Calcium plays a key role in nerve and muscle function, enzyme function, and mineral balance in bone.

Calcium affects nerve and muscle excitability, neurotransmitter release from axon terminals, and excitation–contraction coupling in muscle cells. It serves as a second or third messenger in several intracellular signal transduction pathways. Some enzymes use calcium as a cofactor, including some in the blood-clotting cascade. Finally, calcium is a major constituent of bone. Of all these roles, the one that demands the most careful regulation of *plasma calcium is the effect* of calcium on nerve excitability. *Calcium affects* the sodium permeability of nerve membranes, which influences the ease with which action potentials are triggered. Low plasma calcium (**hypocalcemia**) can lead to the generation of spontaneous action potentials in nerves. When motor neurons are affected, tetany of the muscles of the motor unit may occur; this condition is called **hypocalcemic tetany.**