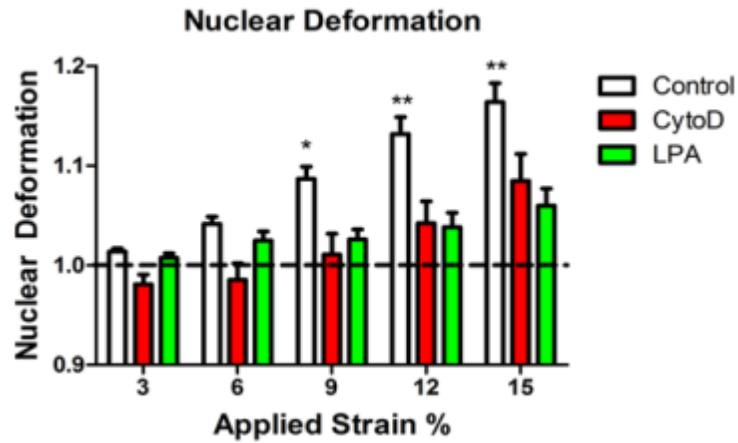
- ◆ multipotent stem cells
- ◆ considered for many therapeutic practices
 - differentiate
 - trophic and anti-inflammatory effects
- ◆ contribute to healing and tissue regeneration.
- ◆ Affected by the growth factors they encounter as well as the physical cues from their cellular microenvironment



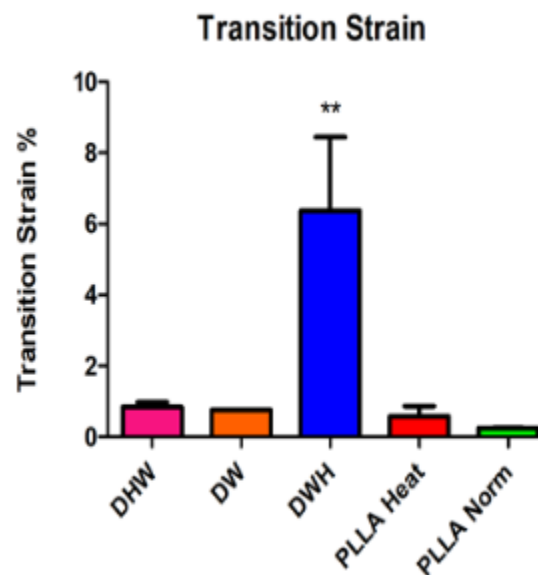
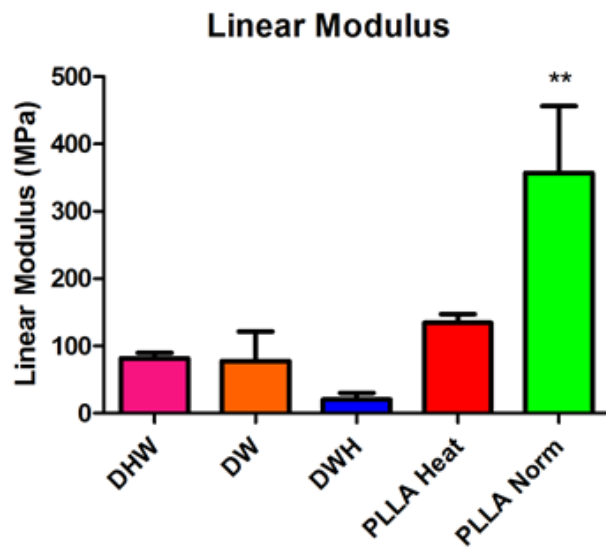
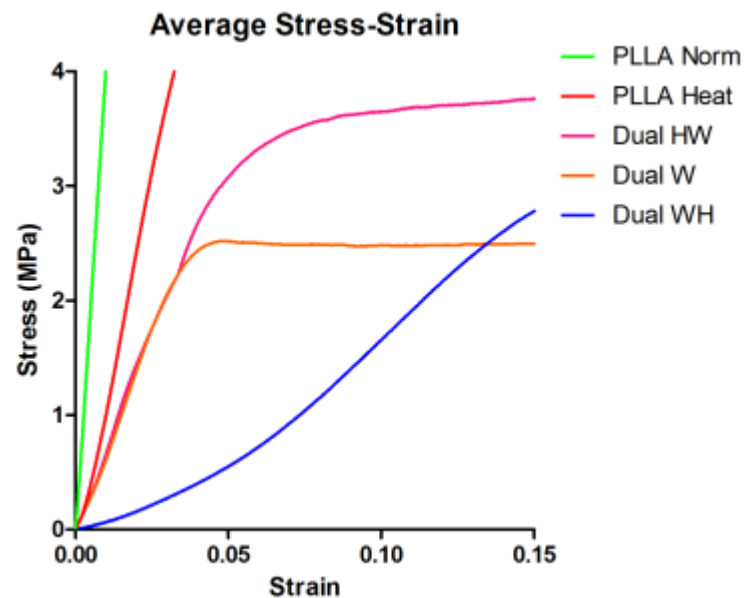
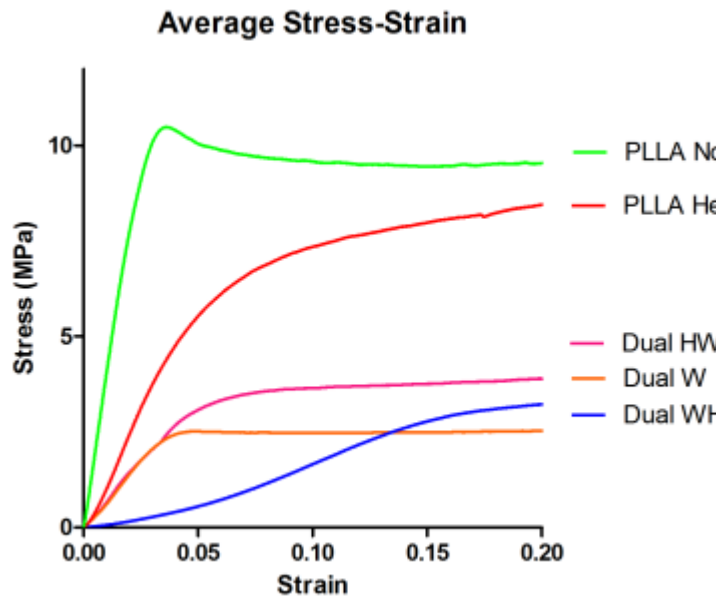
Goal

- ◆ **To investigate the role of contractility in MSCs mechanotransduction**
- ◆ **seeding of polymer nanofibrous scaffolds.**
- ◆ **Contractility**
 - Inhibitors or activators
- ◆ **Investigate mechanical properties and microscale strains of crimped v. uncrimped PLLA scaffolds**

Results



Results



Conclusions

- ◆ **Increasing contractility prevents nuclear deformation**
 - LPA
- ◆ **Inhibiting the contractility and the actin cytoskeleton further prevent nuclear deformation**
 - Y27632 or Cytochalasin D (CytoD)
- ◆ **Decreasing contractility without disrupting actin increases nuclear deformation**
 - ML7

Thank You

- ◆ **Tristan Driscoll**
- ◆ **Robert Mauck, PhD**
- ◆ **Entire McKay Lab!**
- ◆ **SUNFEST**