Myocardium Action Potential

PLAY PICMONIC

Phase 0

(0)

Phase 0 is characterized by rapid upstroke and depolarization.

Rapid Depolarization

Rapid-rabbit D-polar-bear

Phase 0 is described as the opening of voltage-gated sodium (Na+) channels, causing the influx of sodium. This process will result in rapid depolarization.

Influx of Sodium

Salt-shakers Come in

Voltage-gated sodium (Na+) channels open, causing the influx of sodium.

Phase 1

(1) Wand

Phase 1 is characterized by early repolarization, which follows the rapid upstroke of phase 0 in the myocardial action potential.

Early Repolarization

Early-sun Red-polar-bear

Phase 1 is described as the inactivation of voltage-gated sodium (Na+) channels and the initial opening of voltage-gated potassium (K+) channels. This process will result in early repolarization.

Efflux of Potassium

Bananas Head out

Voltage-gated potassium (K+) channels start to open in phase 1, causing an efflux of potassium.

Phase 2

(2) Tutu

Phase 2 is characterized by a plateau. This phase causes the cardiac muscle to contract longer than the skeletal muscle. This is important to give time for the heart chambers to contract the blood out

Plateau

Plateau

Phase 2 is characterized by the influx of calcium (Ca2+) through voltage-gated Ca2+ channels, balancing potassium (K+) efflux and resulting in a plateau.

Influx of Calcium

Calcium-cow Come in

The influx of calcium (Ca2+) activates Ca2+ release from the sarcoplasmic reticulum, resulting in myocyte contraction through excitation-contraction coupling.

Phase 3

(3) Tree

Phase 3 is characterized by rapid repolarization.

Rapid Repolarization

Rapid-rabbit Red-polar-bear

Phase 3 is characterized by the opening of voltage-gated slow delayed-rectifier potassium (K+) channels and the closure of voltage-gated calcium (Ca2+) channels. This results in rapid repolarization.

Massive Potassium Efflux

Massive Bananas Heading out

The opening of voltage-gated slow delayed-rectifier potassium (K+) channels in phase 3 results in massive potassium (K+) efflux.

Phase 4

(4) Fork

Phase 4 is characterized by the resting potential, which represents the stable, polarized state of the cell membrane in between action potentials.

Resting Phase

Resting

Phase 4 results from the flux of ions that have flowed into and out of the cell, as well as the flux of ions generated by various membrane pumps, which are entirely balanced. Contractile cells maintain a stable resting potential of -90 mV and only depolarize when stimulated, often by neighboring myocytes