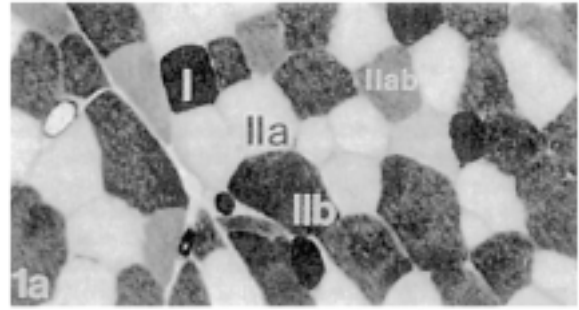


Table 10.1 Properties of twitch (phasic) fibers in mammalian skeletal muscles

Property	Slow oxidative (type I)	Fast oxidative (type IIa)	Fast glycolytic (type IIb)
Fiber diameter	↓	↔	↑
Force per cross-sectional area	↓	↔	↑
Rate of contraction (V_{max})	↓	↑	↑
Myosin ATPase activity	↓	↑	↑
Resistance to fatigue	↑	↔	↓
Number of mitochondria	↑	↑	↓
Capacity for oxidative phosphorylation	↑	↑	↓
Enzymes for anaerobic glycolysis	↓	↔	↑

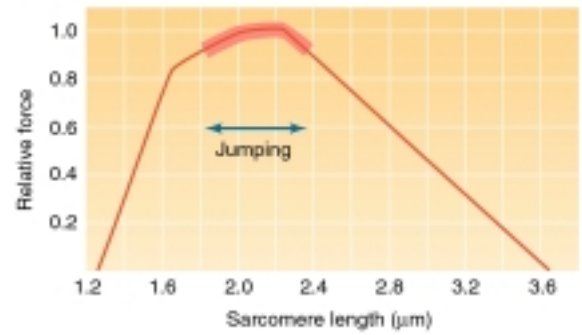
Source: Adapted from Sherwood, 2001. Key: ↓ Low ↔ Intermediate ↑ High



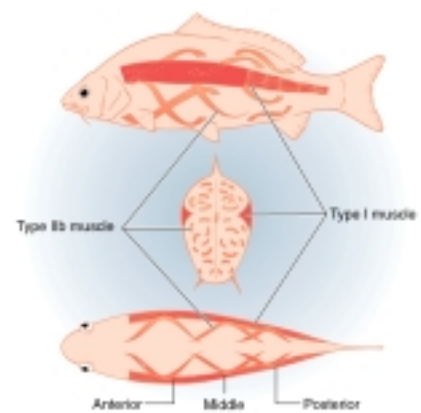
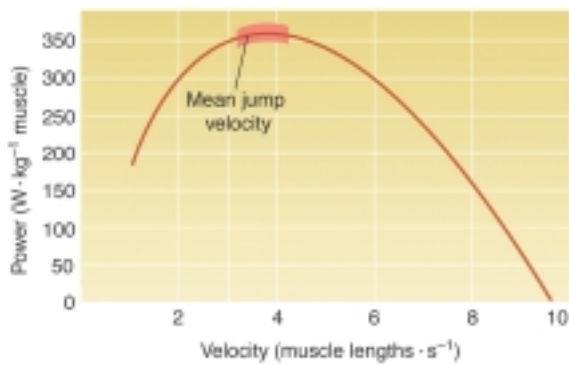
(a)

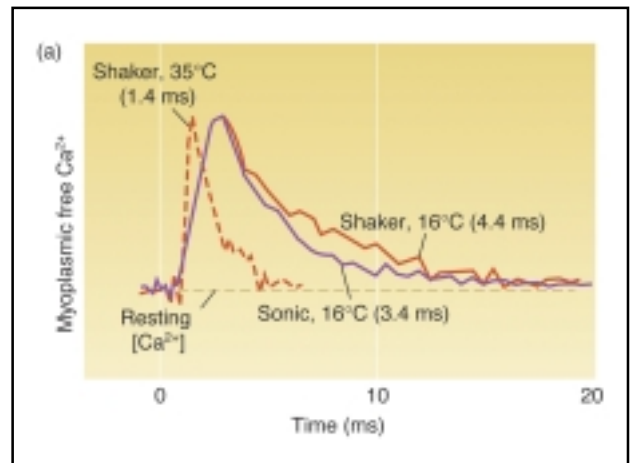
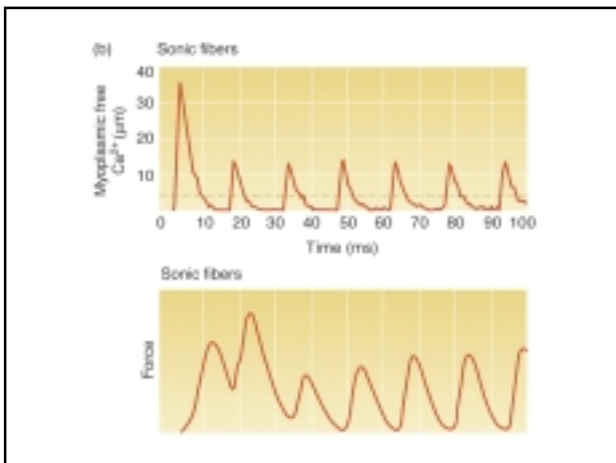
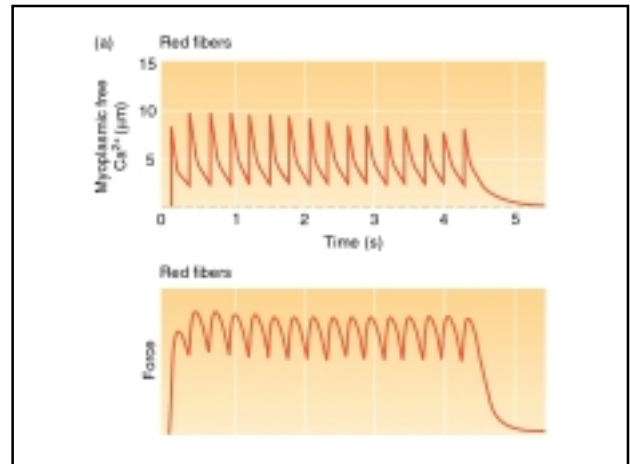
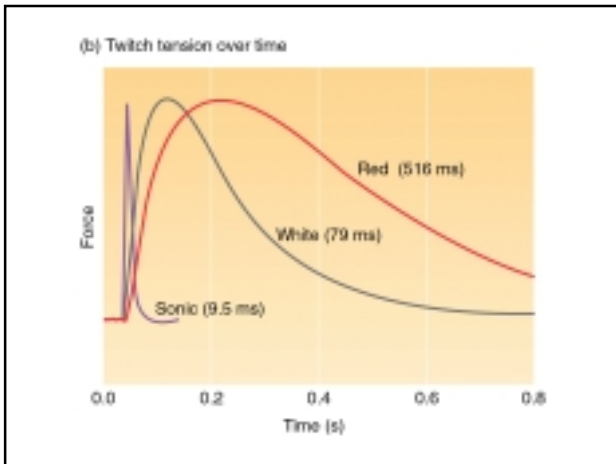
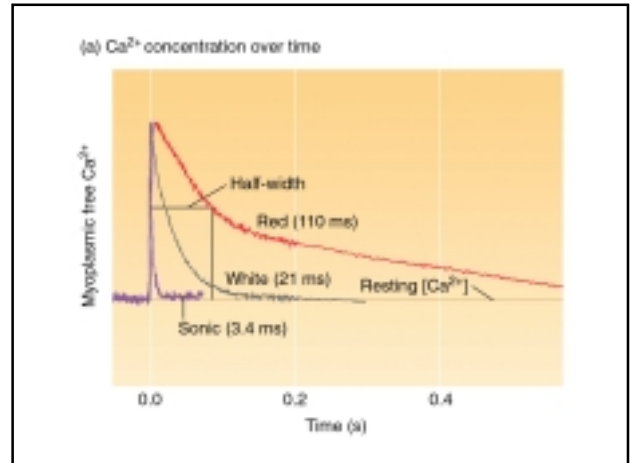
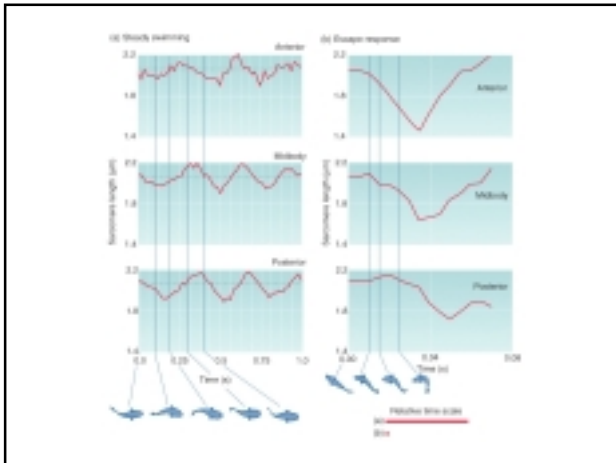


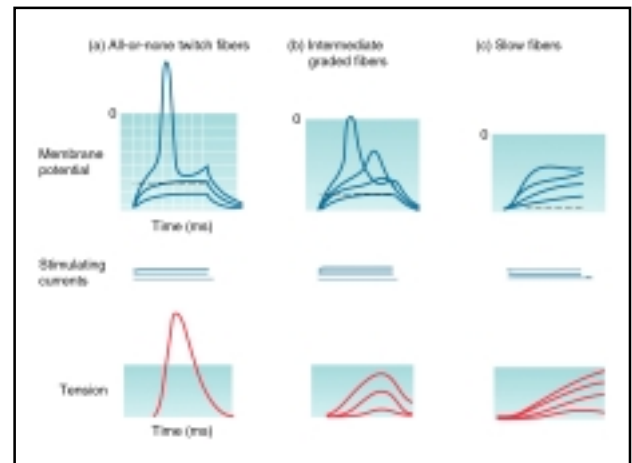
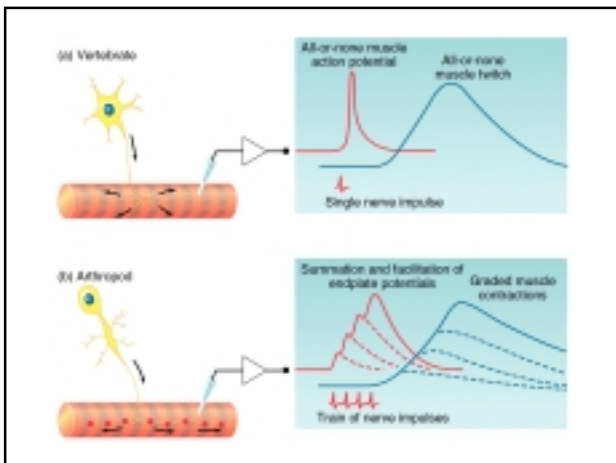
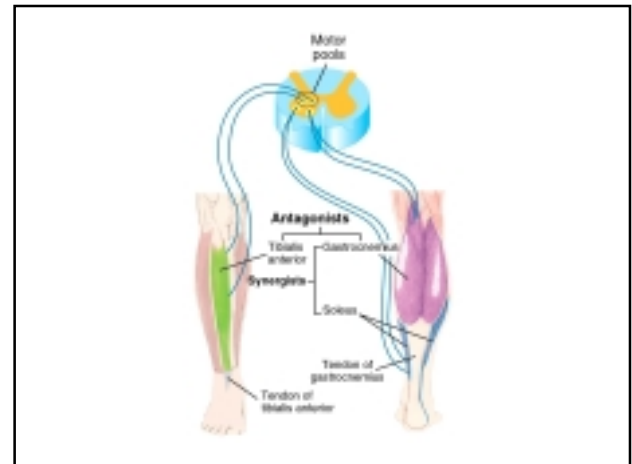
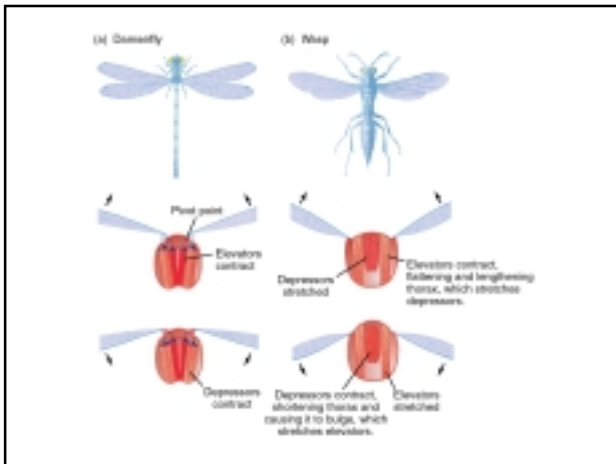
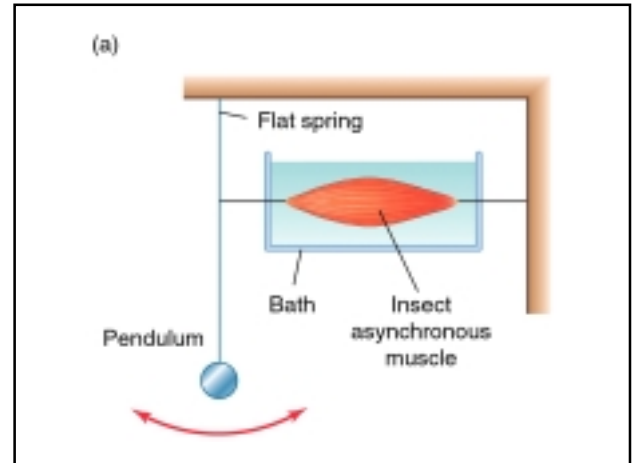
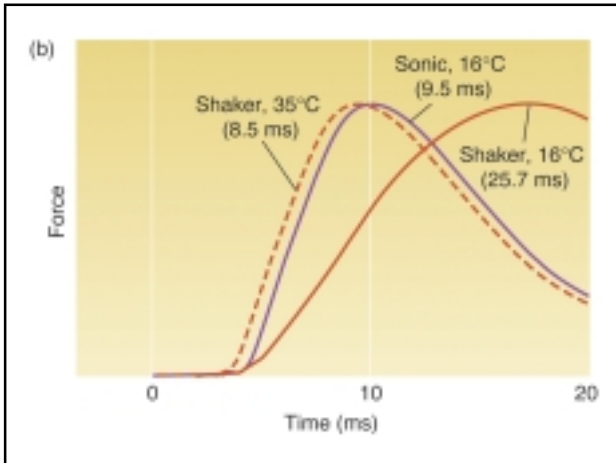
(a)



(b)







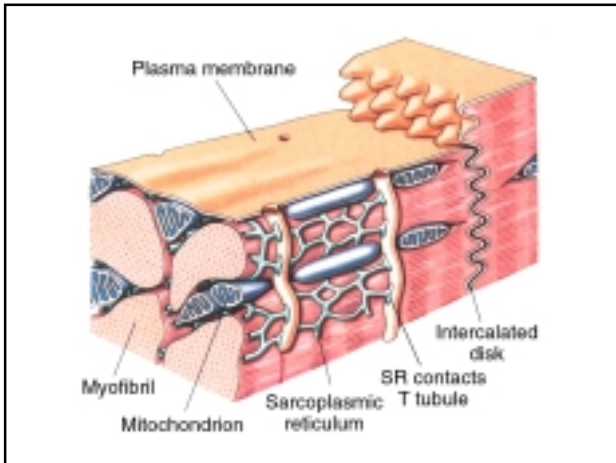
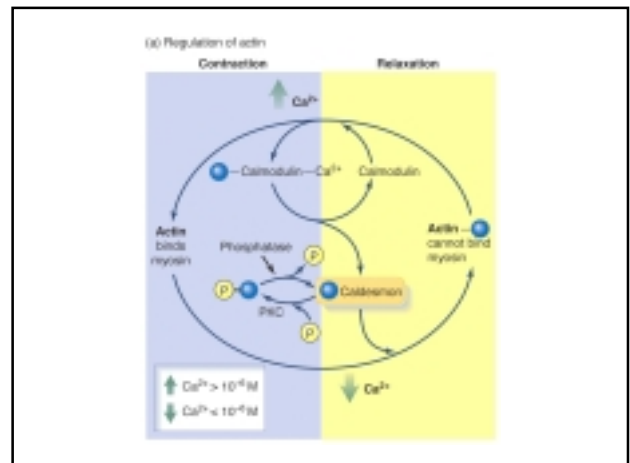
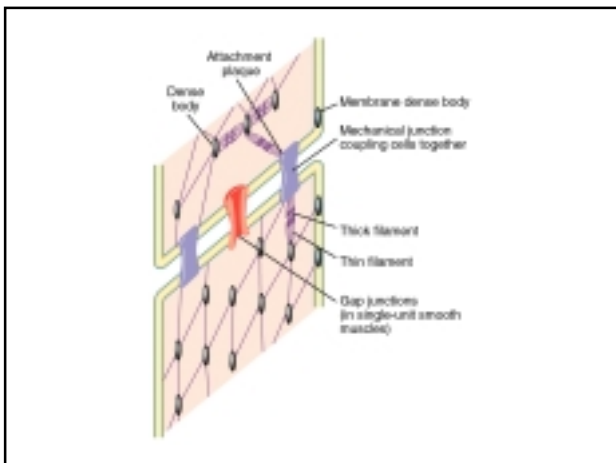
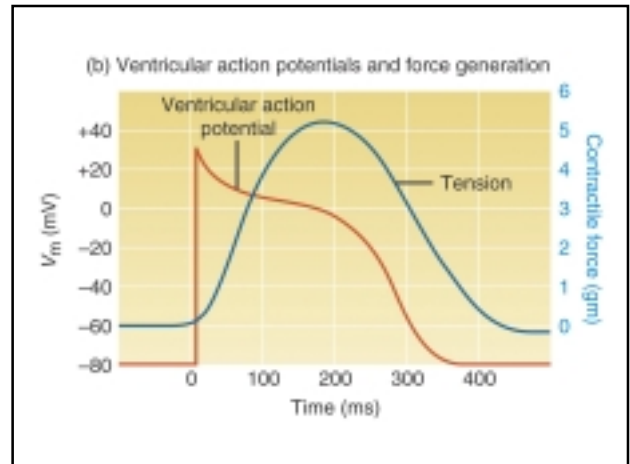
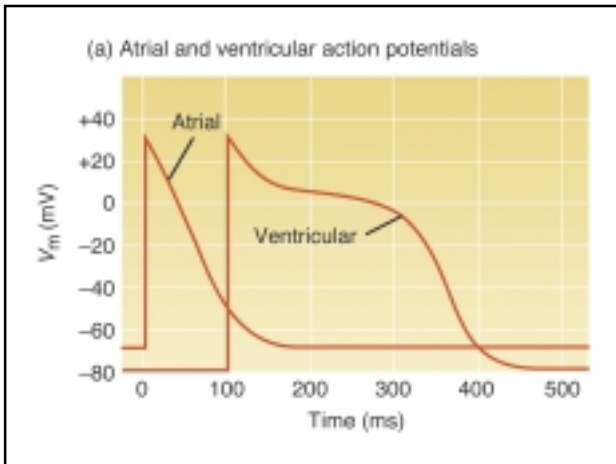


Table 10.2 Characteristics of the major types of muscle fibers in vertebrates

Property/Component	Skeletal muscle	Heart muscle	Smooth (unstriated) muscle	Single-unit
Visible banding pattern	Yes	Yes	No	No
Myofibril filaments and other filaments	Yes	Yes	No	No
Tropomyosin and actin	Yes	Yes	No	No
Myosin molecules	Yes	Yes	No	No
Sarcomere structure	Well developed	Well developed	Very little	Very little
Mechanism of contraction	Sliding of thick and thin filaments past each other	Sliding of thick and thin filaments past each other	Sliding of thick and thin filaments past each other	Sliding of thick and thin filaments past each other
Excitability	Excitable	Excitable	Excitable	Excitable
Initiation of contraction*	Neurogenic	Myogenic	Neurogenic	Myogenic
Source of Ca^{2+} for activation	EC	ECF and SR	ECF and SR	ECF and SR
Gap junctions between fibers	No	Yes	No	Yes
Speed of contraction	Fast or slow depending on fiber type	Slow	Very slow	Very slow
Closest relationship to sarcomere length and mode	Yes	No	No	No

*Neurogenic excitation: cells also excitable except for the nervous system. Myogenic excitation: produces depolarizing membrane potential, independent of any nervous system. EC: excitation-contraction coupling. ECF: extracellular fluid. SR: sarcoplasmic reticulum. Data adapted from Huxford, 1998.



(b) Regulation of myosin light chains

