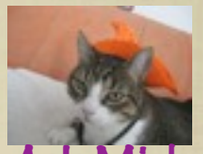
Cardiac Cell Physiology 1

Ask Mish

- 3 phases of cardiac cells:
- 1.RESTING
- 2.DEPOLARIZATION
- 3.REPOLARIZATION

- 1.At rest, cell is more negative inside than outside mainly due to ATP pumps, e.g. Na/K pump (3Na out/2K in).Proteins and phosphates are big negative molecules found inside the cell.

Cardiac Cell Physiology 2



- 2.DEPOLARIZATION:cell turns from negative to positive inside.
- The cause of depolarization is an influx of ions of Na and Ca inside the cell.
- Depolarization is propagated from cell to cell producing a wave of depolarization that can be transmitted to the entire heart.This wave represents a flow of electrons(negative charges outside),an electrical current that can be detected by electrodes placed on the surface of the body.
- 3.REPOLARIZATION:cardiac cells restore their resting polarity (negative inside)
- Cause: Na and Ca channels close and K channels open so an efflux of K ions leaves the cell.
- Repolarization can be sensed by recording electrodes.
- All of the different waves that we can see on an EKG are manifestations of these 2 processes: depolarization and repolarization.

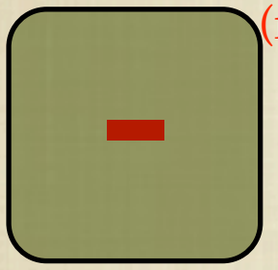
Cardiac Cell Physiology 3

	resting	depolarization	repolarization
inside of the cell	negative	positive	negative
due to	proteins phosphates Na/K pump	influx Na, Ca	efflux K
propagation from cell to cell	no	yes	yes

Cardiac Cell Physiology 4

Ask Mish

1.Resting cell=polarized cell

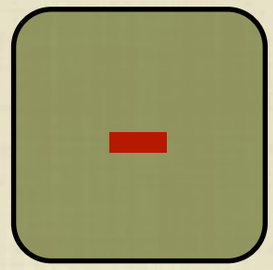


(more negative inside than outside)

2.Depolarization

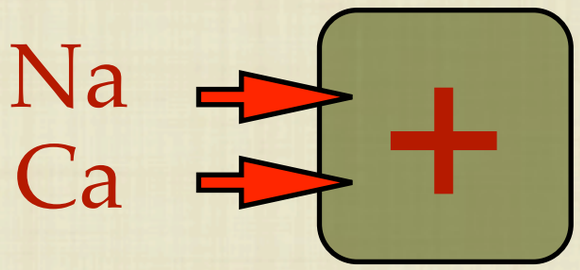
(cell turns positive inside)

3.Repolarizarion

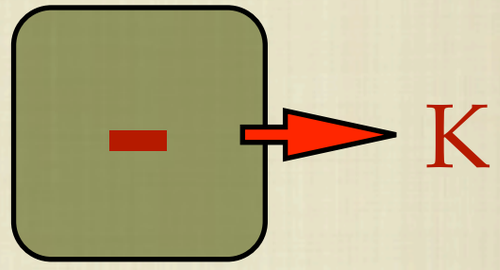


(cell returns to resting polarity)

Due to: Proteins, Phosphates, Na/K pump



influx



efflux

	MEMBRANE POTENTIAL	ACTION POTENTIAL
def	difference in electrical charge (voltage) across the cell membrane in resting state	short living event including Depolarization and Repolarization
cell	ALL CELLS	EXCITATORY CELLS only (nerve,cardiac*,muscle,endocrine)