

# Critical Issues in Neuro-Rehabilitation

Daniel Becker, M.D.



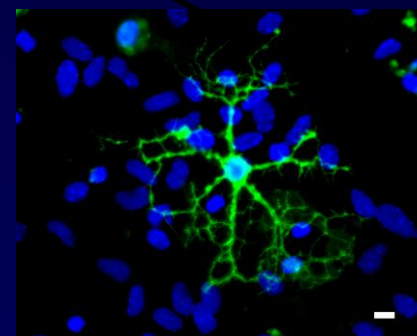
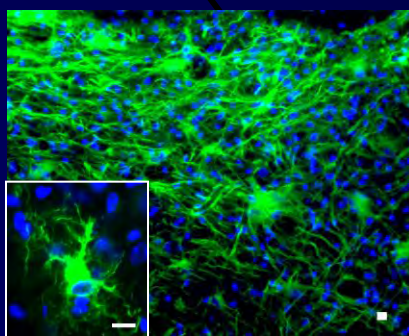
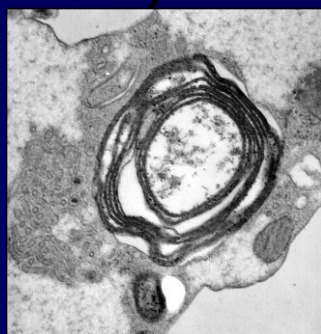
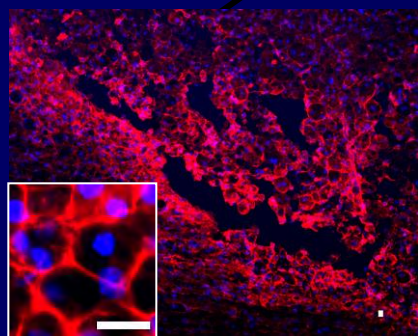
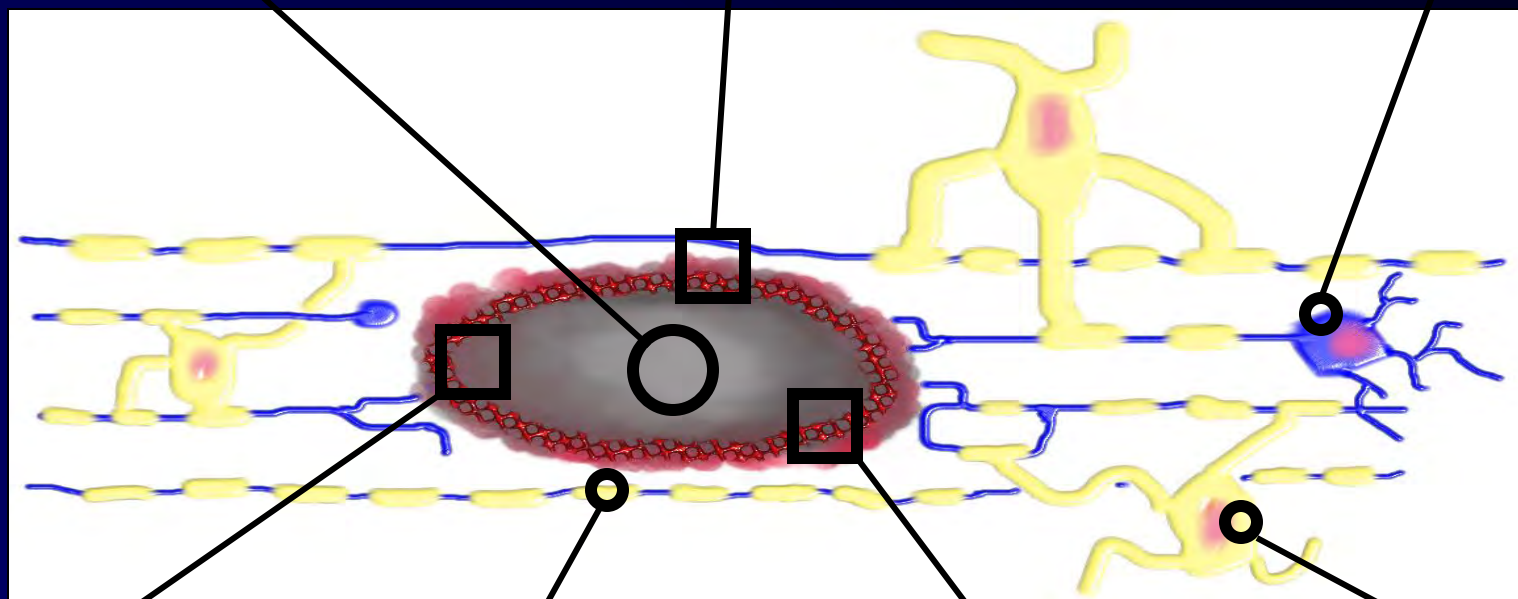
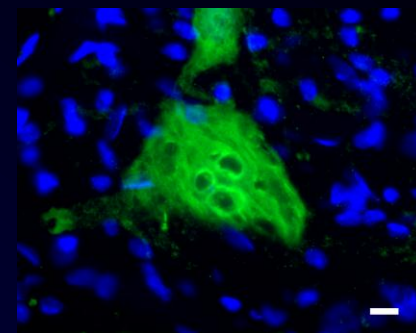
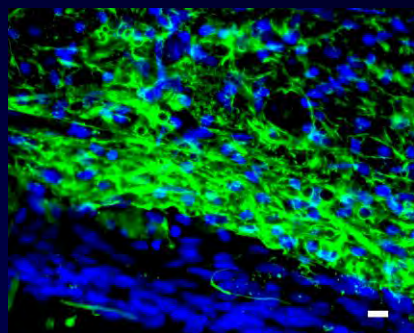
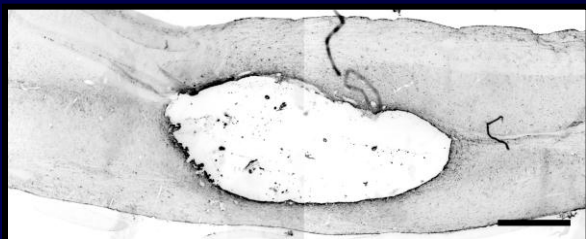
JOHNS HOPKINS  
MEDICINE



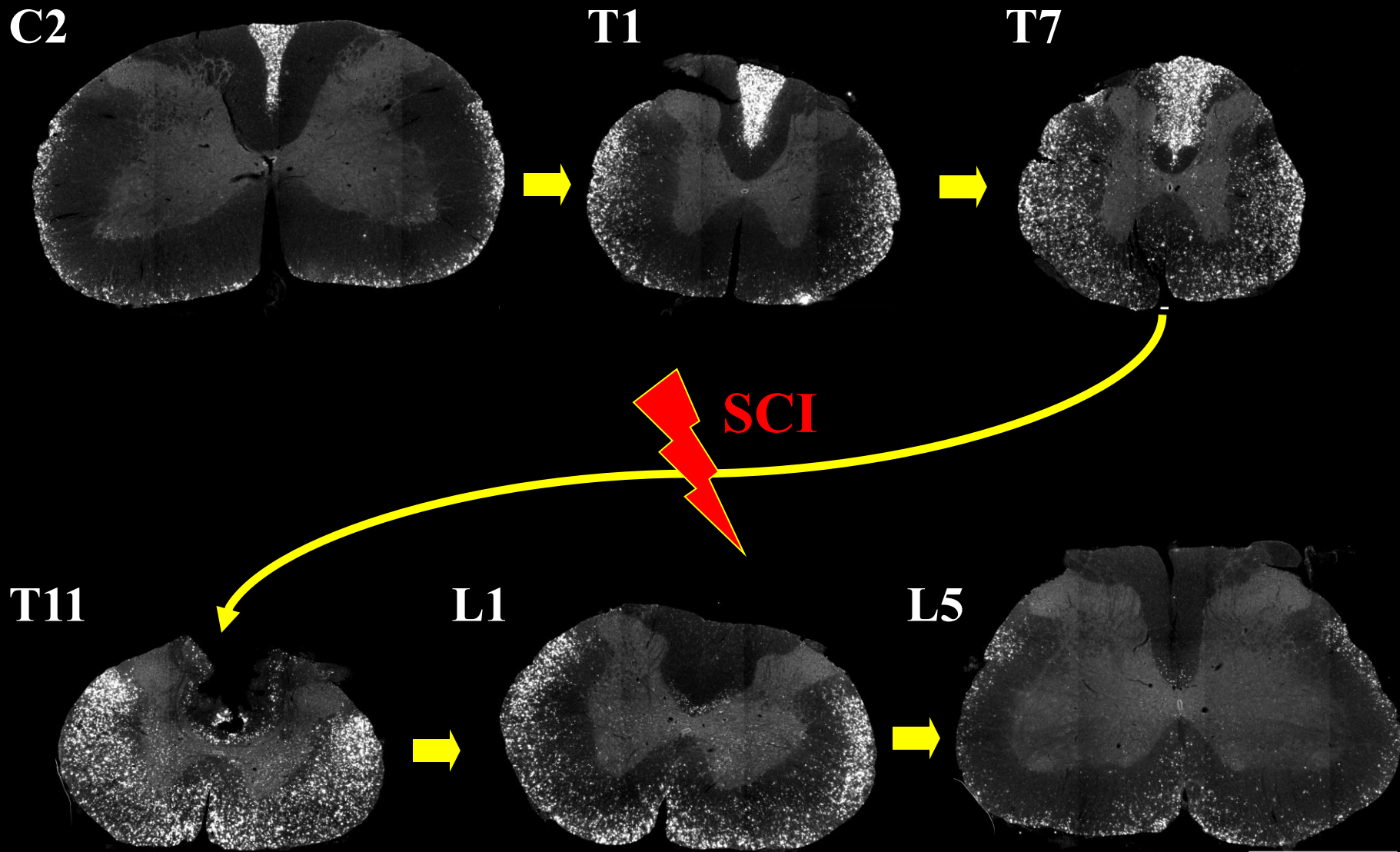
International Center for Spinal Cord Injury  
at Kennedy Krieger Institute  
Research. Restoration. Recovery.

# Important Concepts

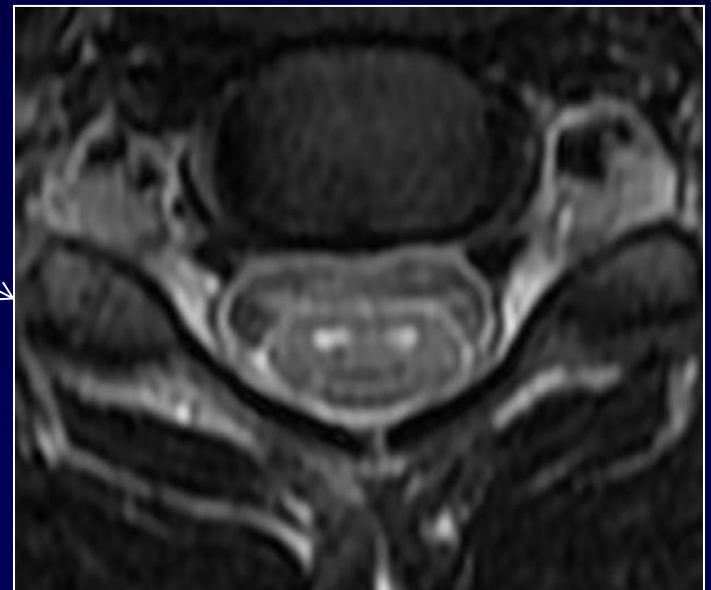
**TM = Spinal Cord Injury**



# Macrophage location 5 weeks after SCI



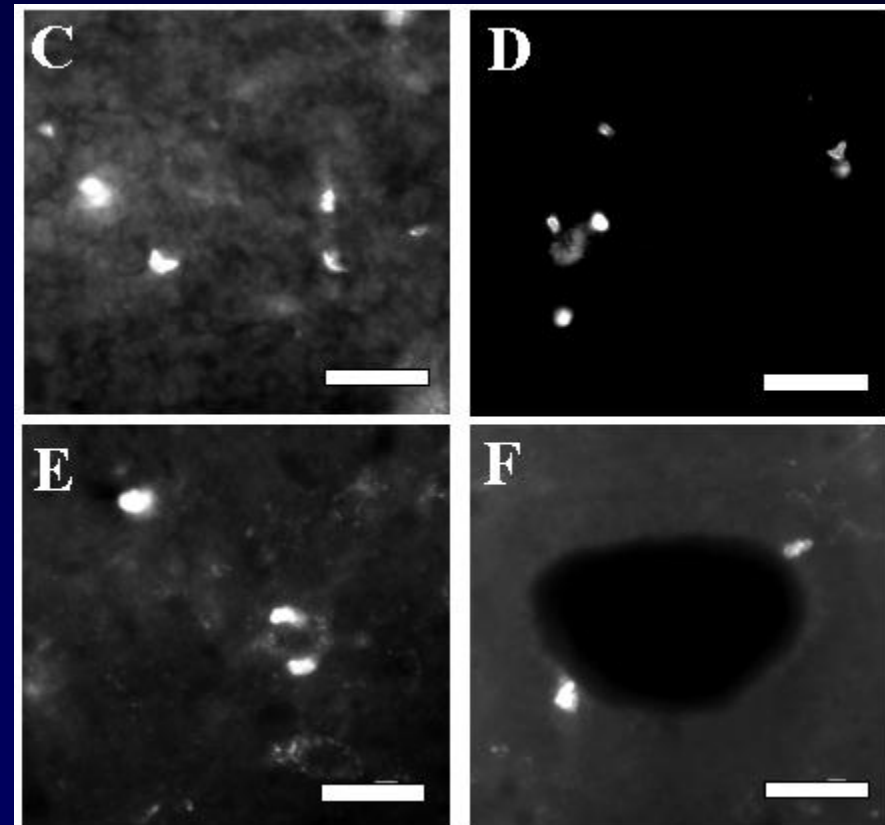
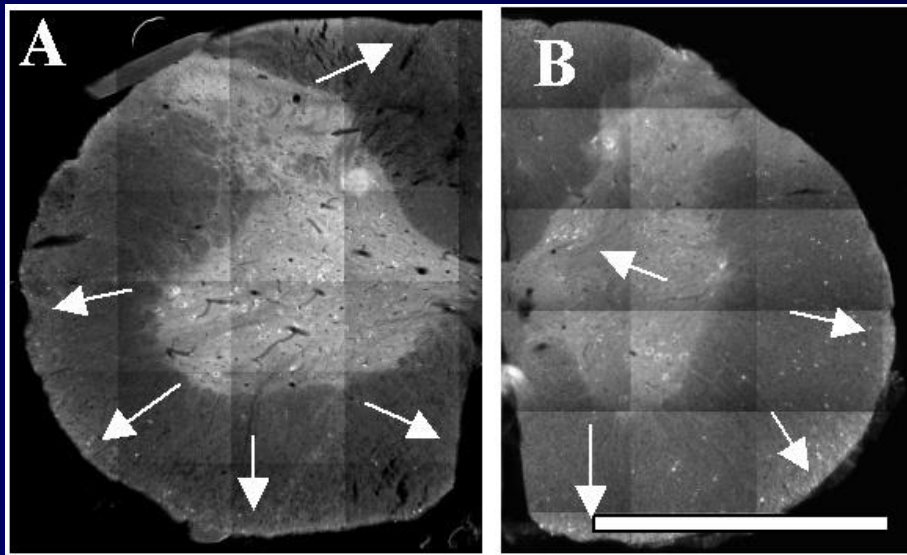
# How much repair is needed?



10 y/o WF  
12 months  
after acute  
TM

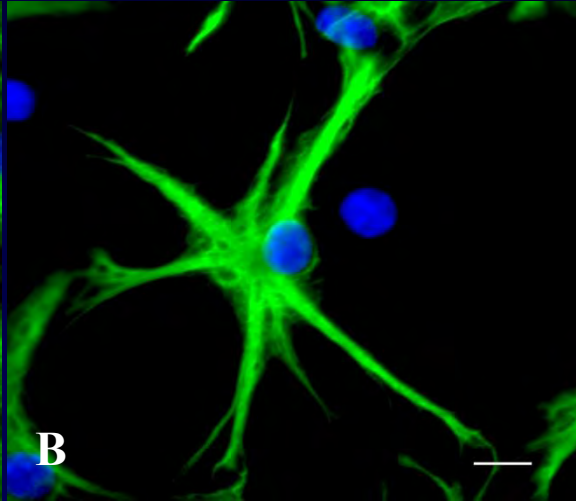
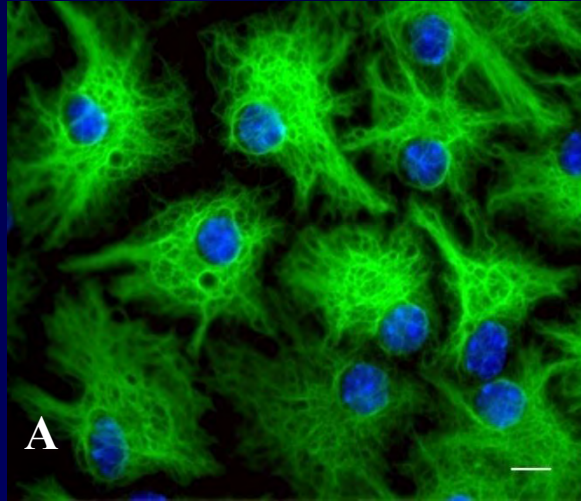
# Spontaneous Regeneration Occurs

- Endogenous stem cells are capable of giving rise to neural cells.

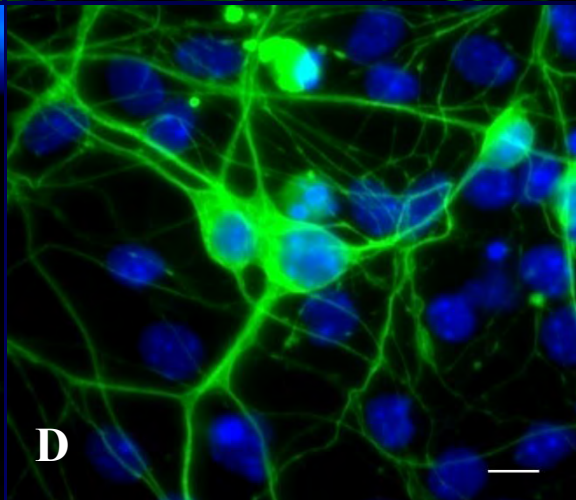
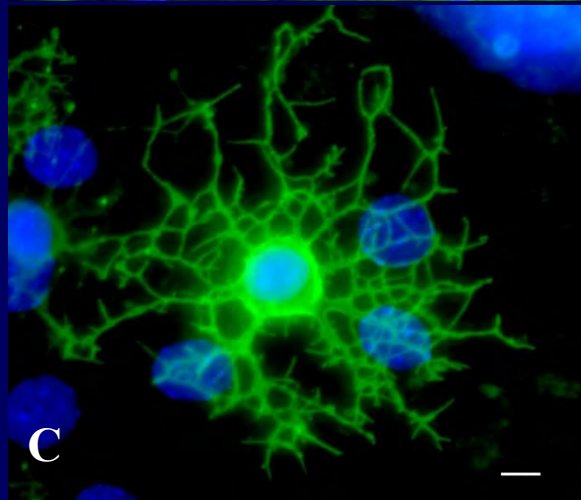


# Stem Cell Differentiation

Astrocyte



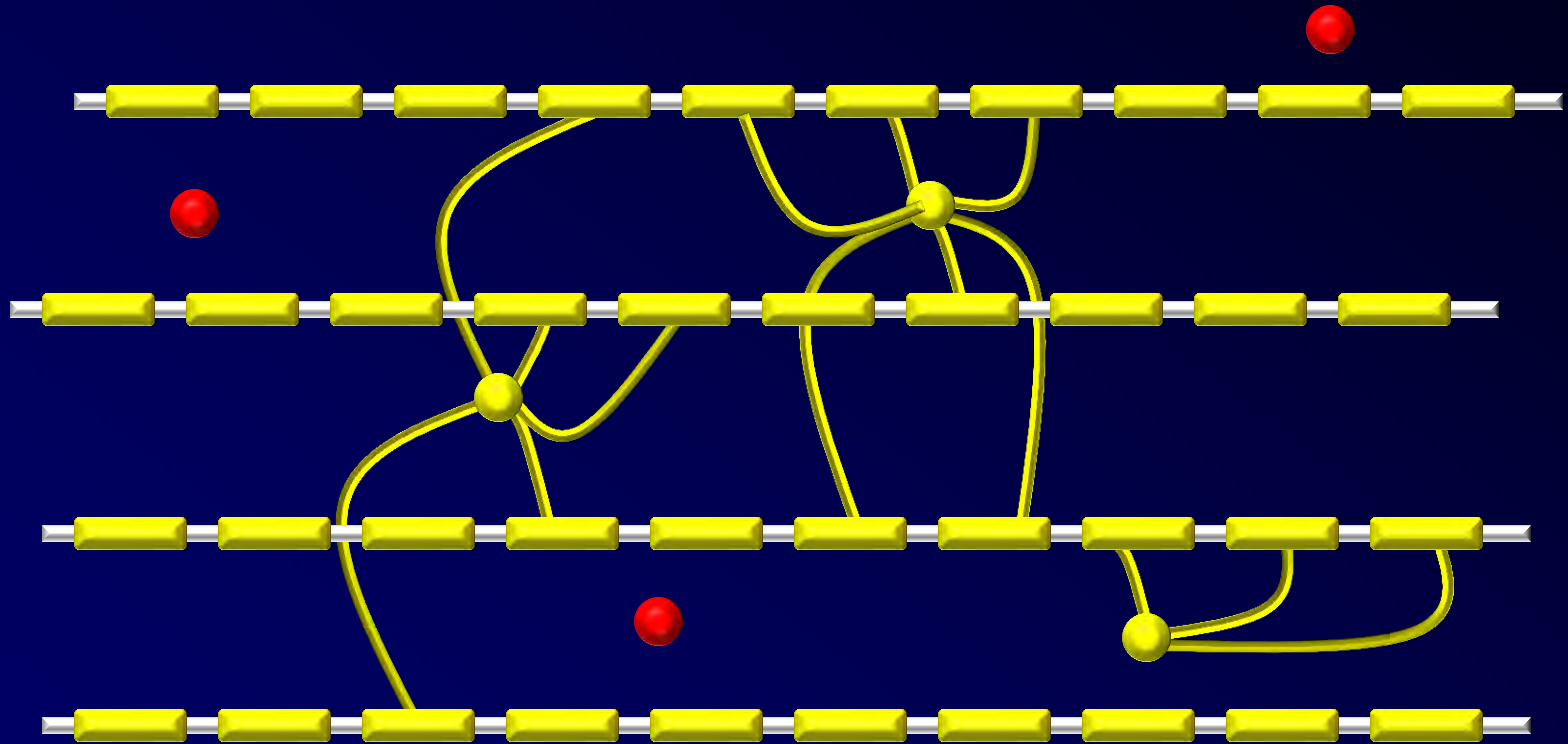
Oligodendrocyte



Neuron

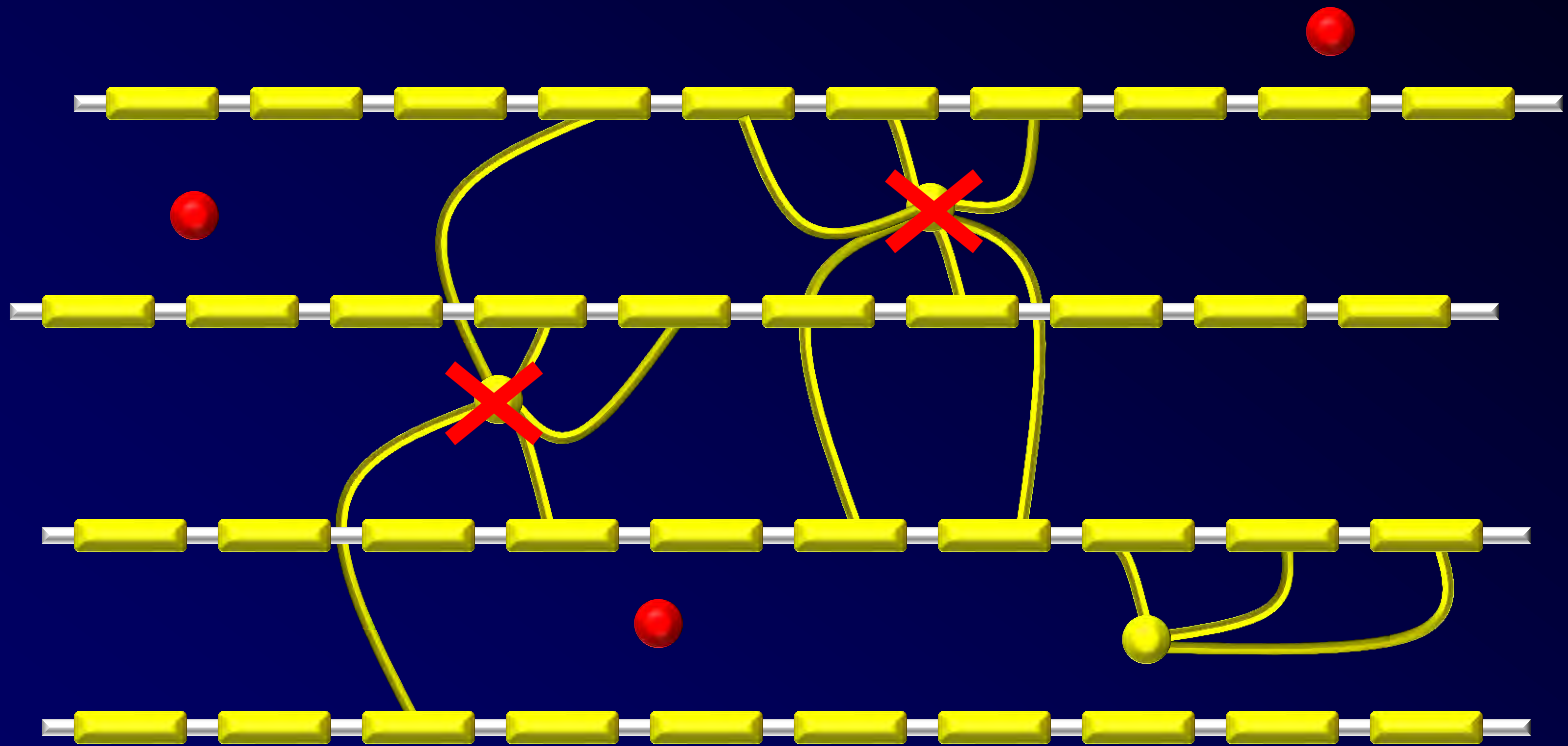


# What do the stem cells need in order to do their repair job?



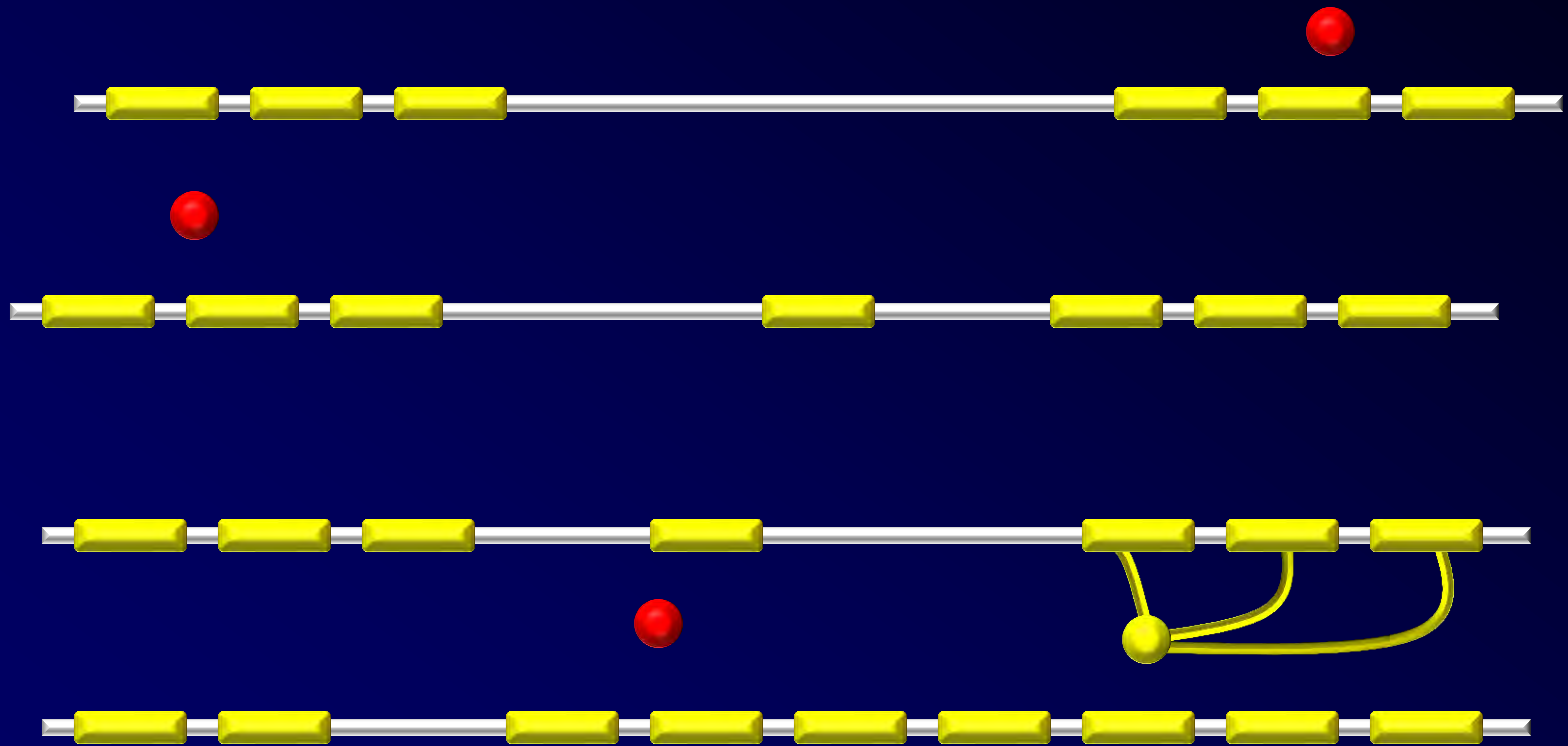
● Oligodendrocyte

● Stem Cell



● Oligodendrocyte

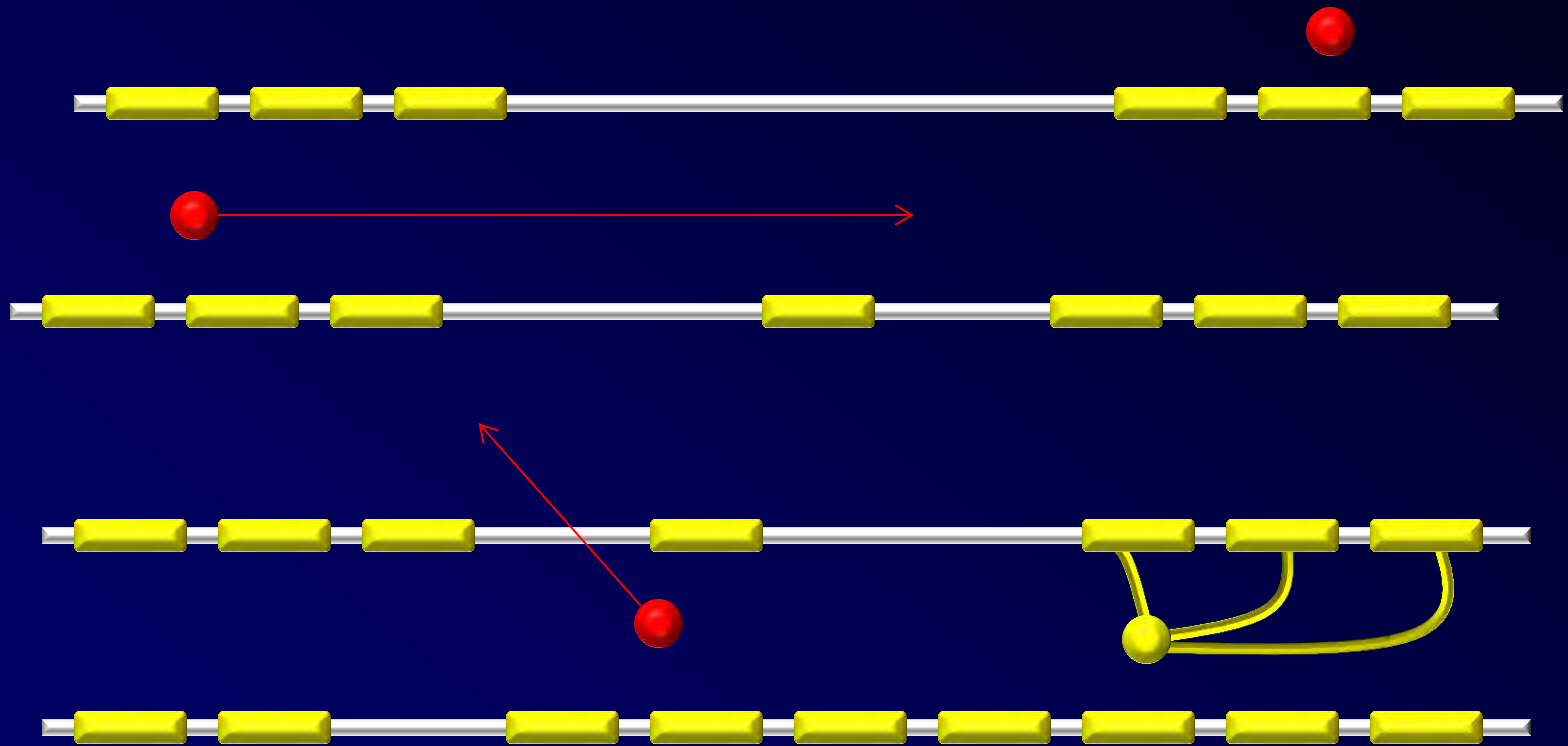
● Stem Cell



● Oligodendrocyte

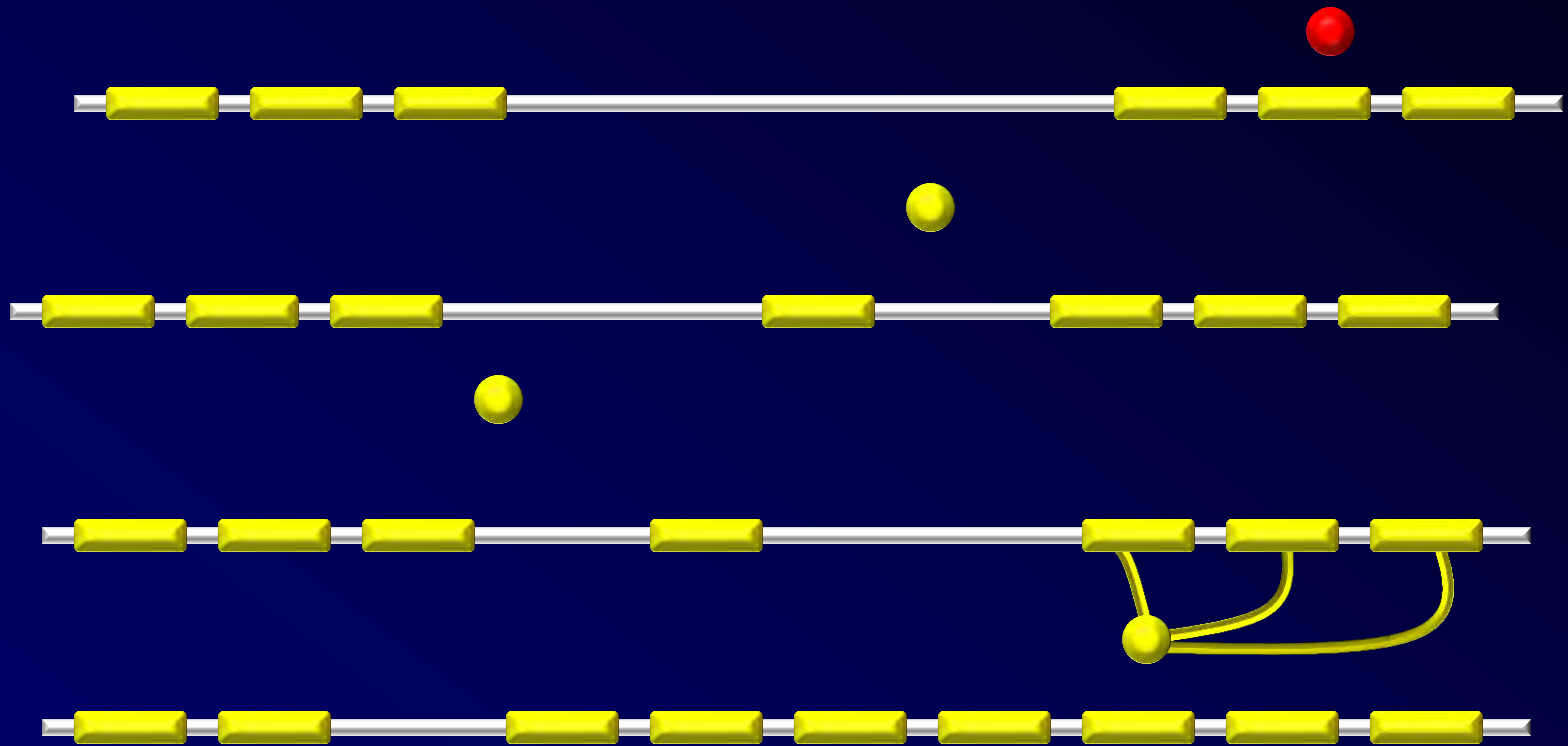
● Stem Cell

**They should do the following...**



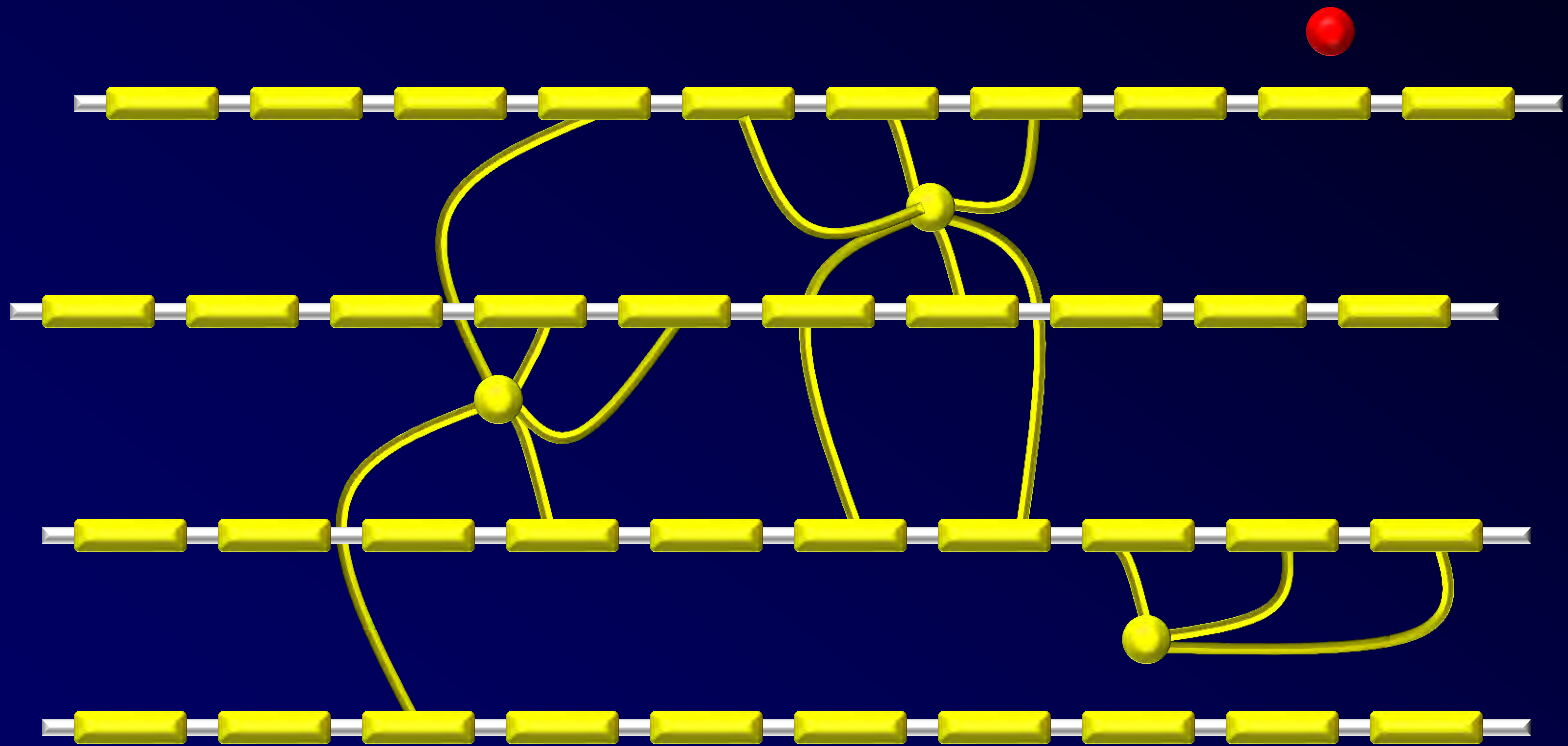
● Oligodendrocyte

● Stem Cell



● Oligodendrocyte

● Stem Cell



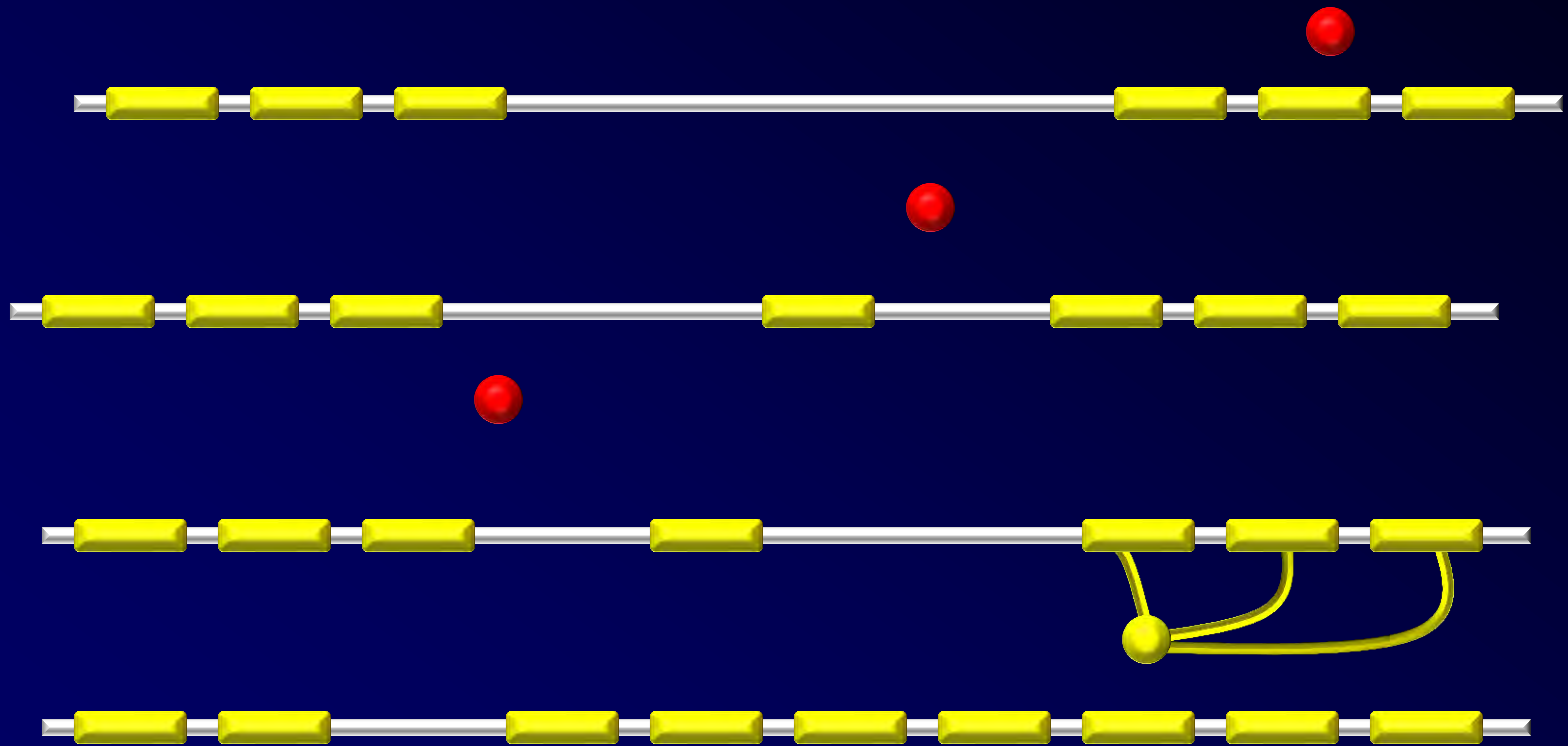
● Oligodendrocyte

● Stem Cell

**BUT, they don't...**

**Instead...**

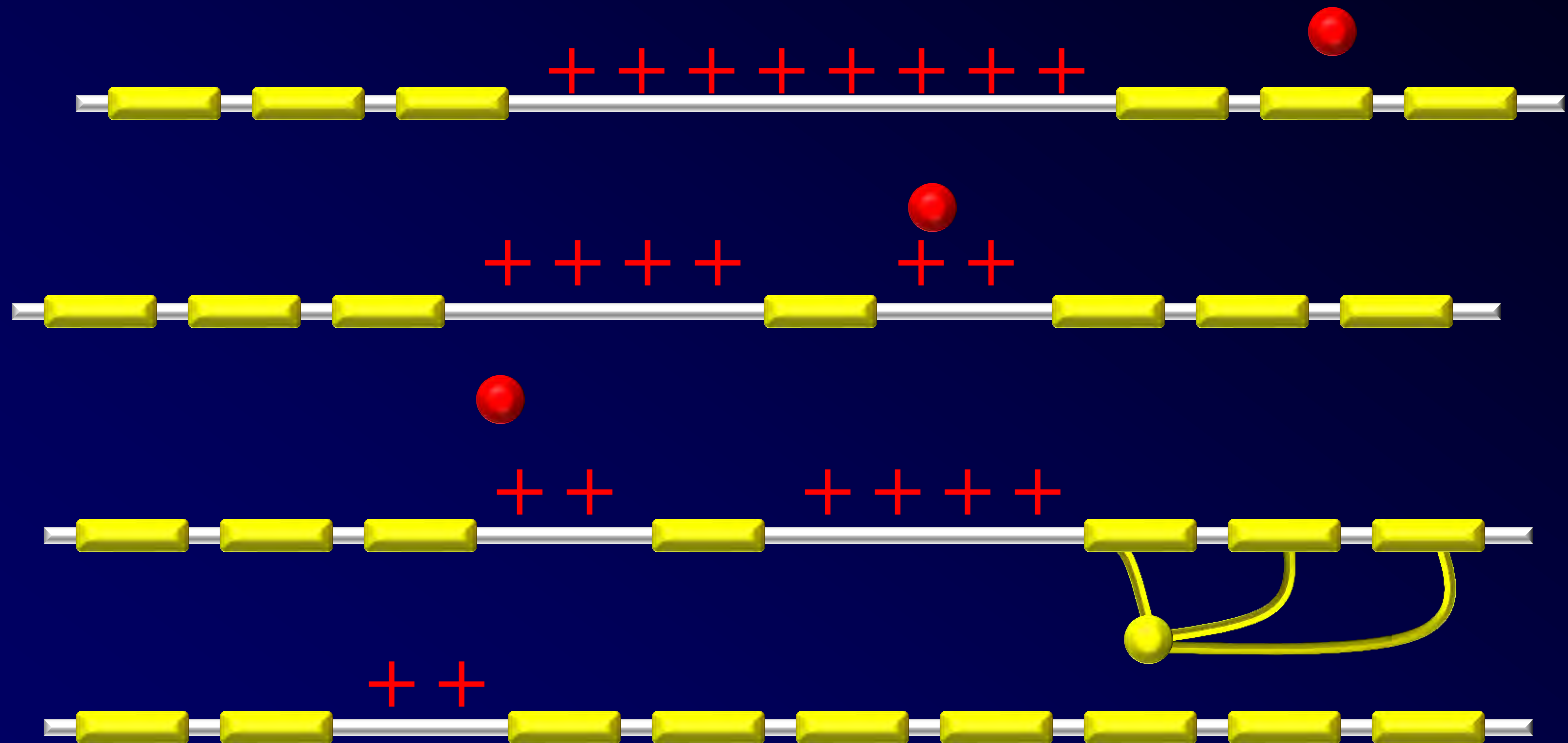




● Oligodendrocyte

● Stem Cell

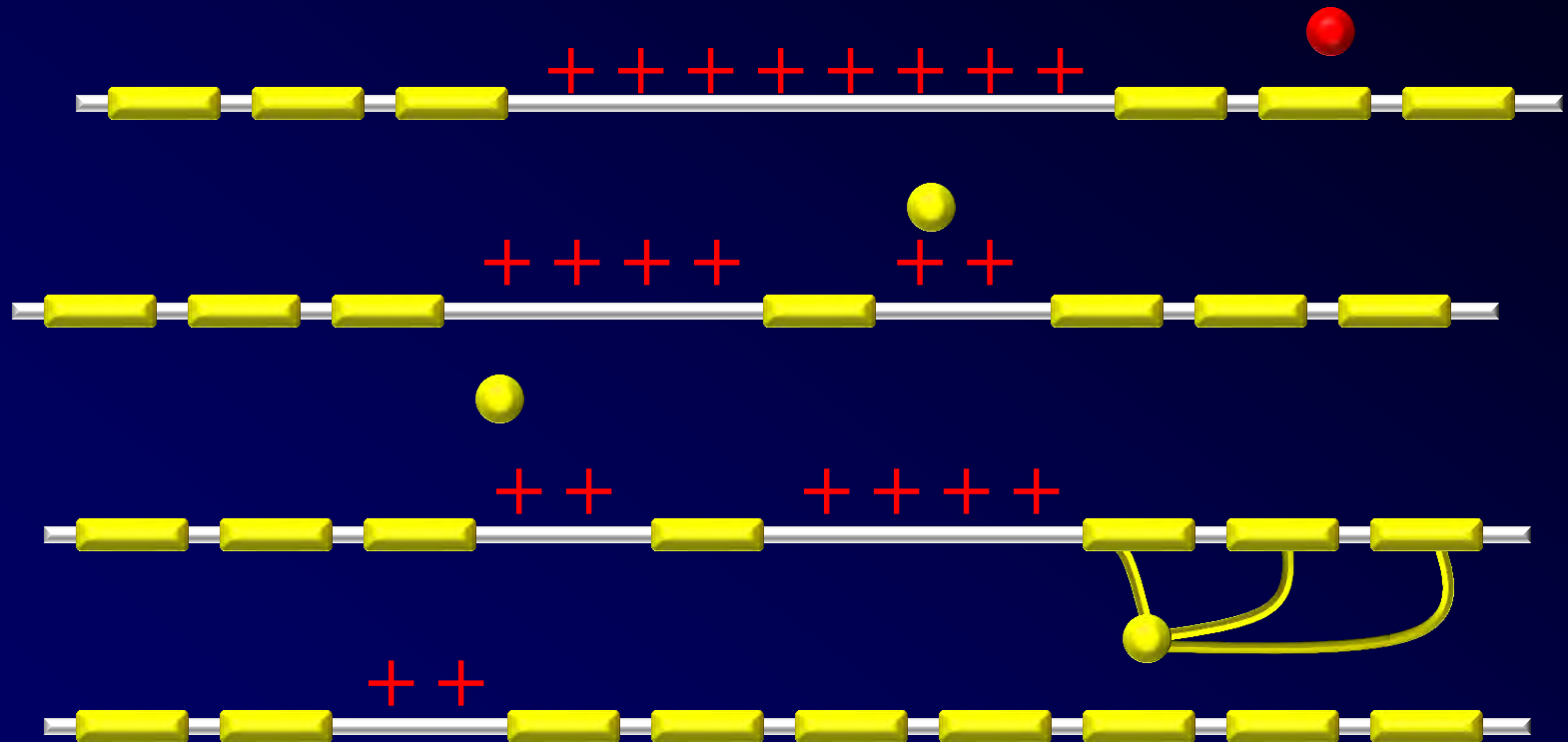
# The “wires” that they are supposed to repair need to be ACTIVE...



● Oligodendrocyte

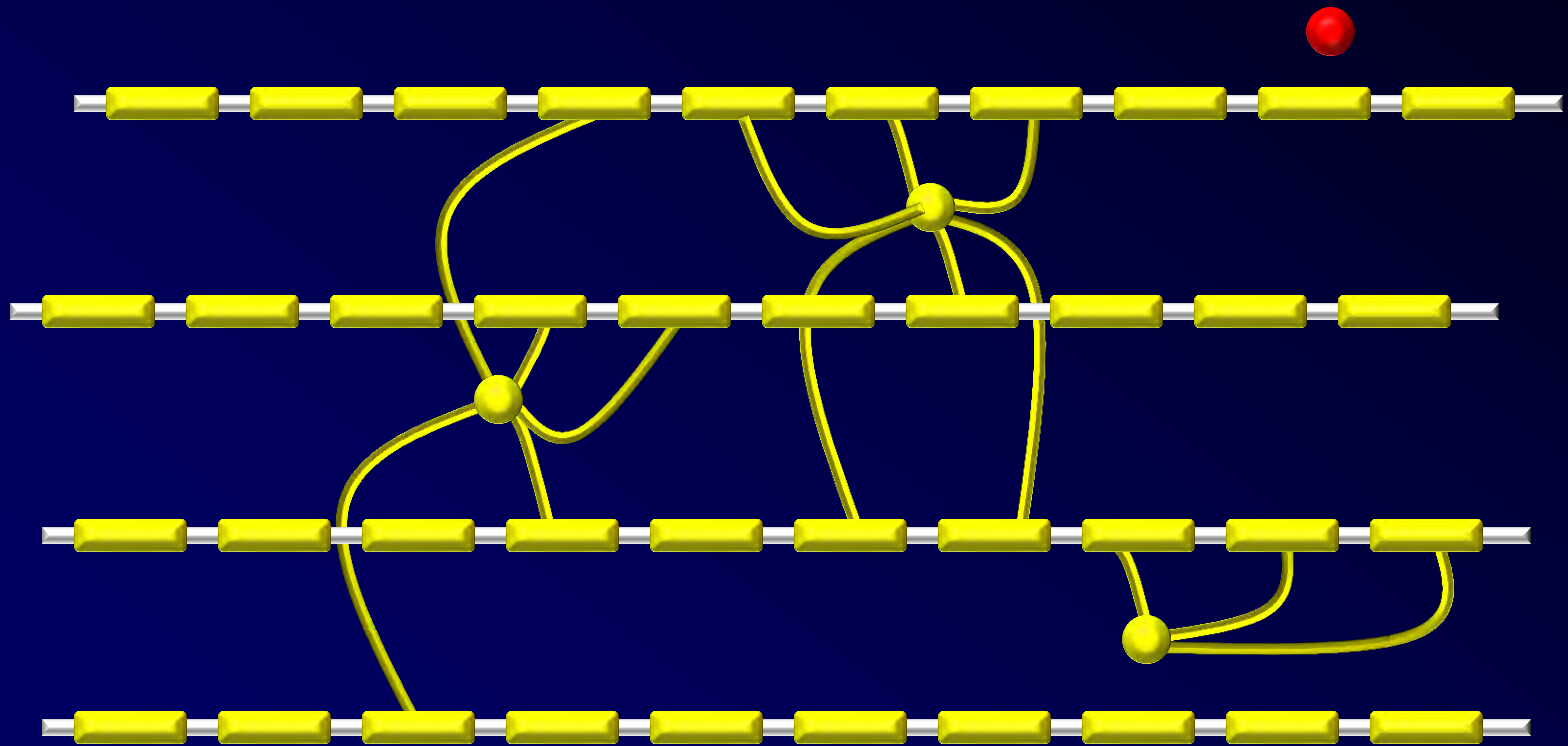
● Stem Cell

...otherwise they cannot see them.



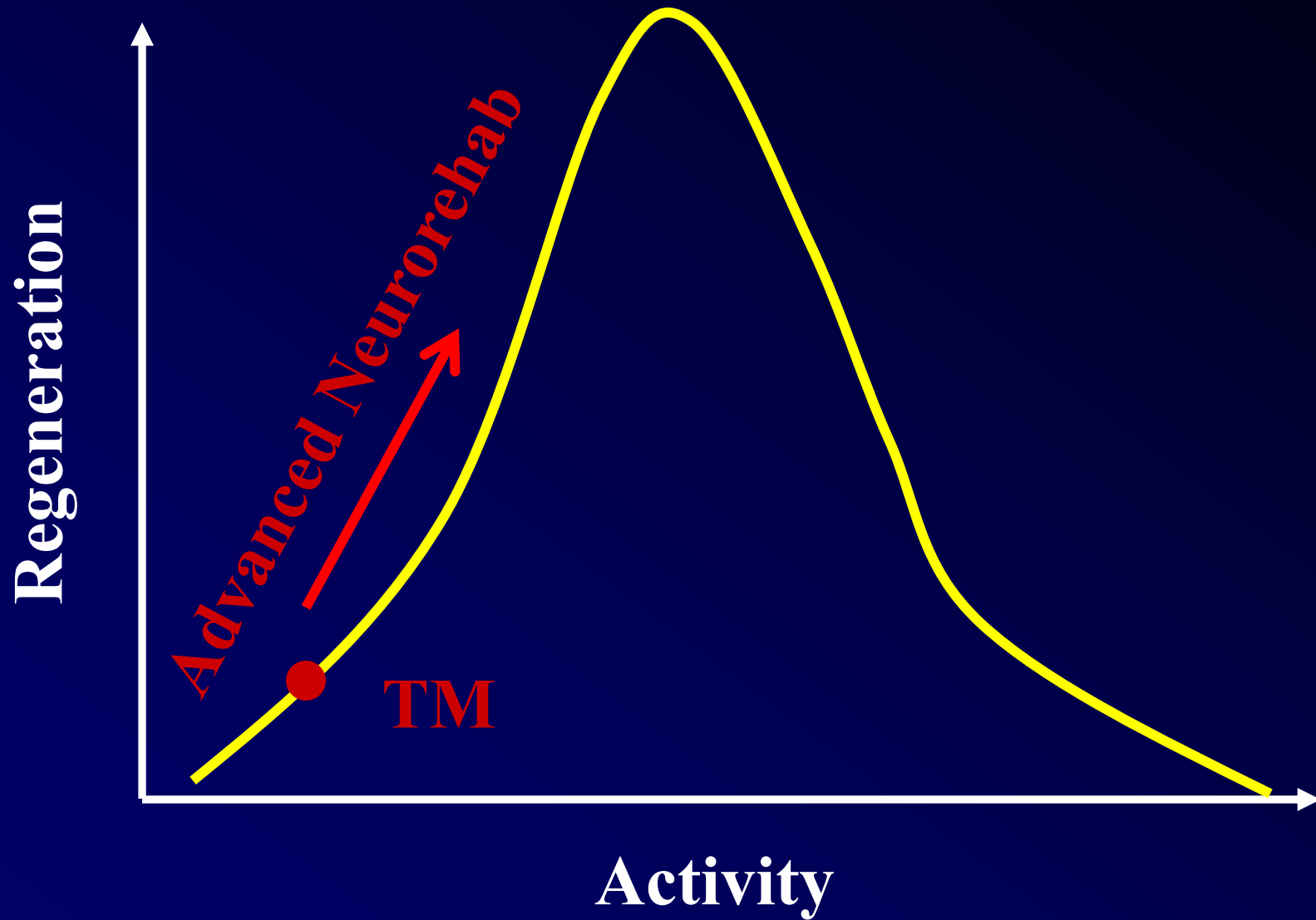
● Oligodendrocyte

● Stem Cell



● Oligodendrocyte

● Stem Cell



**Thank you**