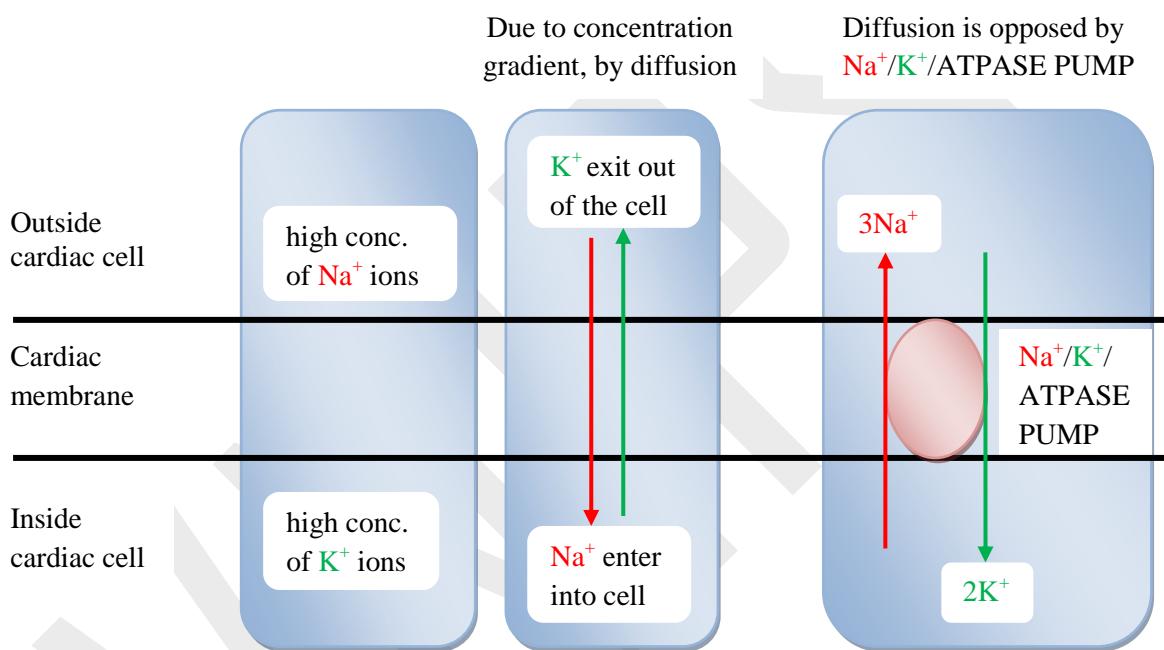


CARDIAC ACTION POTENTIAL

Generally action potential is initiated by SA node, travel along conduction system, and spreads out through auricular and ventricular fibers known as CONTRACTILE FIBERS.

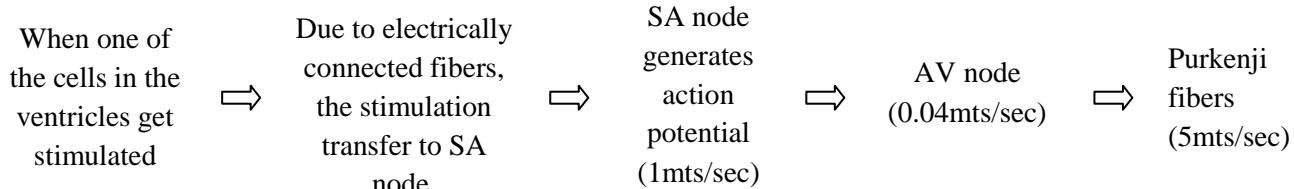
Unlike Auto rhythmic fibers, these contractile fibers have resting membrane potential about -90mv.

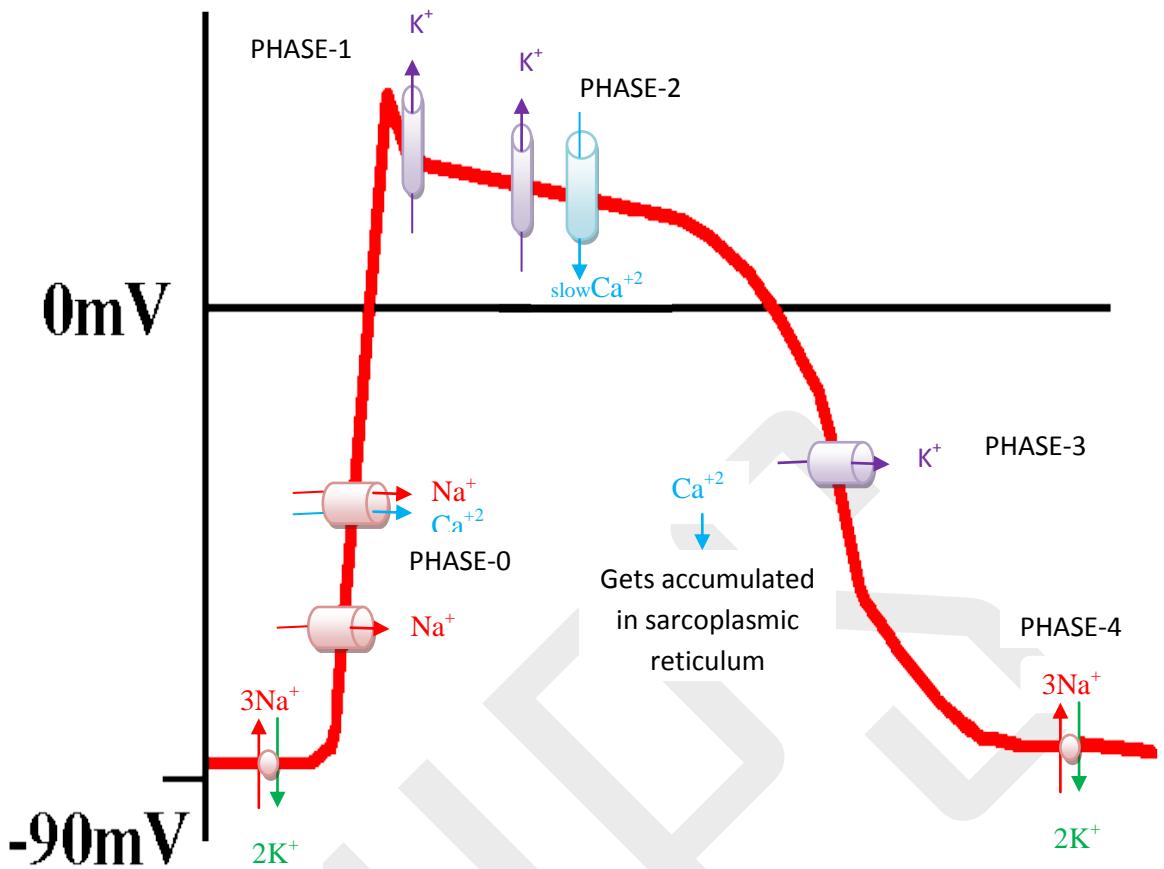
INITIALLY:



Na⁺/K⁺/ATPASE PUMP operate continuously throughout the action potential.

AT DIASTOLE:





PHASE-0 / RAPID DEPOLARISATION PHASE:

- When auricles and ventricles both receive action potential, start depolarizing by opening voltage gated fast Na^+ channels.
- Na^+ ions enter into the cell in large amounts leads to rapid depolarization.
- Along with Na^+ ions, Ca^{+2} ions also enters into the cell through voltage gated fast Na^+ channels , leads to increased Ca^{+2} ions concentration in the cytoplasm, interacts with troponin-actin-myosin complex leads to **contraction** of the cell.

PHASE-1 / PARTIAL REPOLARISATION PHASE:

- voltage gated fast Na^+ channels gets inactivated, so Na^+ ions & Ca^{+2} ions influx stops.
- K^+ ions leave out of the cell.

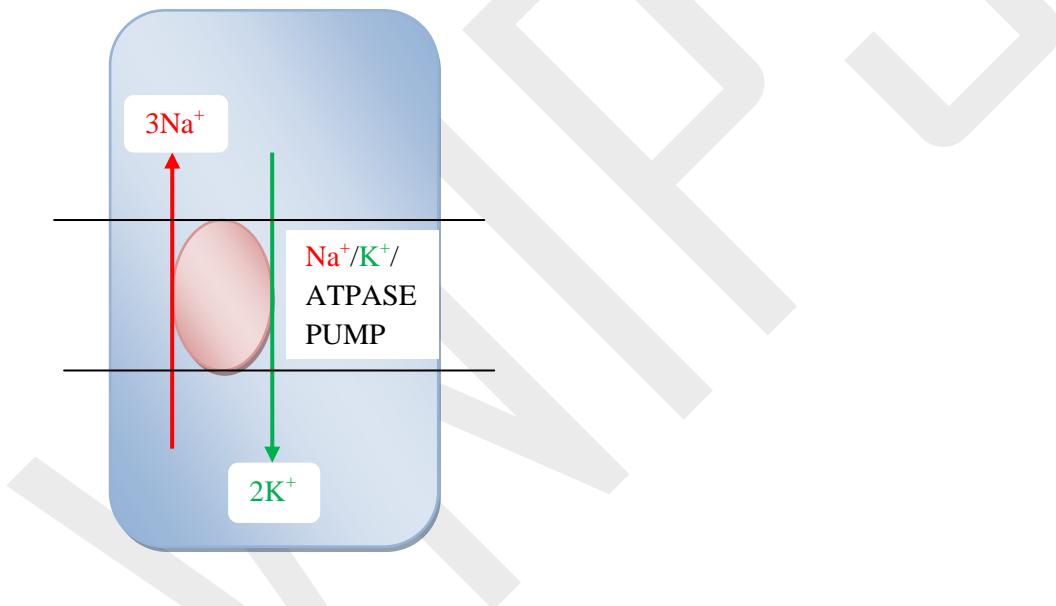
PHASE-2 / PLATEUE PHASE:

- Voltage gated slow Ca^{+2} channels opens, the Ca^{+2} ions slowly enters into the cell.
- K^{+} ions leave out of the cell.

PHASE-3 / RAPID REPOLARISATION PHASE:

- Voltage gated slow Ca^{+2} channels close.
- K^{+} ions leave out of the cell.
- Ca^{+2} ions within the cells gets reaccumulated into sarcoplasmic reticulum, thus lowering of Ca^{+2} ion levels in cytoplasm leads to **relaxation** of the cell.

PHASE-4 / PACEMAKER DEPOLARISATION:



- During the pacemaker depolarization, the in fluxed (some) Na^{+} ions enters into adjacent cells through Electrical windows or Gap Junctions. Then depolarization starts.
- Again the whole cycle is repeated.
- The process continues to all cells i.e. depolarization and repolarization. This is known as Cardiac Action Potential.