

Muscle Fiber Part 1 of 3

In my undergraduate career, I was educated on the four main muscle fiber types; Type I, Type IIA, Type IIB and Type IIX. Type I is a slow-oxidative muscle fiber primarily used during endurance exercise, while Type IIX is a fast-glycolic muscle fiber primarily used in all-out bursts of intense exercise (ie; jumping). Type Ila was the happy medium between Type I and Type IIX, offering both oxidative and glycolic metabolism to achieve longer-duration exercise with occasional spurts of intensity. However, in this lecture I learned that there are 7 types of muscle fiber types crossing the spectrum from slow to fast twitch (Type I-Ic-IIc-IIac-IIa-IIax-IIX). These muscle fibers are classified based on myosin heavy chain and myosin light chain, myosin ATPase, the number of calcium released from the SR, ect.

Additionally, this lecture reintroduced the ability to manipulate muscle fiber types based on exercise prescription. Attached is a study noting the changes in muscle fiber types in endurance cyclists after adding 16 weeks of concurrent strength and endurance training to their regime. I was pleased to discovered the results indicated an increase of Type Ila muscle fiber types, which are a faster twitching muscle fiber than their predominate Type I muscle fiber. Although the nerve changes and the assignment changes, their is evidence stating dormant memory of previous muscle fiber assignment.

Reference

Aagaard, P., Andersen, J. L., Bennekou, M., Larsson, B., Olesen, J. L., Crameri, R., Magnusson, S. P., & Kjaer, M. (2011). Effects of resistance training on endurance capacity and muscle fiber composition in young top-level cyclists. *Scandinavian journal of medicine & science in sports*, 21(6), e298–e307. <https://doi.org/10.1111/j.1600-0838.2010.01283.x>