

Lecture 6

Wednesday, July 14, 2021

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Orderly Recruitment: The History & Science of Size Principle

- Muscle fiber type:
 - o Alpha motor neurons have thickly myelinated axons --> speedy conduction velocities (35 - 65 m/s)
 - o Cats are faster (duh) about 50 - 120 m/s
- Type I (I; Ic)
 - o Slow, aerobically efficient
 - o I - slow oxidative (dark/red meat)
- Type II (Iic; Iiac; Ila; Ila_x; IIX)
 - o Fast, extremely strong/powerful
 - o Ila - fast oxidative
 - o IIX - fast glycolytic (white meat)
- A bunch of muscle fibers types, not just type I and II
- MHC and MLC (myosin heavy chain and "light")
- Quality of muscle matters as much as quantity of muscle
- Skeletal muscle fibers vary morphologically and physiologically
 - o Morphologically - structure and form
- Fibers on a single motor unit *tend* to be the same
 - o [almost *entirely* true] fibers that are activated by a single motor nerve all belong to the same fiber type (have the same MHC fiber type)
- Fiber type switching?
 - o It does happen (exercise "type" adaptation)
 - o More exercise, less inhibition
 - More exercise, less Golgi tendon inhibition/activation
- Axonal sprouting and changes in fiber types after running-induced muscle damage -- *fiber type switching as an exercise adaptation*
- Type I muscle fibers have a really low growth ceiling
 - o Can enhance performance and integrity of fibers