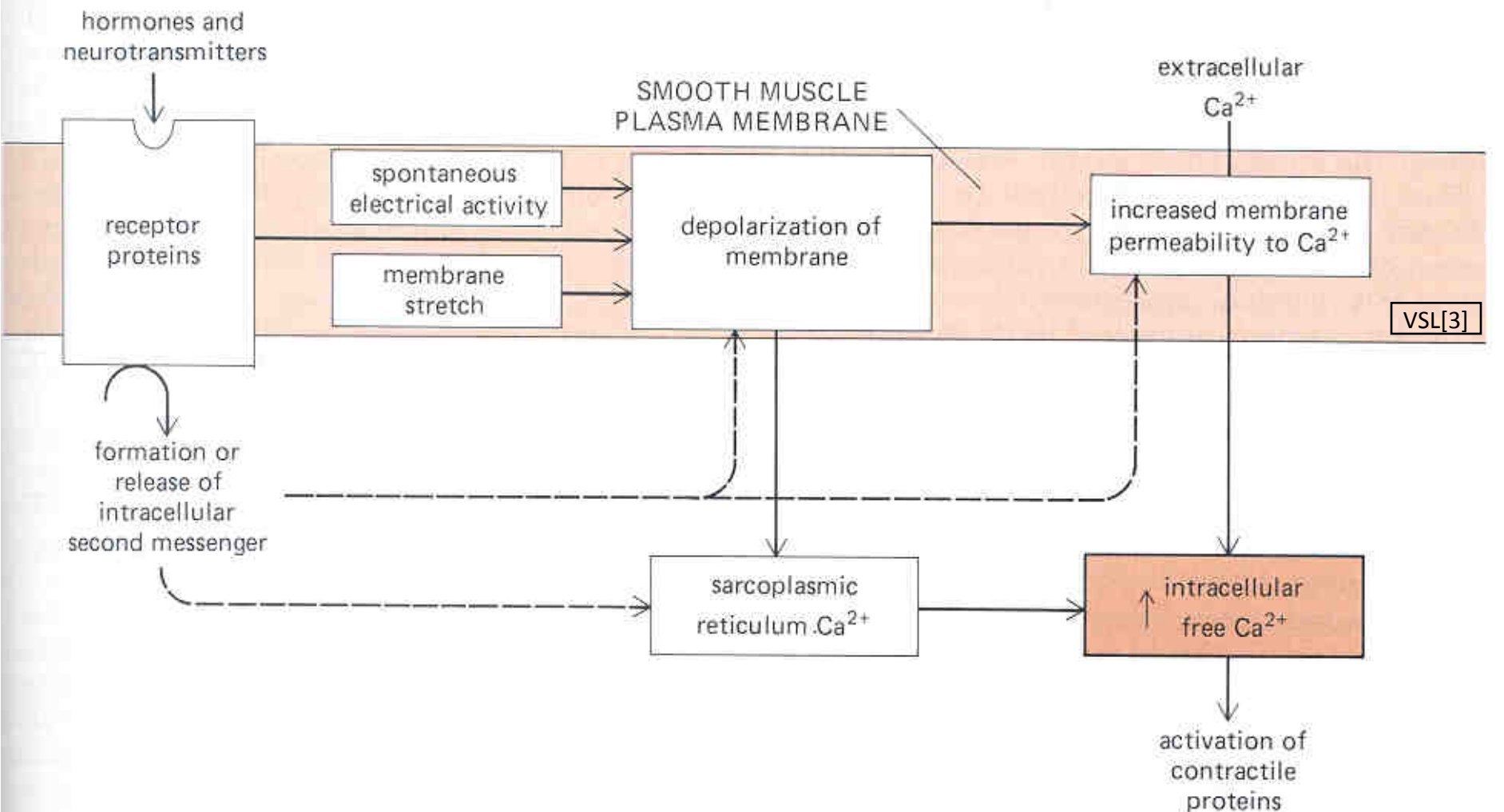


Figure 10-35. Electrical and chemical pathways leading to an increase in intracellular free calcium ion concentration in smooth muscle. The dashed lines denote second-messenger pathways. Not shown are the pathways by which locally induced changes in extracellular composition influence the muscle.



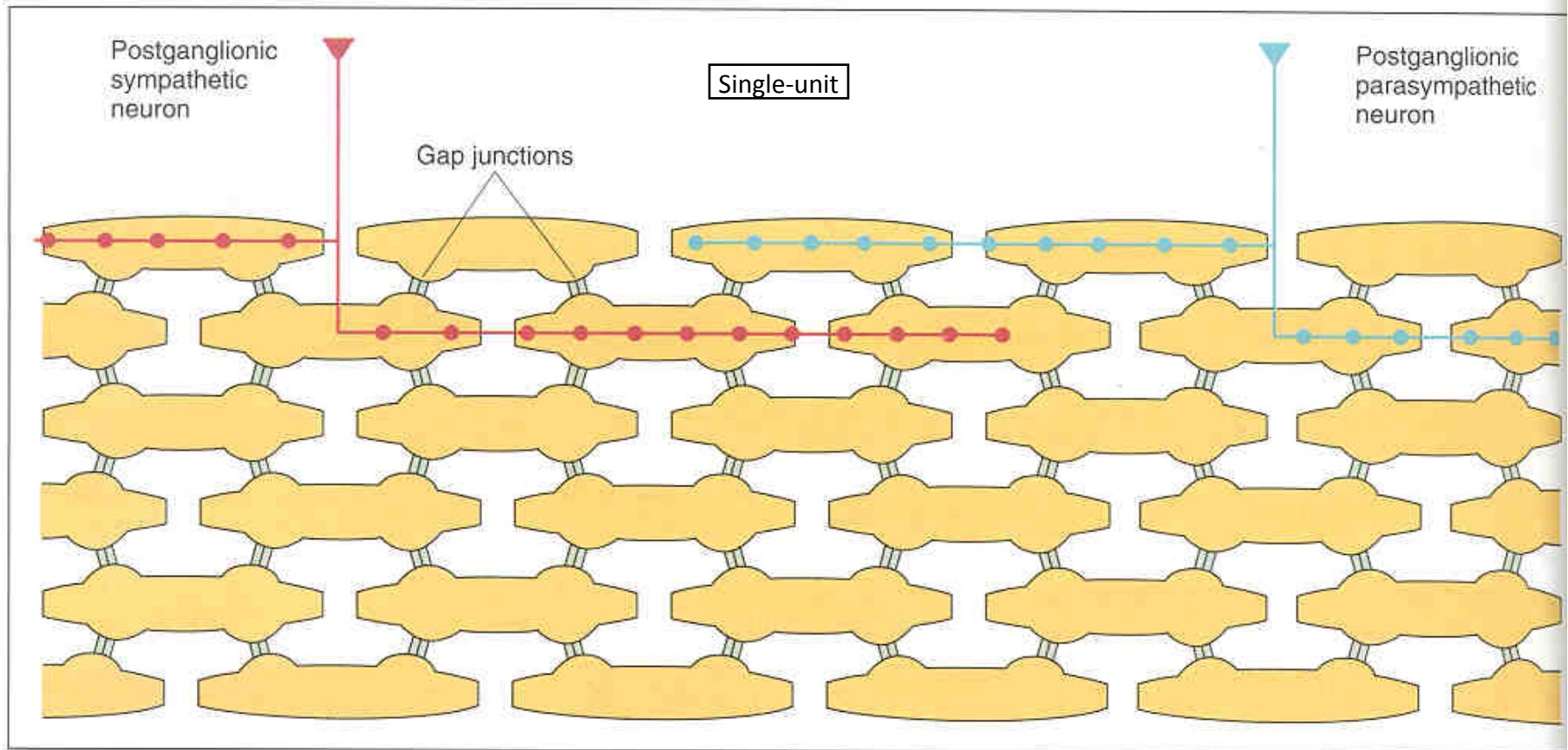
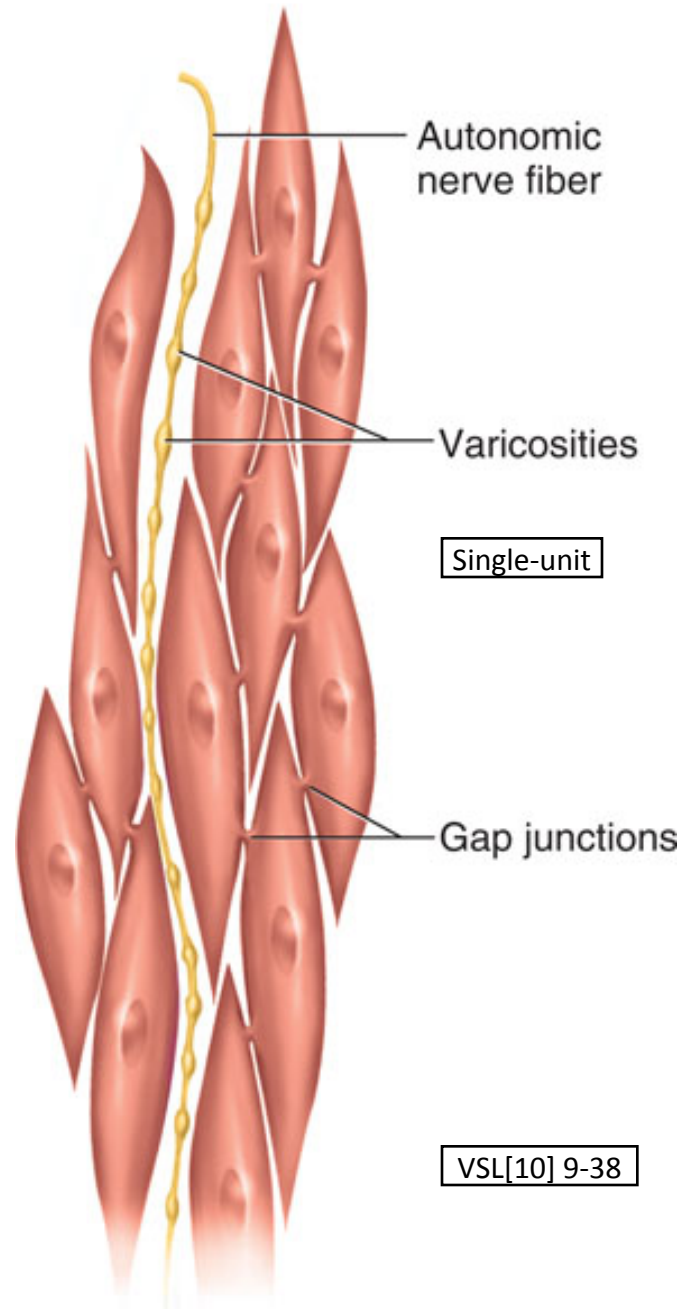


FIGURE 11-42

Innervation of a single-unit smooth muscle is often restricted to only a few fibers in the muscle. Electrical activity is conducted from fiber to fiber throughout the muscle by way of the gap junctions between the fibers.

VSL[6]



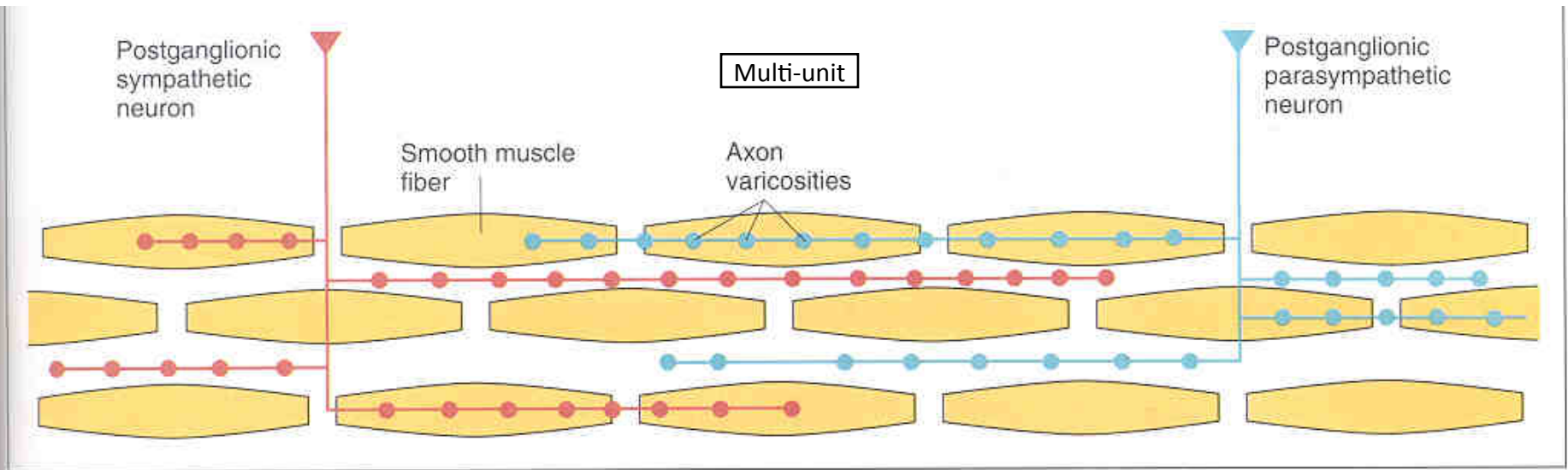
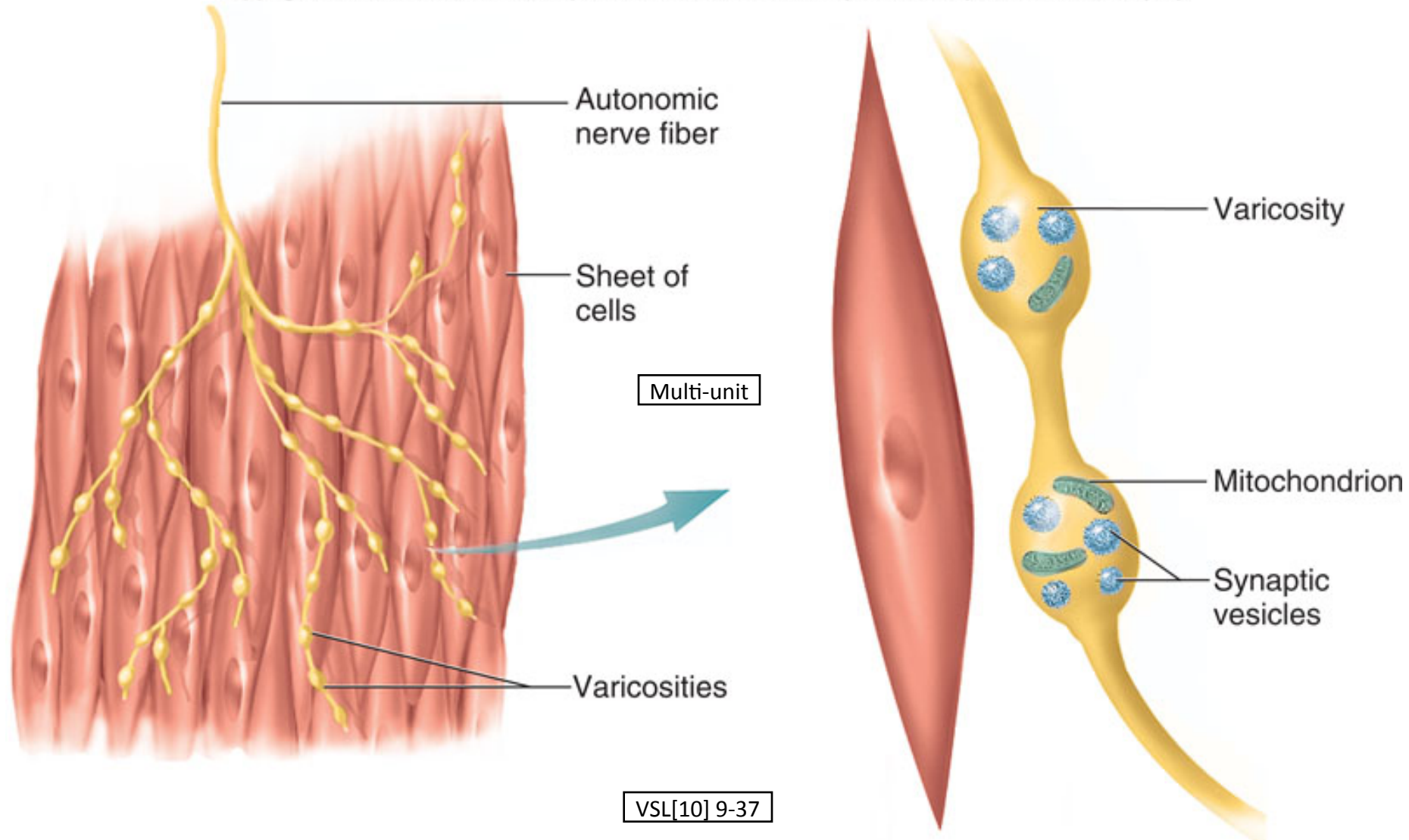
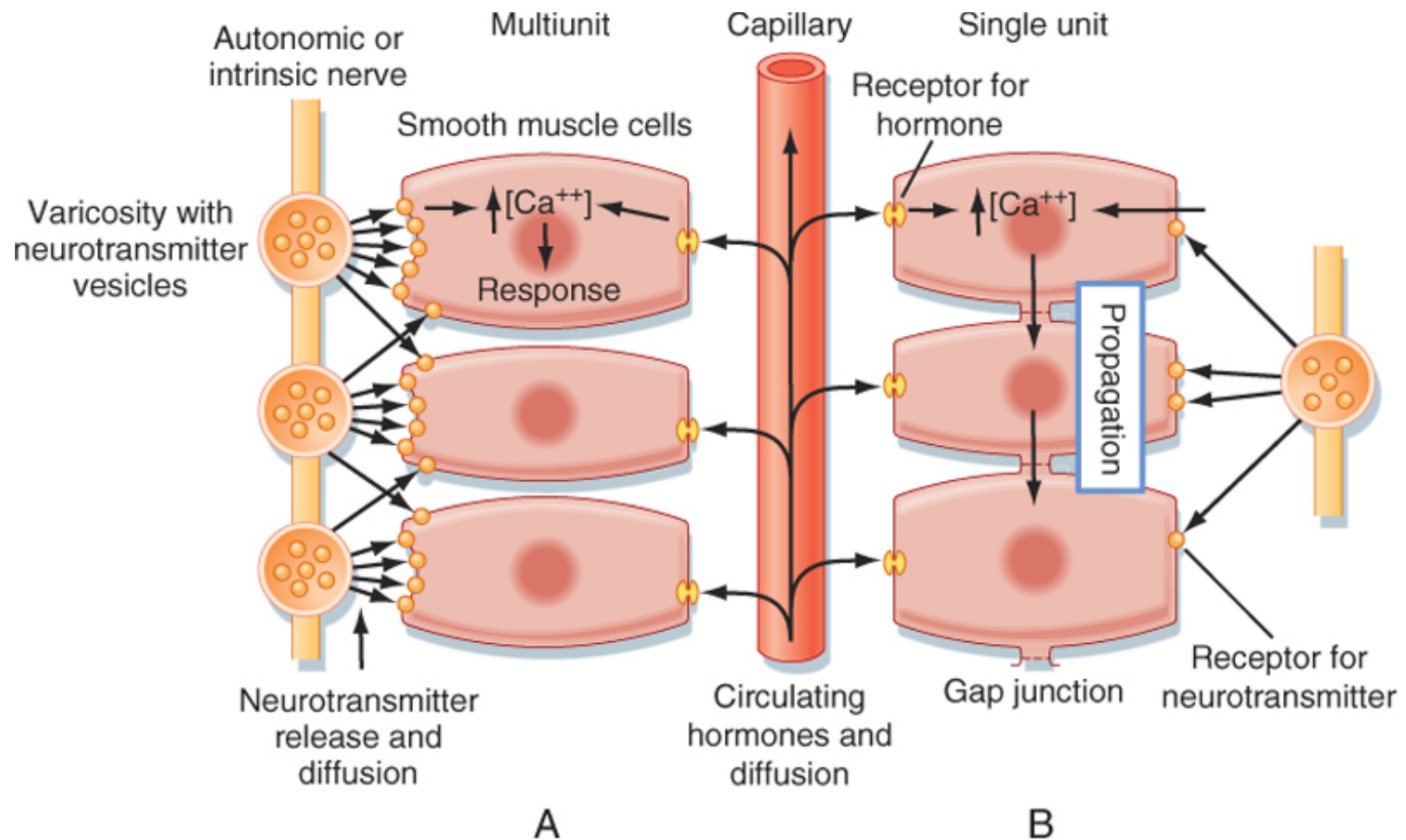


FIGURE 11-41

Innervation of smooth muscle by postganglionic autonomic neurons. Neurotransmitter is released from the varicosities along the branched axons and diffuses to receptors on muscle fiber plasma membranes.

VSL[6]





Koeppen & Stanton: Berne and Levy Physiology, 6th Edition.
 Copyright © 2008 by Mosby, an imprint of Elsevier, Inc. All rights reserved

Figure 14-7 Control systems of smooth muscle. Contraction (or inhibition of contraction) of smooth muscles can be initiated by (1) the intrinsic activity of pacemaker cells, (2) neurally released transmitters, or (3) circulating or locally generated hormones or signaling molecules. The combination of a neurotransmitter, hormone, or drug with specific receptors activates contraction by increasing cell Ca^{++} . The response of the cells depends on the concentration of the transmitters or hormones at the cell membrane and the nature of the receptors present. Hormone concentrations depend on diffusion distance, release, reuptake, and catabolism. Consequently, cells lacking close neuromuscular contacts will have a limited response to neural activity unless they are electrically coupled so that depolarization is transmitted from cell to cell. A, Multiunit smooth muscles resemble striated muscles in that there is no electrical coupling and neural regulation is important. B, Single-unit smooth muscles are like cardiac muscle, and electrical activity is propagated throughout the tissue. Most smooth muscles probably lie between the two ends of the single unit-multiunit spectrum.

END

Video 4, Module 4