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BENEFICIAL ROLE OF PHYSICAL ACTIVITY IN COUNTERACTING MUSCULOSKELETAL DISORDERS INDUCED BY EARLY MOVEMENT RESTRICTION

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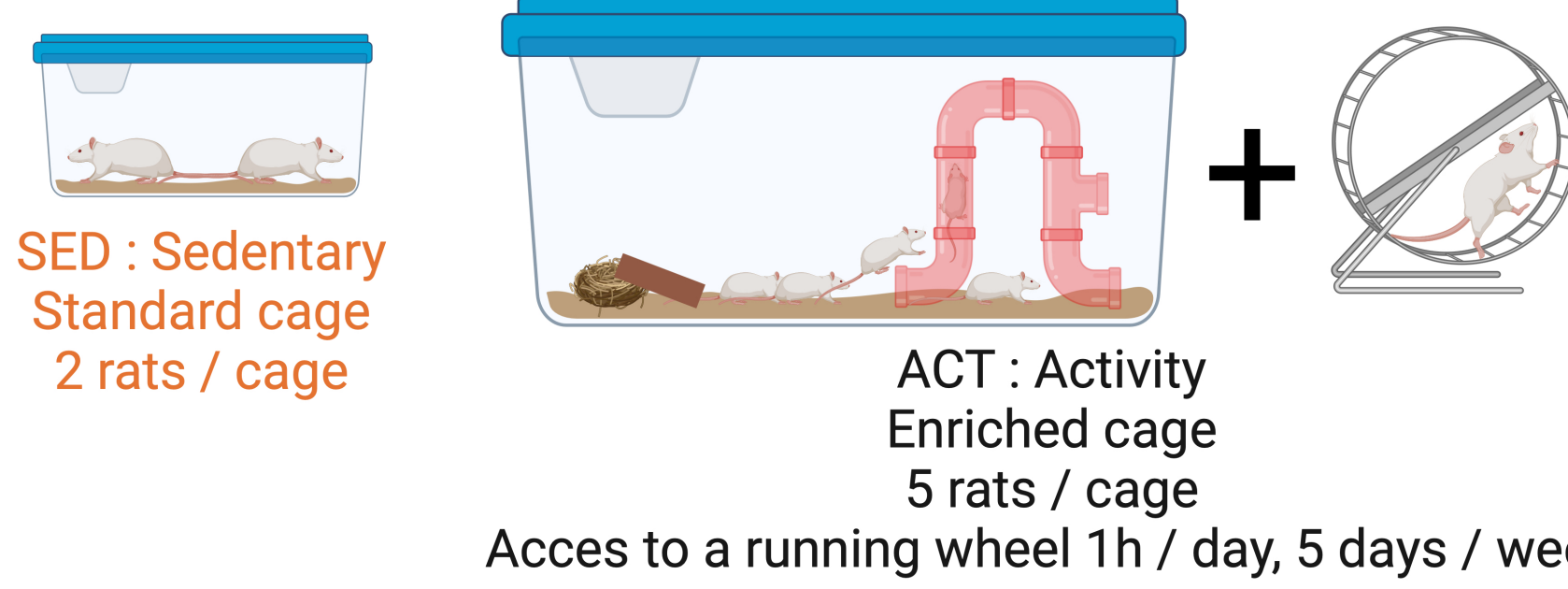
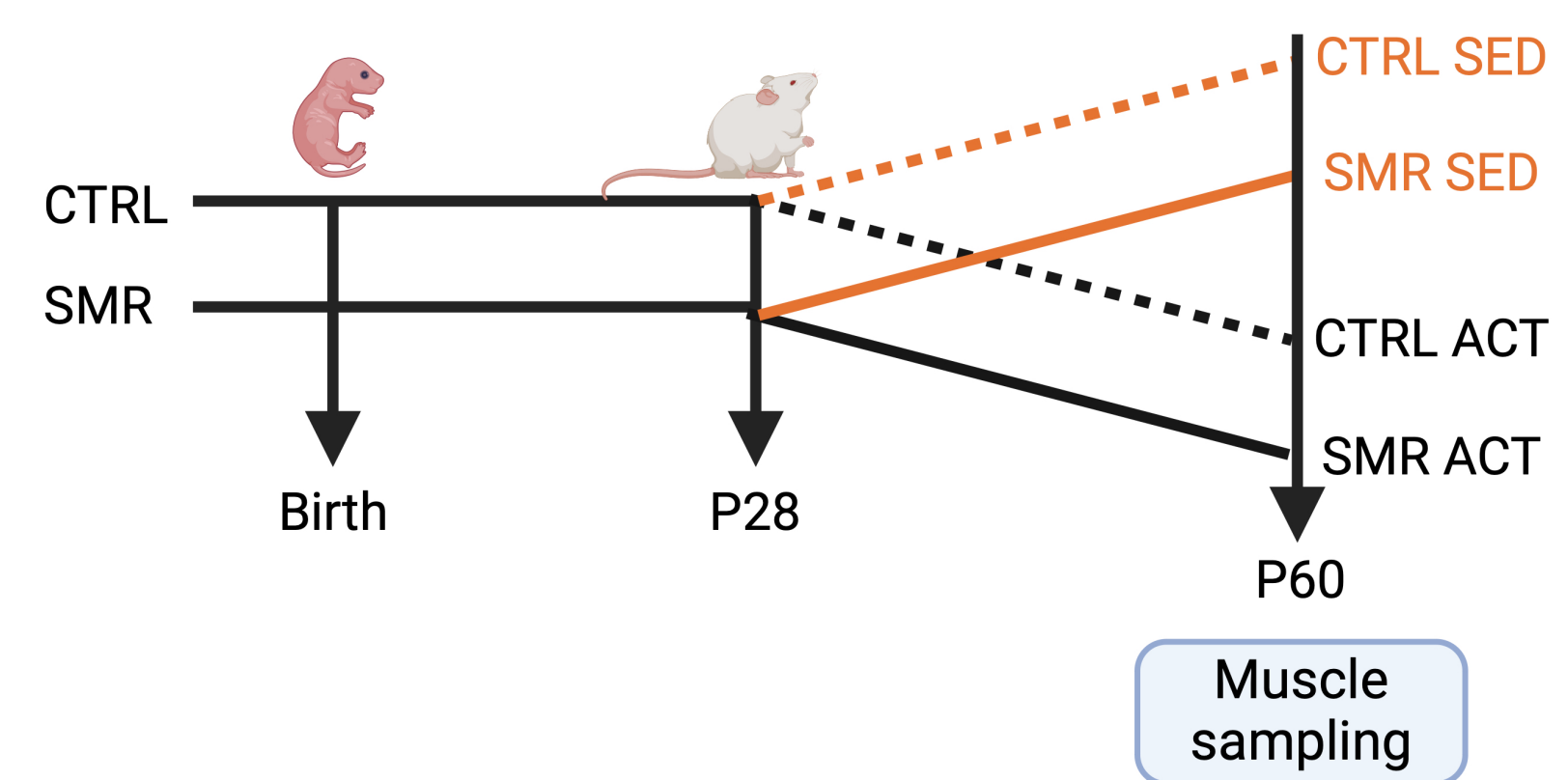
Methods

MODEL

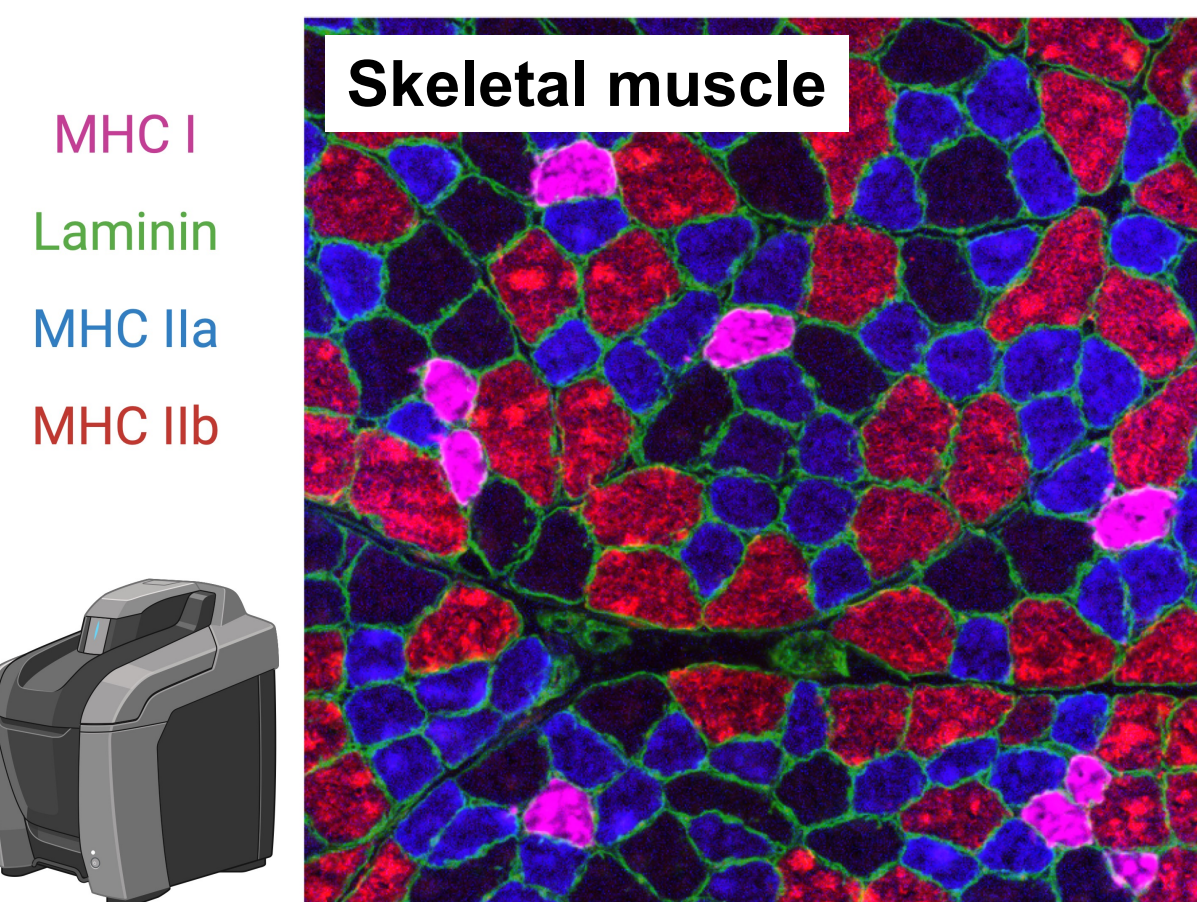


Sensorimotor restriction (SMR)
from birth to postnatal day 28 (P28),
16 hours per day

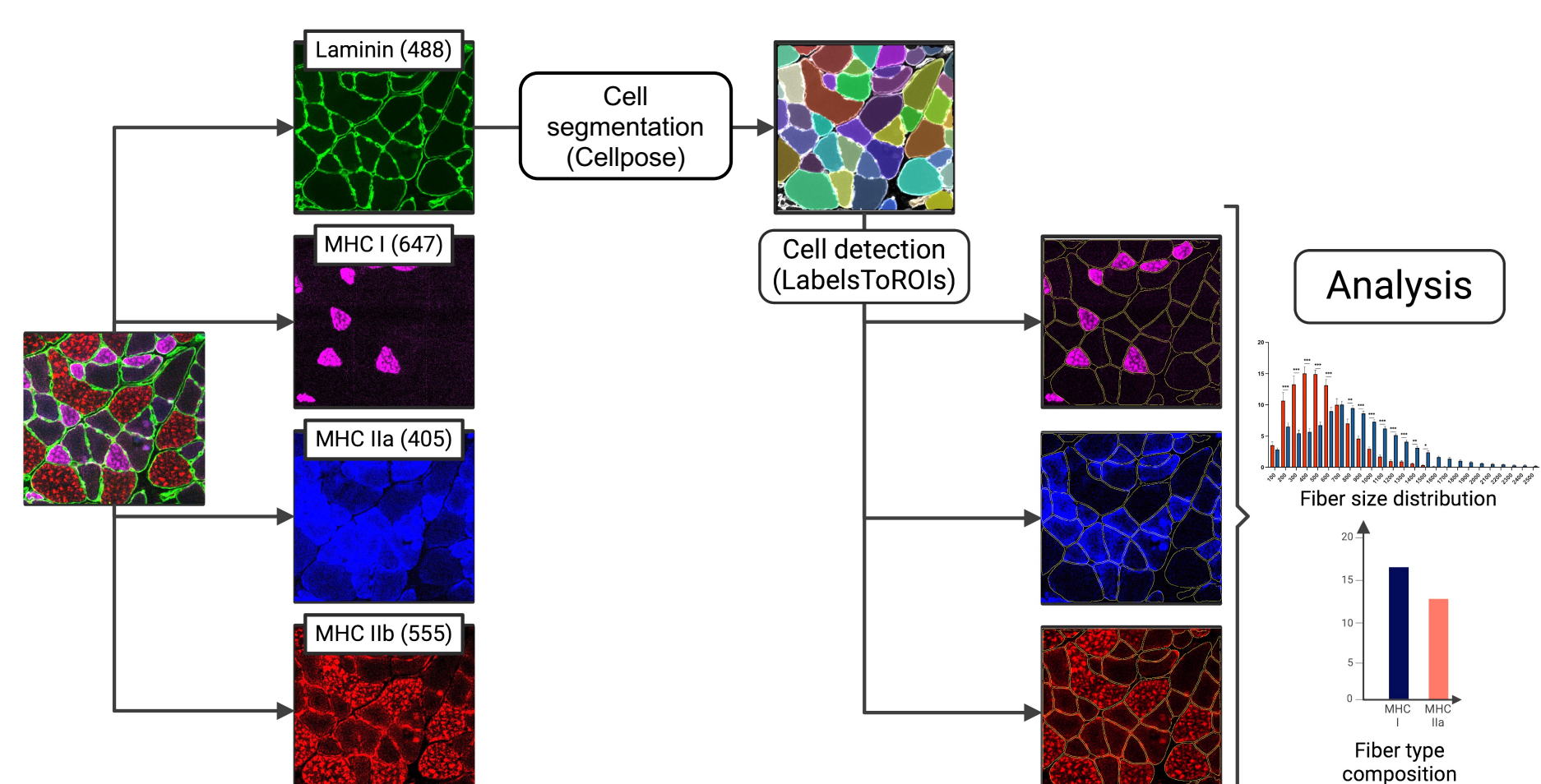
GROUPS



IMMUNOHISTOCHEMISTRY



ANALYSIS

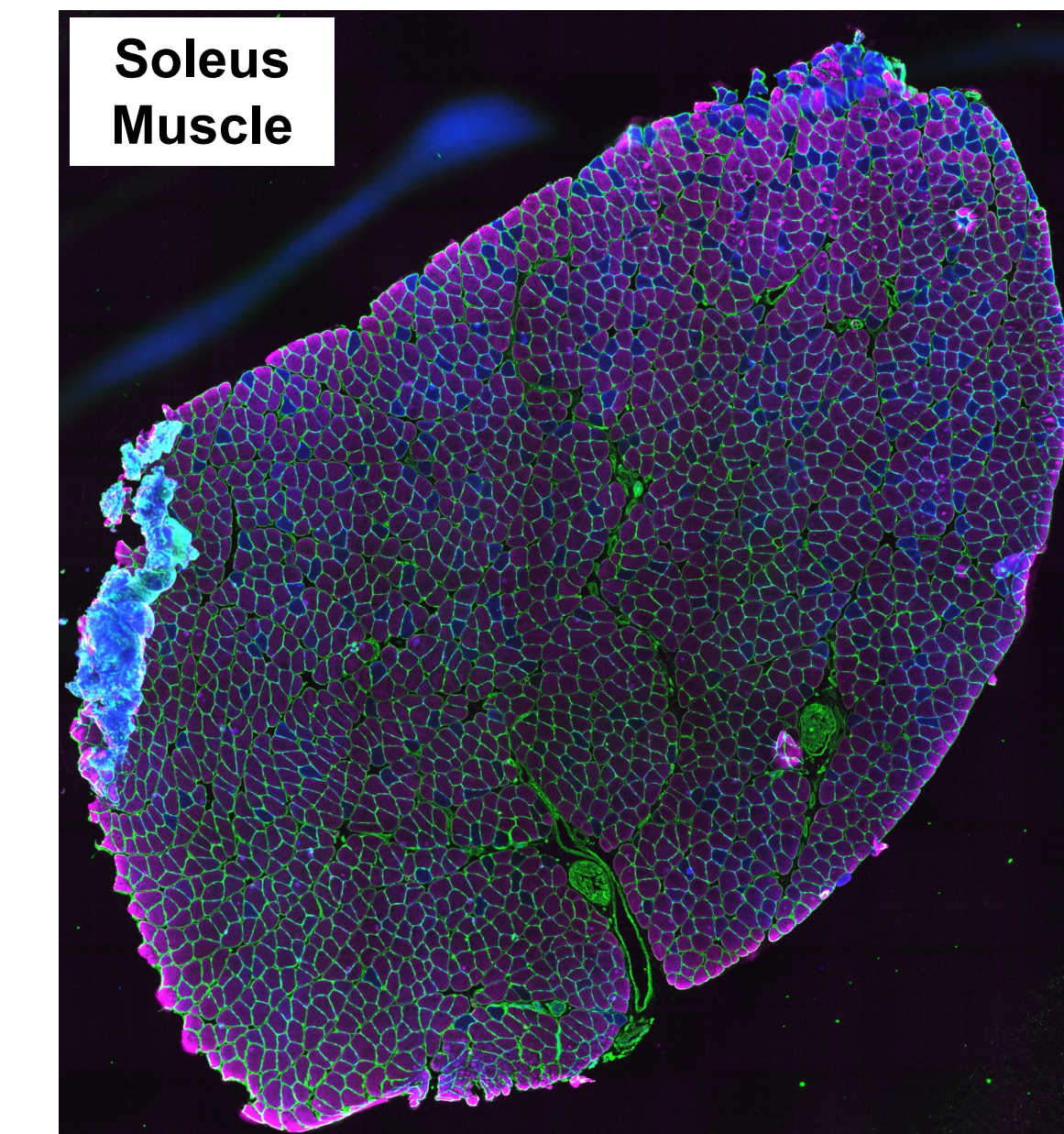
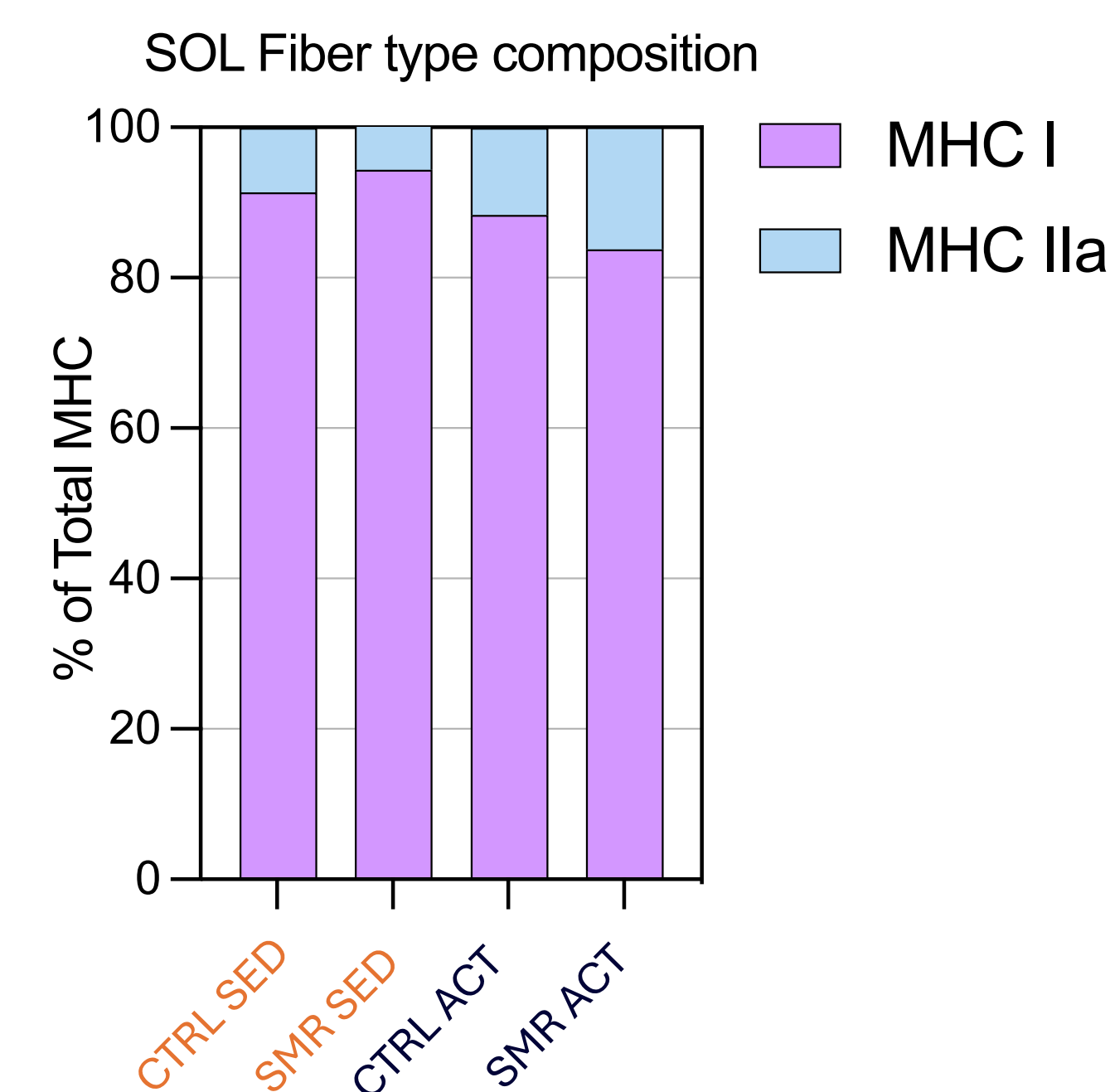
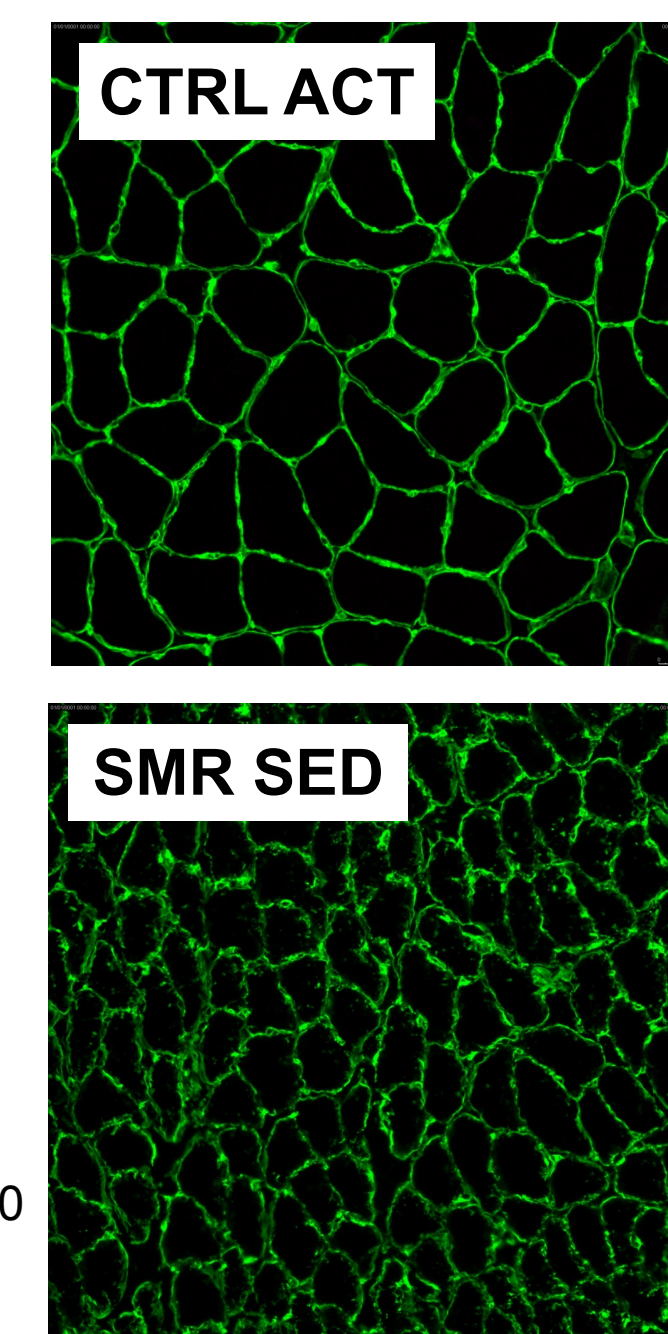
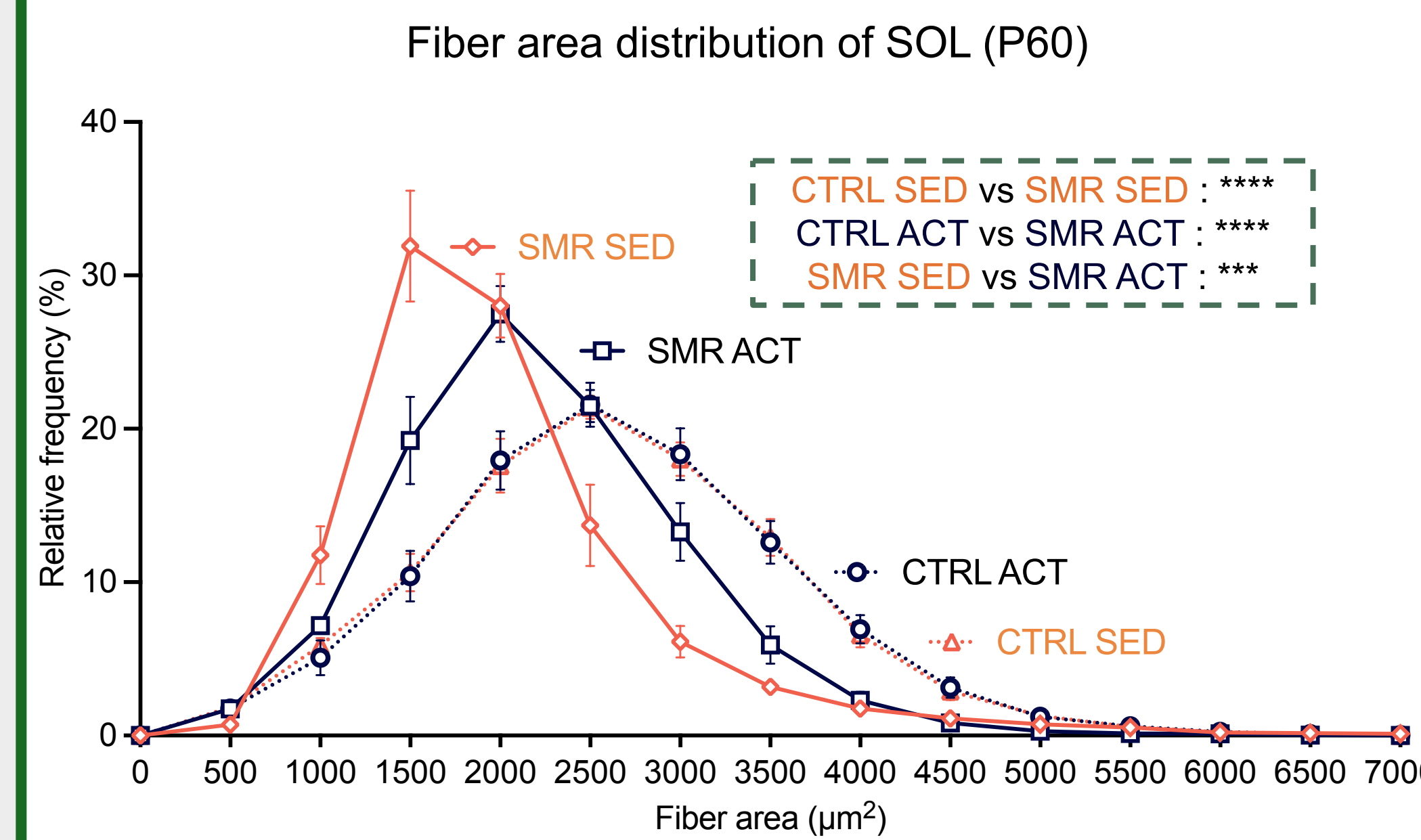


Background

Insufficient physical activity, often associated with a sedentary lifestyle, is a health risk for many children and adolescents, especially those with chronic illnesses, accidents that require prolonged bed rest, or developmental coordination disorder (DCD). This situations, can lead to motor skill difficulties, cognitive problems, and executive function disorders. Physical hypoactivity during childhood can lead to a variety of sensorimotor disorders including behavioral, metabolic, spinal and muscular alterations and can increase the risk of non-communicable diseases in the future. Therefore, understanding use-dependent plasticity in children experiencing early hypoactivity is crucial. Otherwise, physical activity and environmental enrichment are widely recognized for its beneficial effects on general health, including muscles and brain and appears to be necessary for the harmonious maturation of the neuromuscular system.

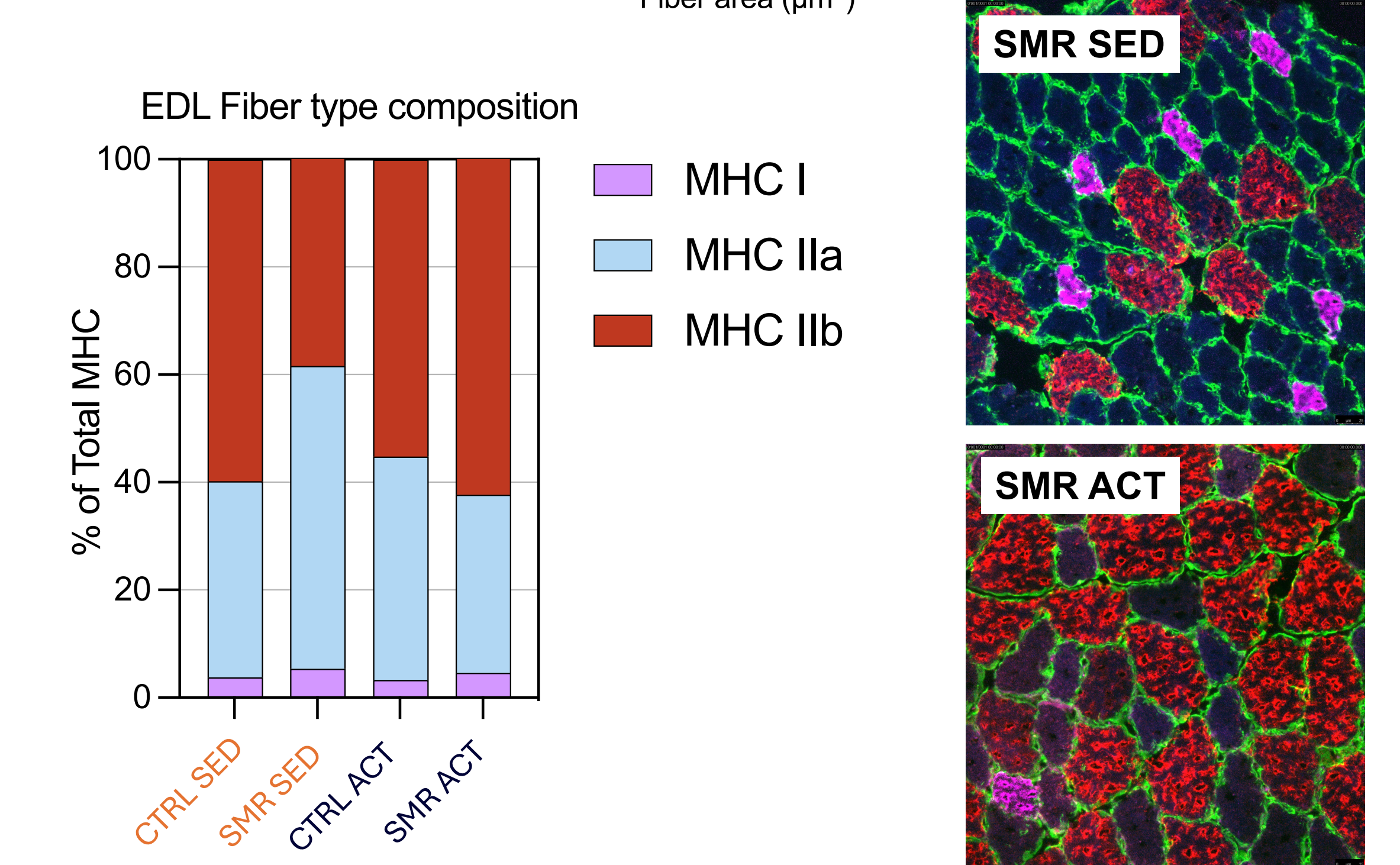
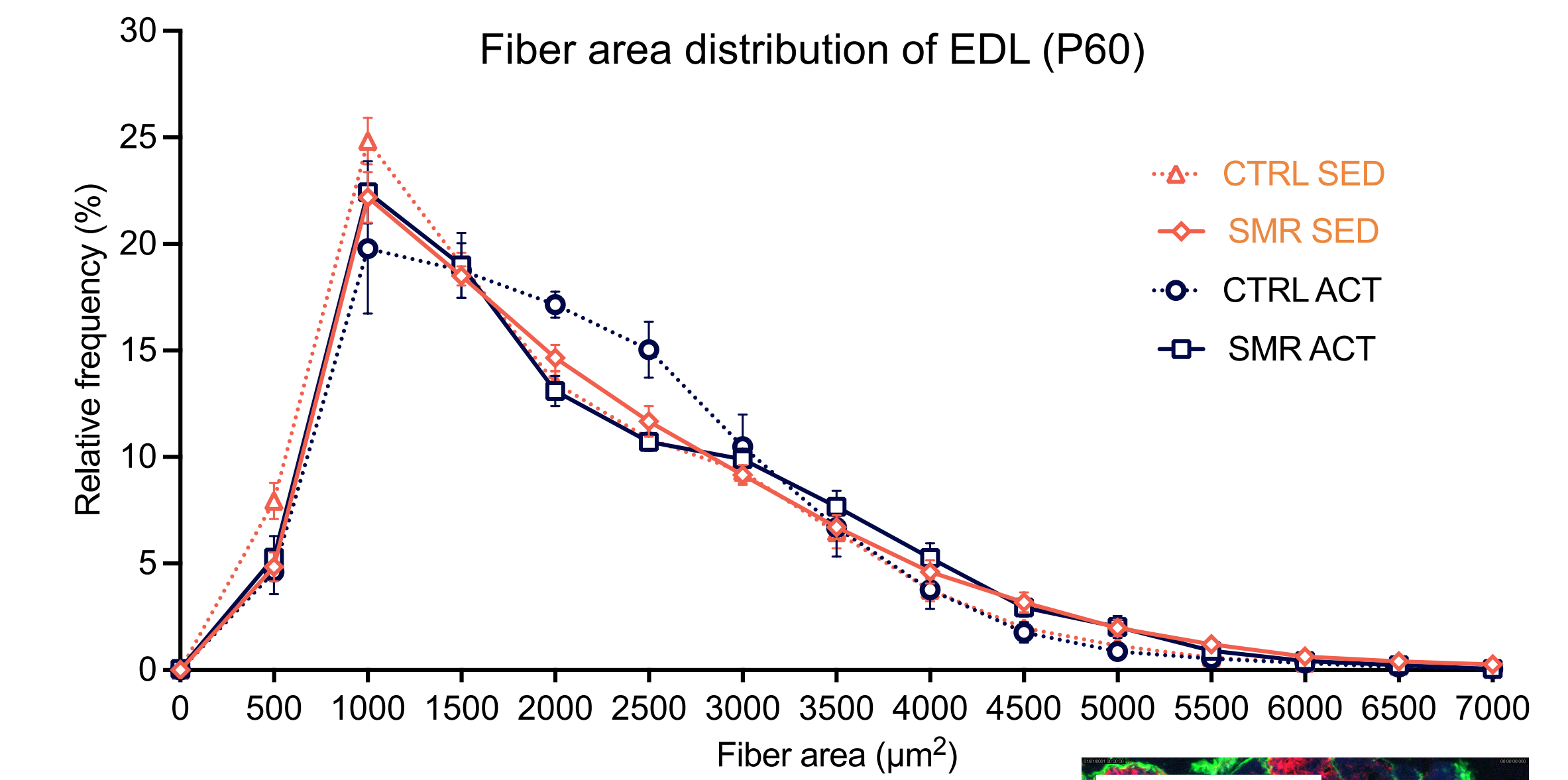
However, despite the importance of the topic, the ability of physical activity to counteract the deleterious effects of early sensorimotor restriction (SMR) remains to be demonstrated.

Soleus



Persistent atrophy is observed in **SMR SED** group, which is **partially prevented** by **activity**.
No change in fiber type composition is observed whatever the group.

EDL



No atrophy is observed whatever the group.
A fast-to-slow transition is observed in the **SMR SED** group which is **prevented** by **activity**.

Conclusion

To sum up, early SMR from birth to P28 has persistent detrimental effects that are partially prevented by voluntary exercise from P28 to P60. Nevertheless, physical activity seems to be an interesting countermeasure to reverse some of the changes induced by early SMR.

However, **this type of physical activity** does not prevent all the alterations induced by the early sensorimotor restriction. It could be interesting to evaluate the effect of a more controlled and standardized exercise protocol.