

The Role of the Extracellular Matrix in Spinal Cord Inflammation

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Neurological Surgery Summer Student Program

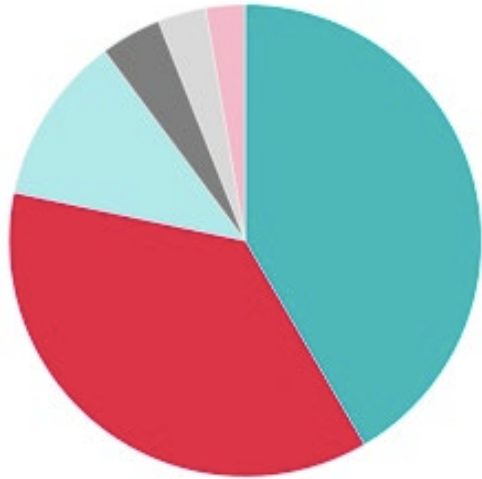
August 10th, 2018



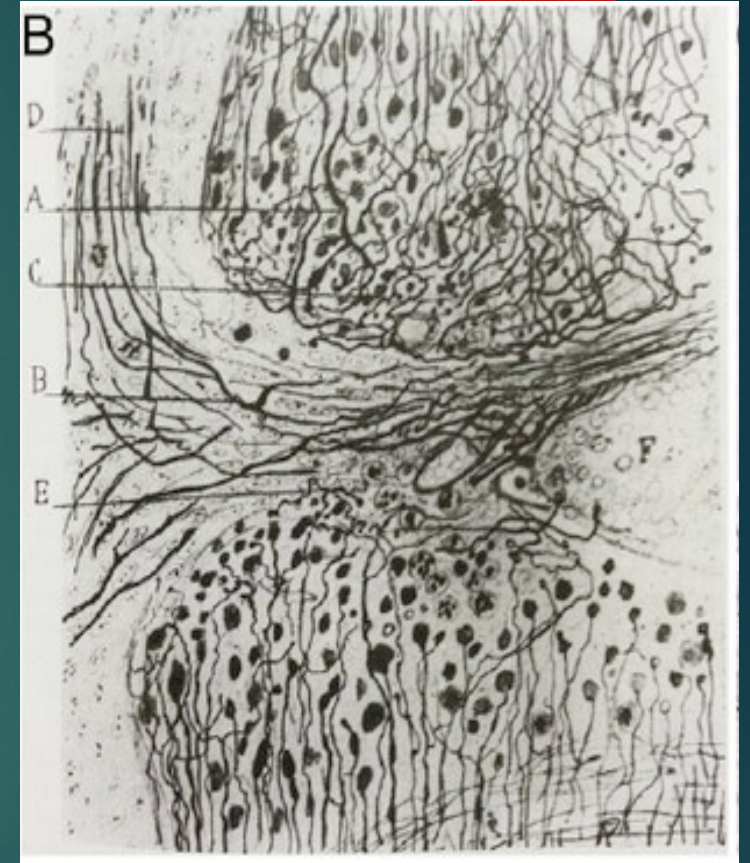
Why study SCI?

Most common causes of spinal cord injury

Road traffic accidents
Sport and recreational activities
Falls

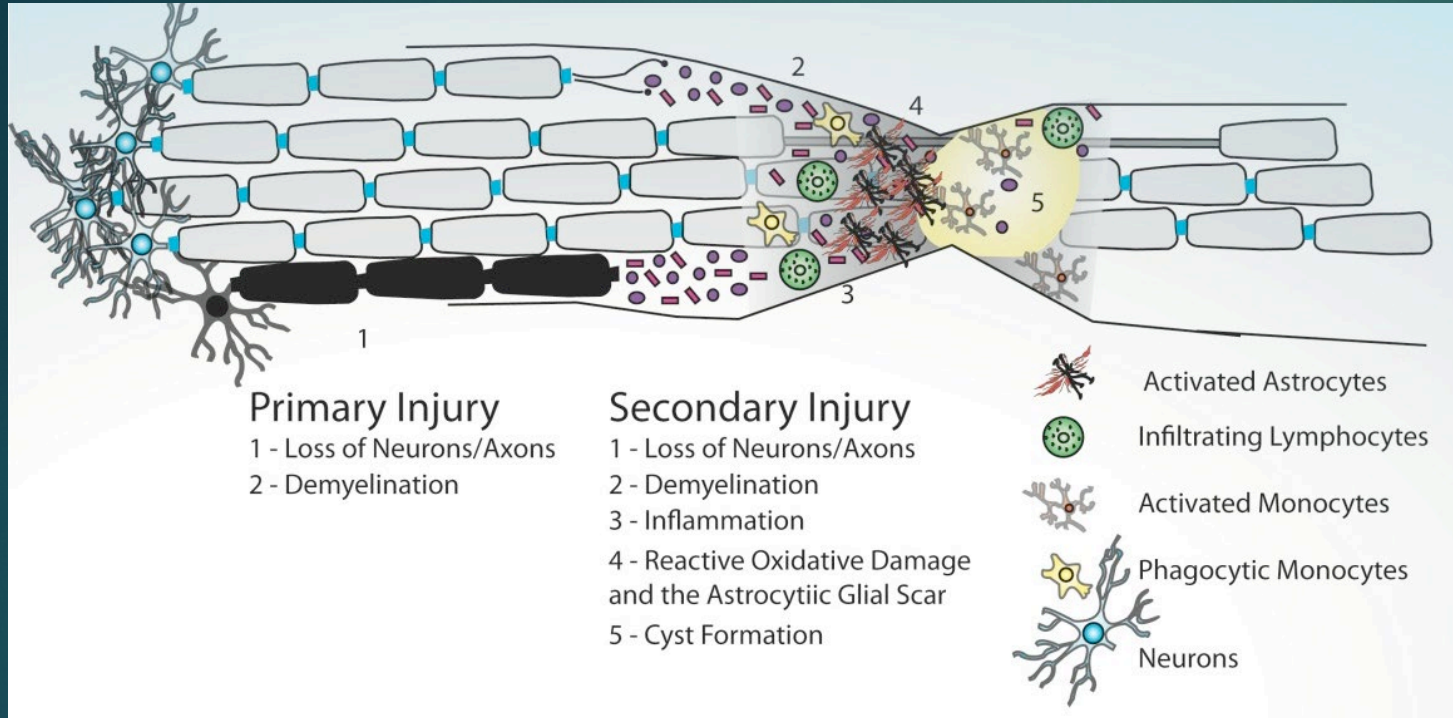


41.7% Fall
36.8% Road Traffic Accident
11.6% Sport
4.2% Knocked Over/Collision/Lifting
3.3% Trauma (unspecified)
2.7% Sharp Trauma/Assault



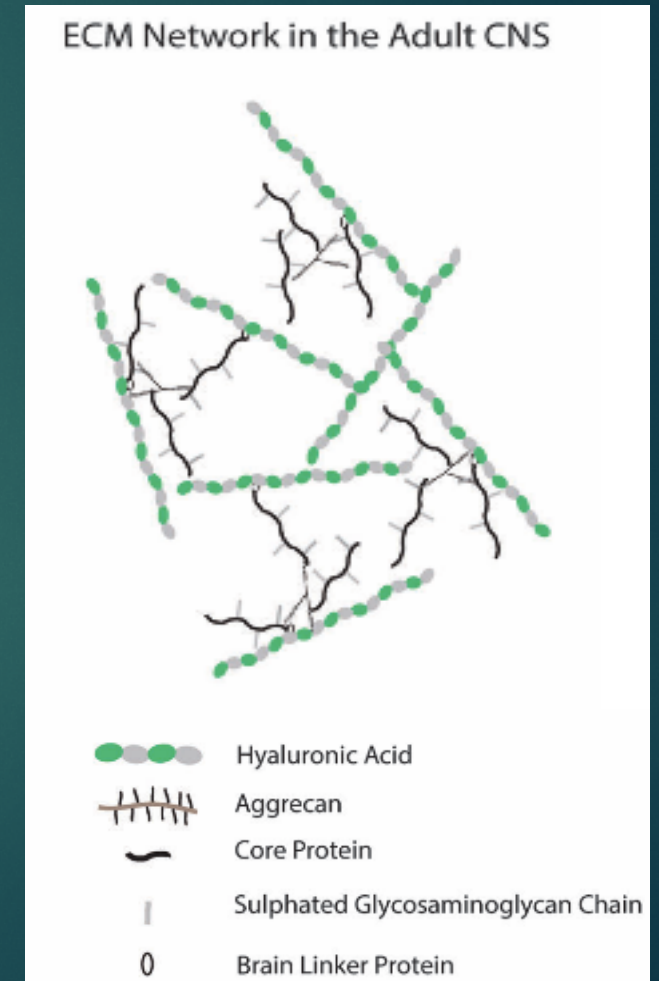
- ▶ 1.6 million folks with spinal cord dysfunction
- ▶ Spinal cord tissue does not repair itself

Inflammation and ECM degradation



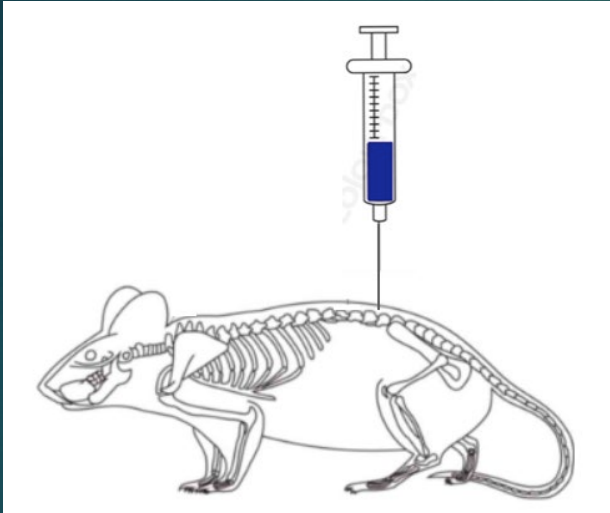
- Inflammation is not fully resolved after SCI in CNS
- After injury, inflammation and ECM degradation are observed.

- Hyaluronic Acid (HA): backbone of extracellular matrix



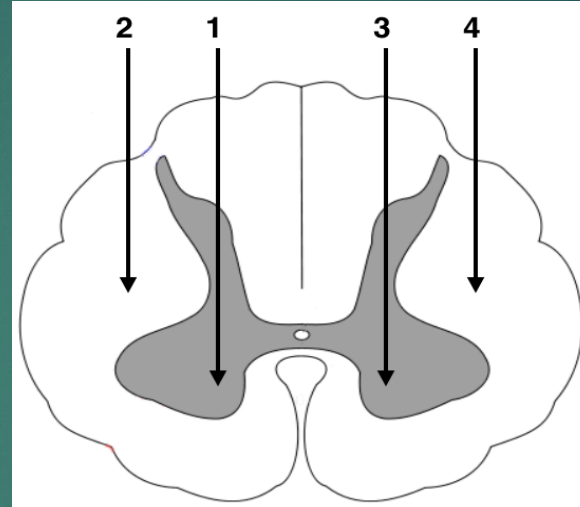
Experimental design

- ▶ - Sample size: 6-- Active Hyase (4), Heat-inactivated Hyase (2)



Injection at T8-T9

- Pulled pipette
- Less than 100 microns in diameter
- Slow infusion



4 injection sites on same lateral plane.



Tissue collection

Sectioning

Immuno-staining

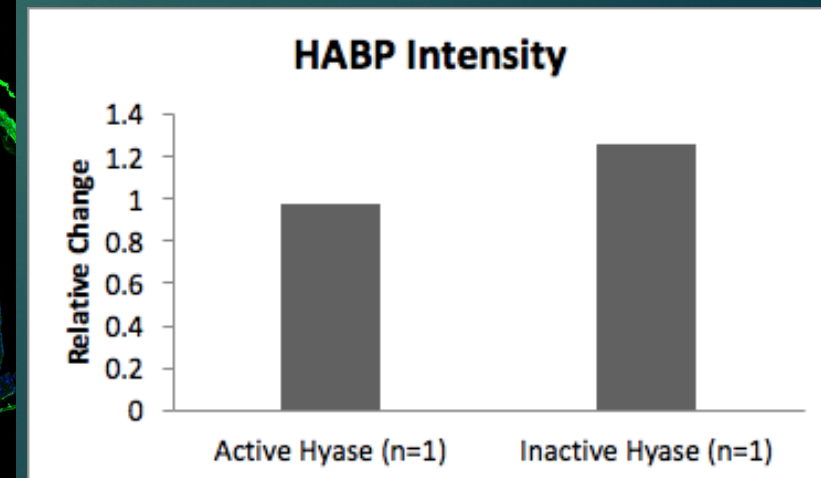
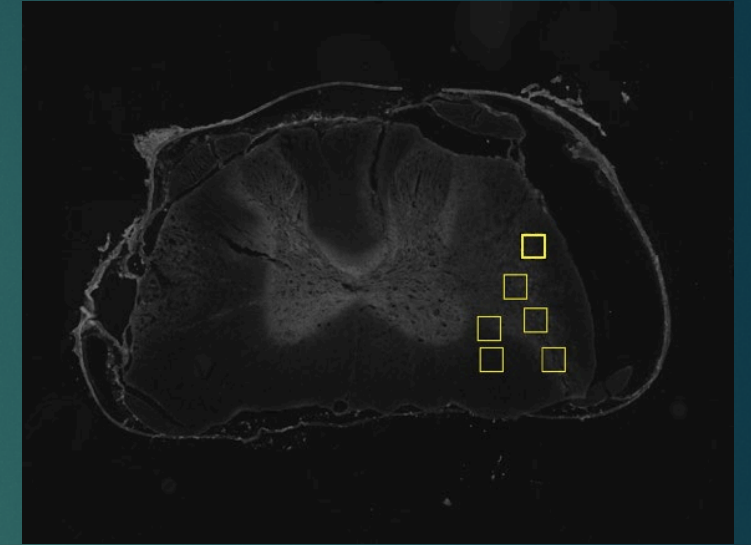
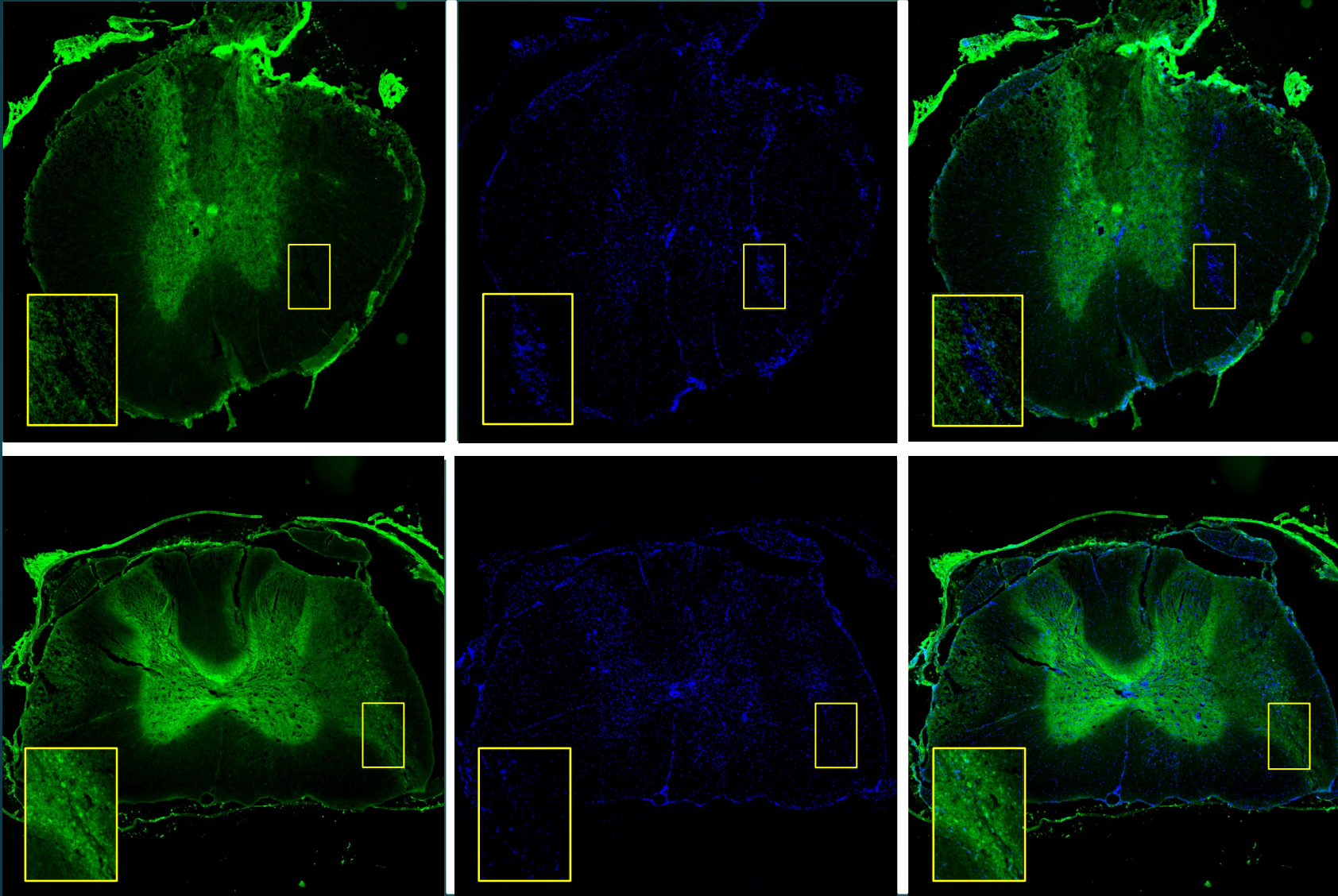
ECM degradation

Inflammation

Cell proliferation

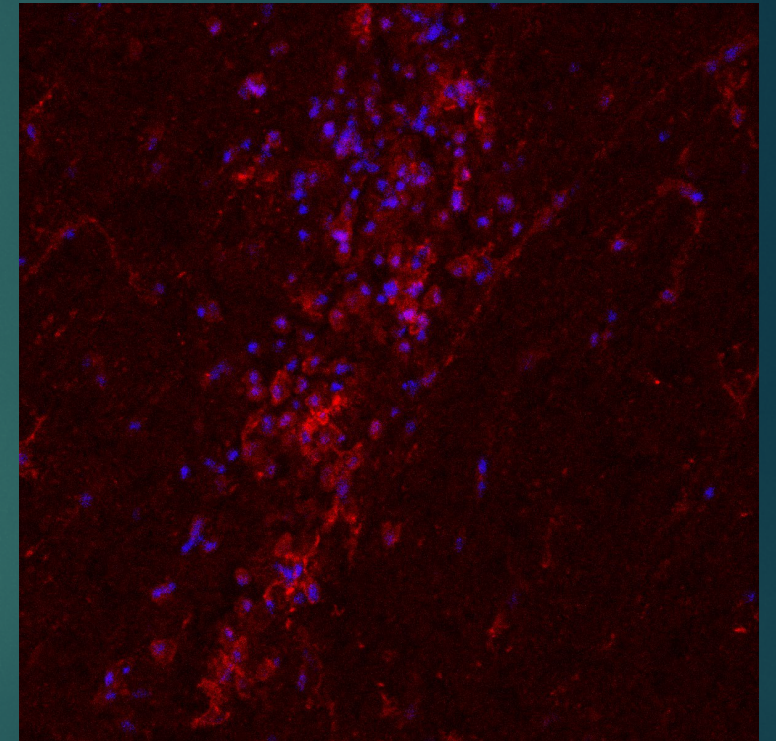
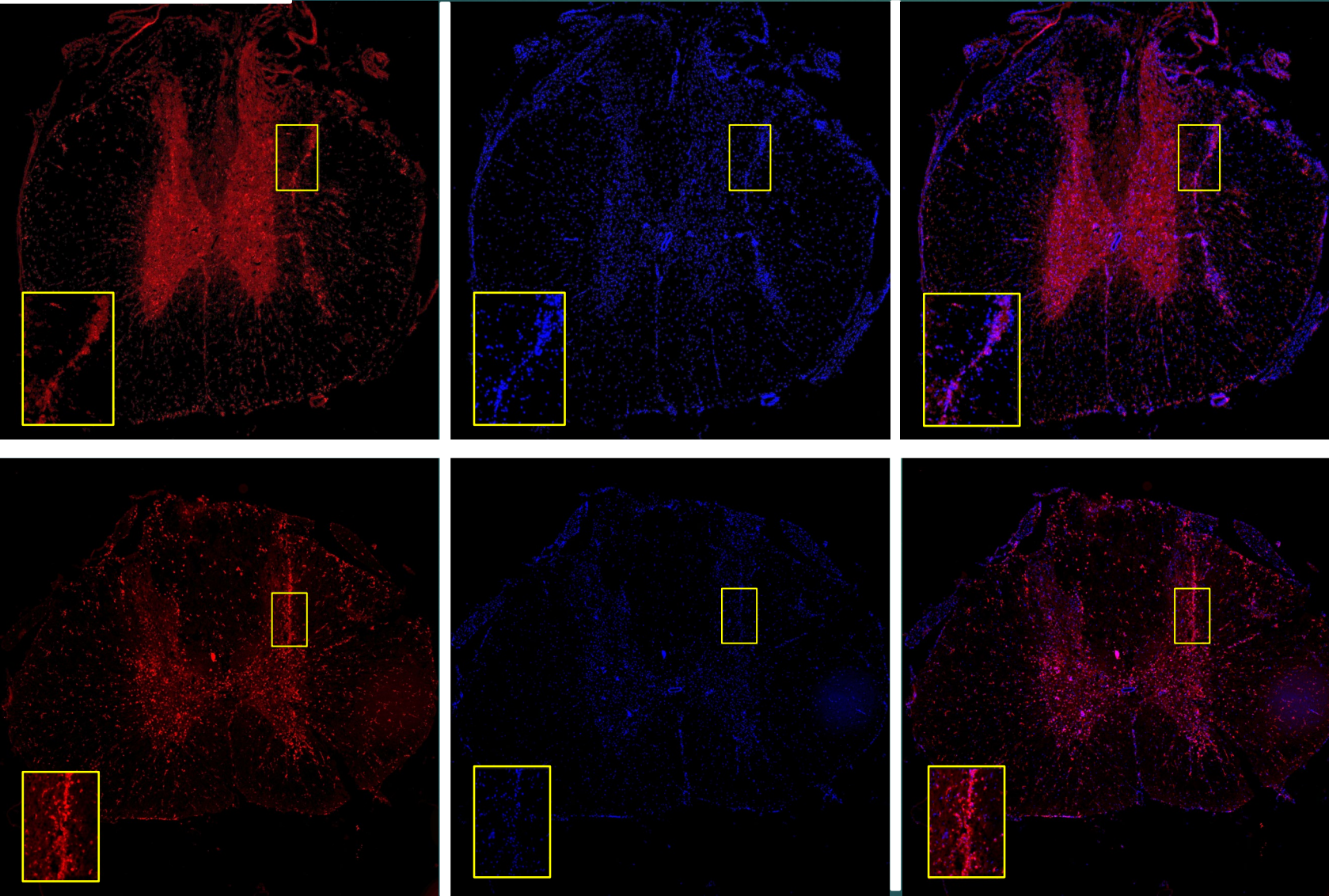
ECM Degradation

HABP/DAPI

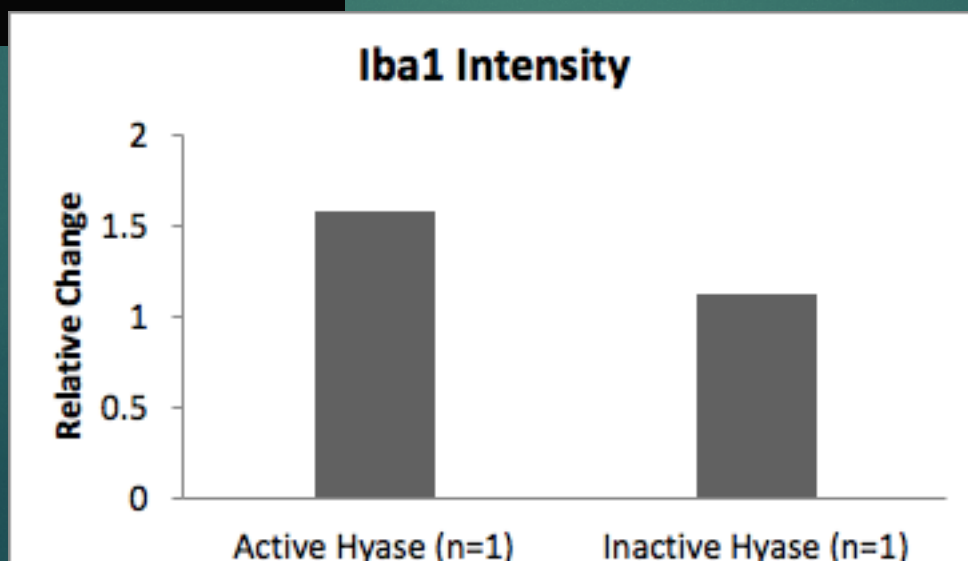
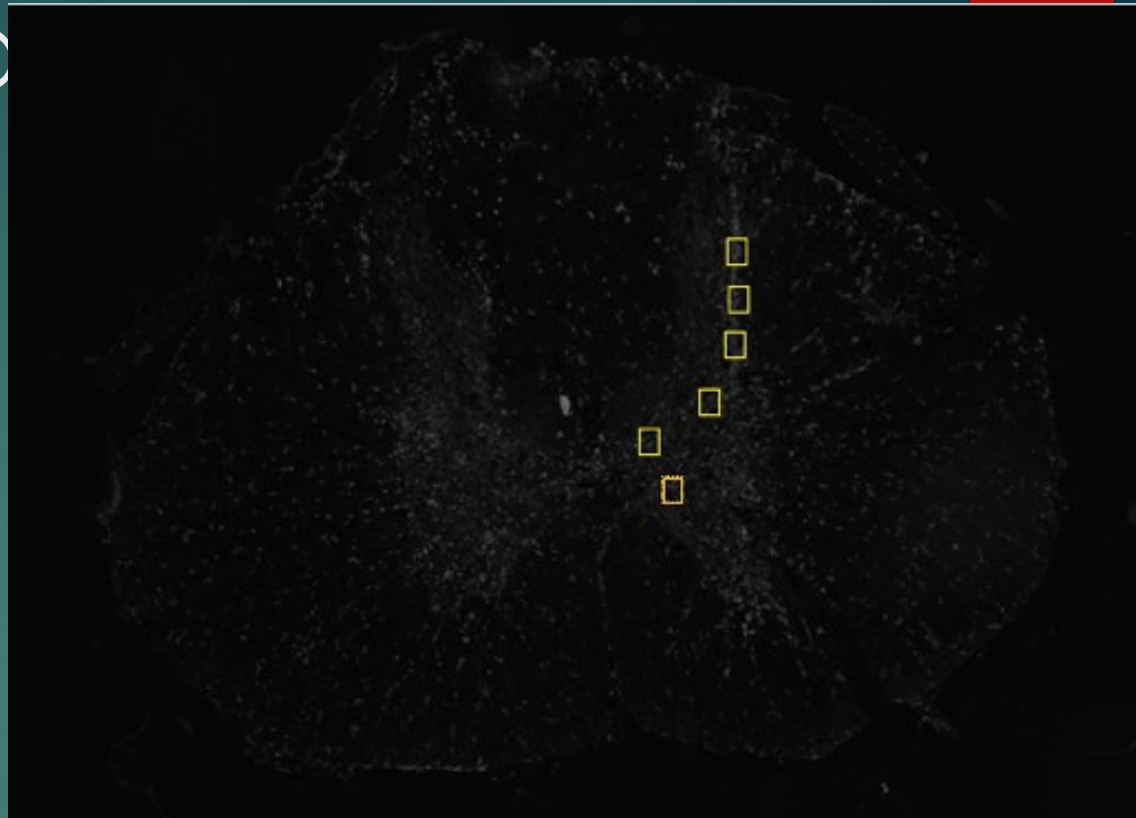
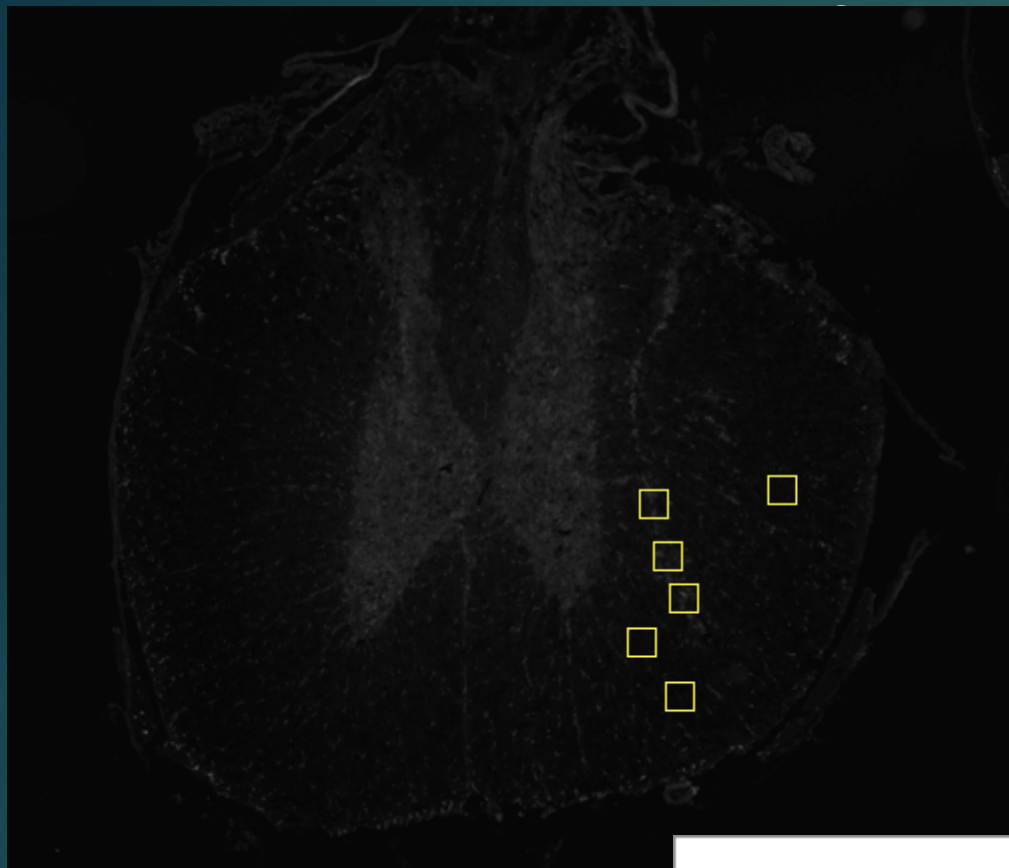


Inflammation

Iba1/DAPI

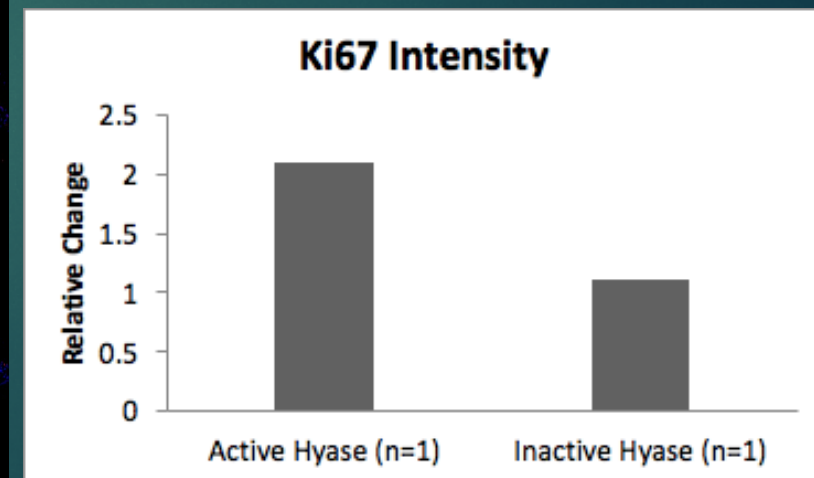
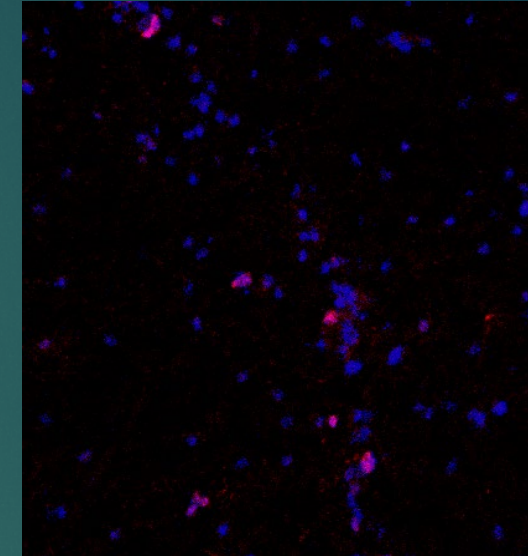
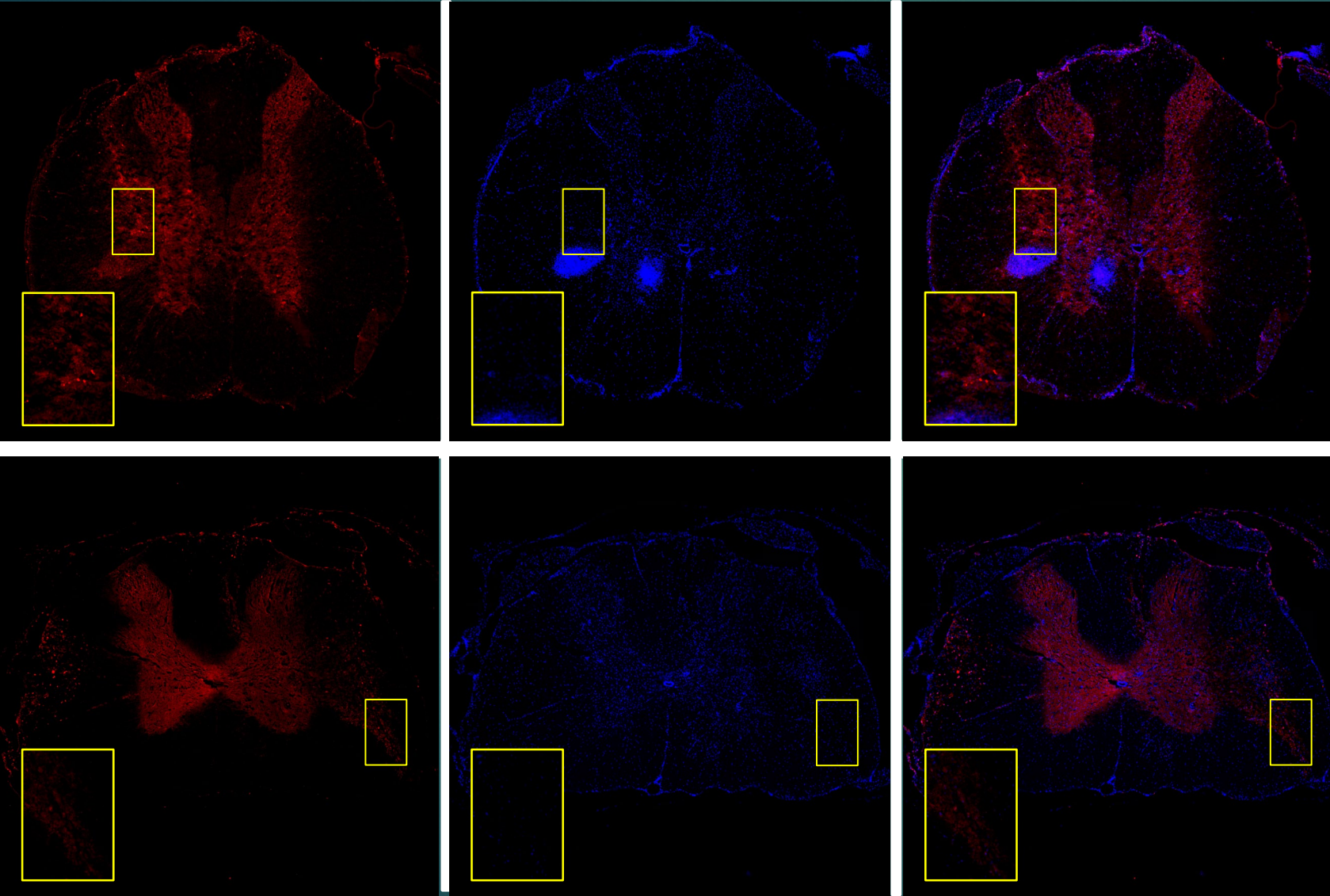


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Cell Proliferation

Ki67/DAPI



Conclusion/Future Directions

- ▶ ECM degradation may induce inflammation
- ▶ Source of error: small sample size in preliminary data analysis
- ▶ Project data analysis is ongoing
- ▶ Identification of proliferating cells
- ▶ Decipher the pathway

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