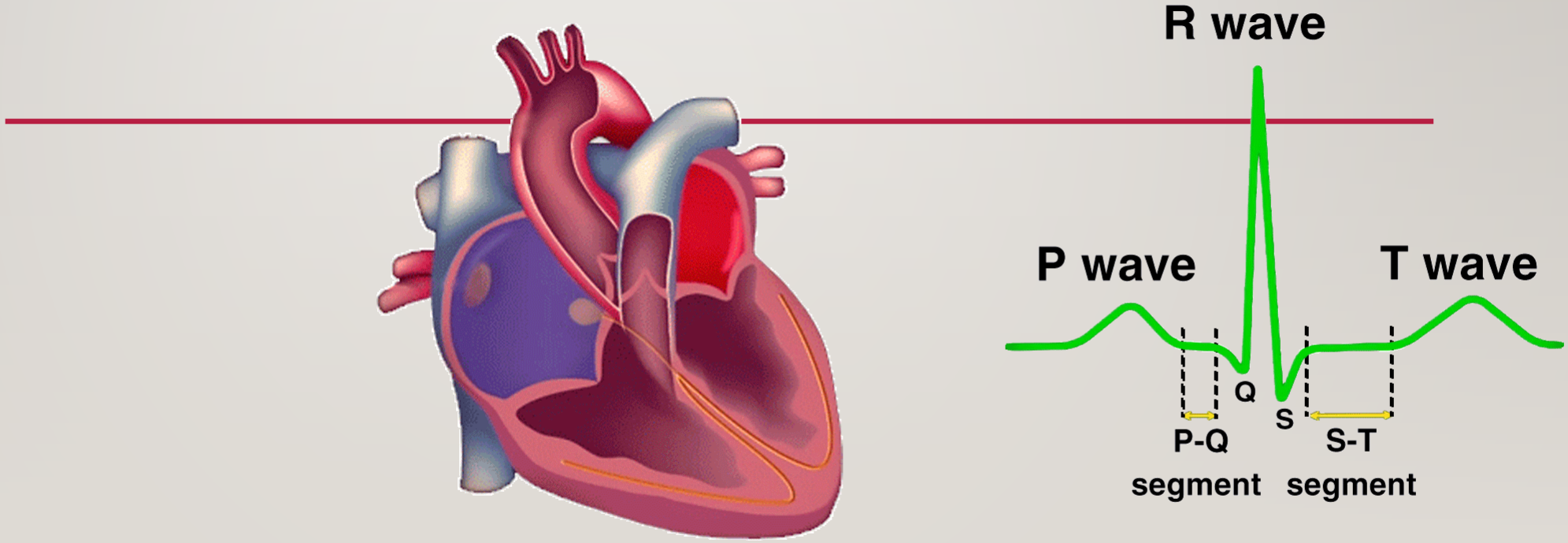
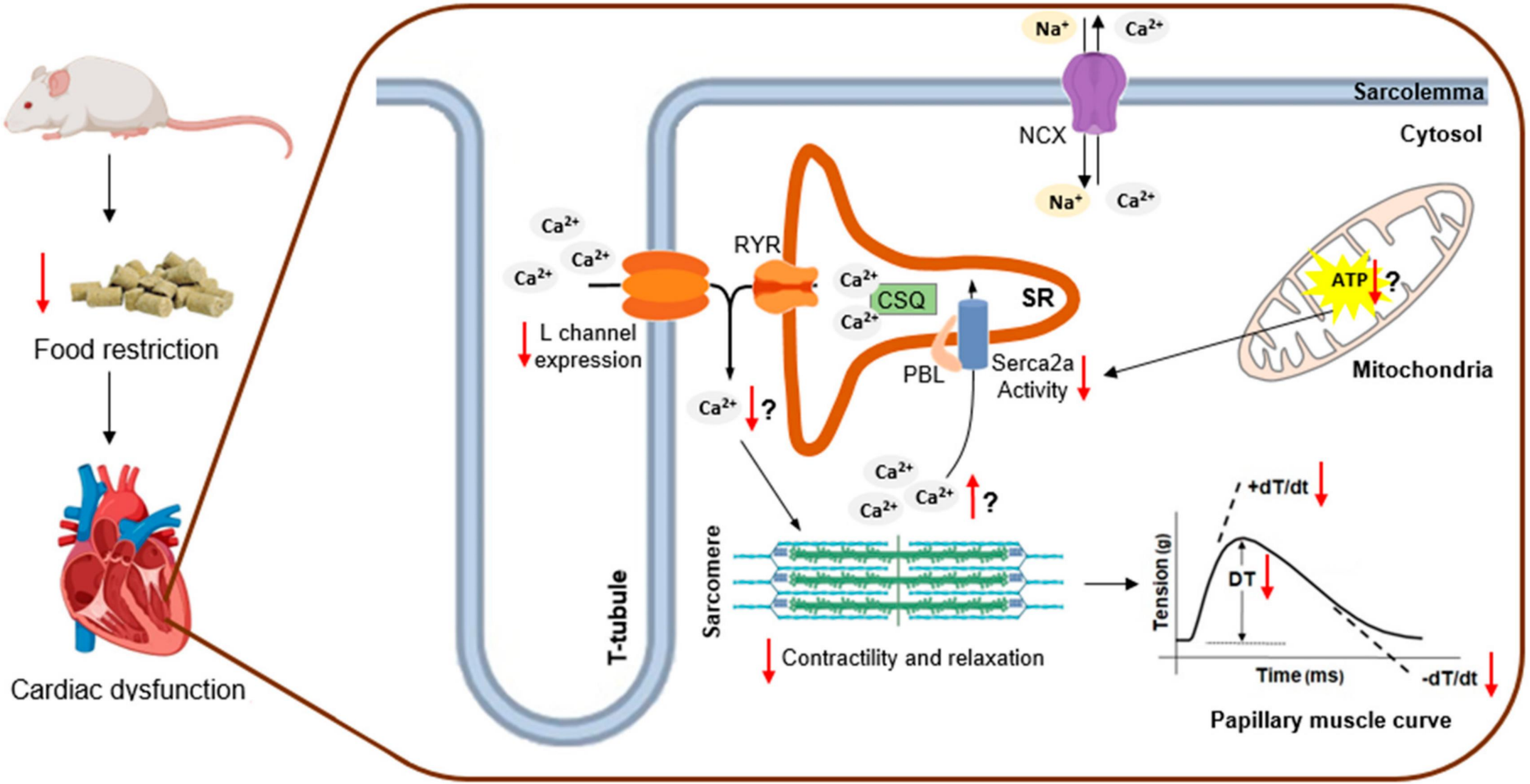
KALP KASILMA KAYITLARININ KAYDEDİLMESİ

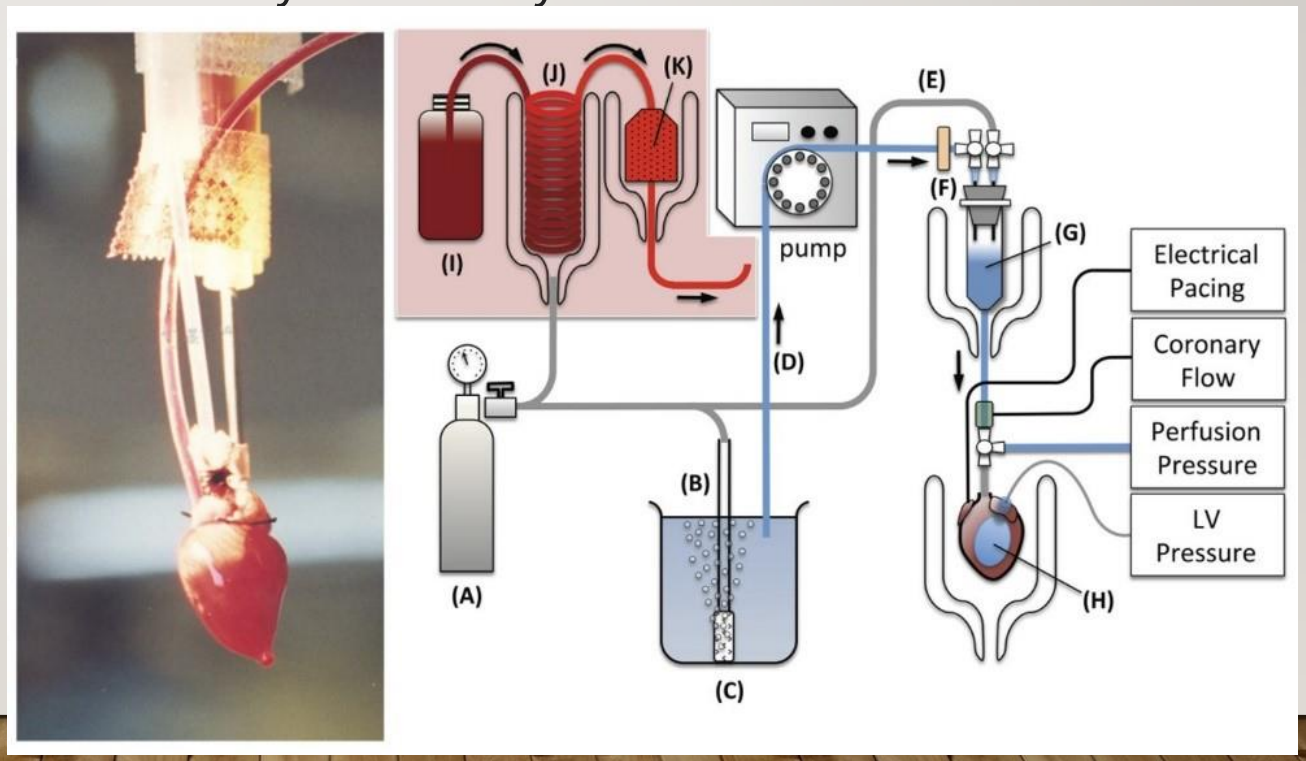
ASSOC. PROF. ERKAN TUNCAY

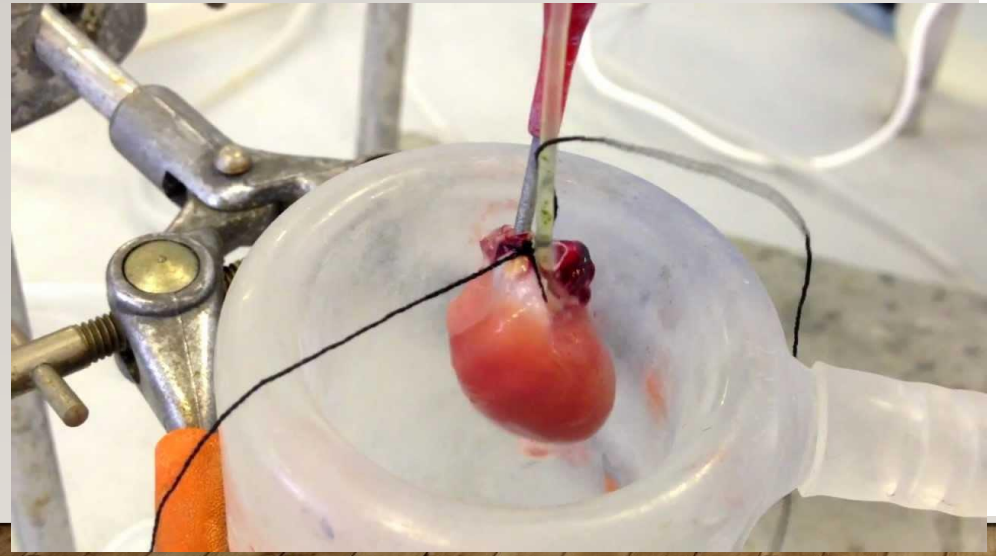


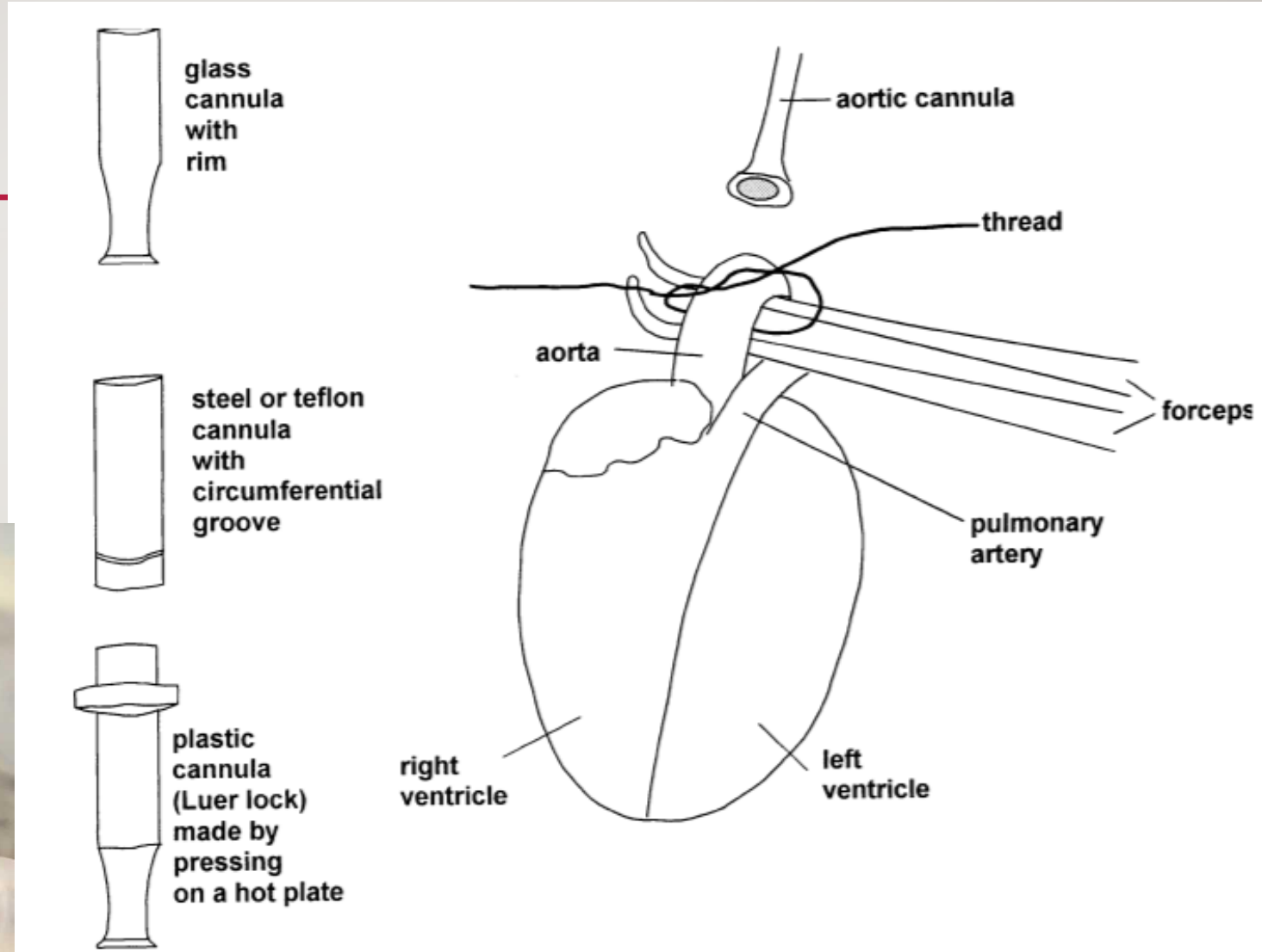

Food restriction
Cardiac dysfunction
Na+
Ca2+
Sarcolemma
NCX
Cytosol
Ca2+
RYR
CSQ
SR
L channel expression
PBL
Serca2a Activity
ATP
?
Mitochondria
T-tubule
Sarcomere
Contractility and relaxation
+dT/dt
DT
Tension (g)
Time (ms)
-dT/dt
Papillary muscle curve

LANGENDORFF PERFUSYON SISTEMI

- In 1898, Oskar Langendorff published the foundations of the *ex vivo* Langendorff perfusion technique which is still commonly used today.

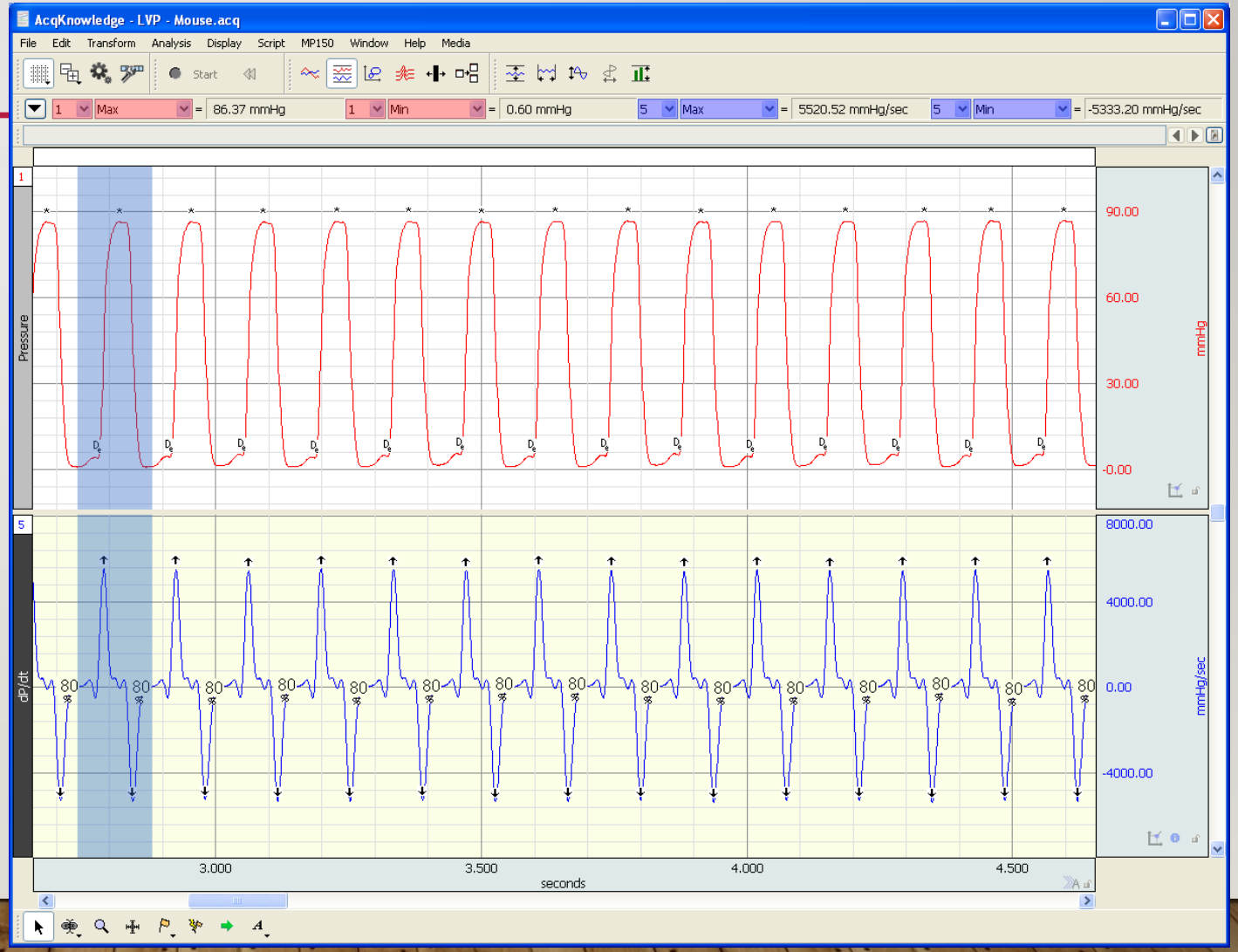





glass cannula with rim
steel or teflon cannula with circumferential groove
plastic cannula (Luer lock) made by pressing on a hot plate
aortic cannula
thread
aorta
forceps
pulmonary artery
right ventricle
left ventricle

KAYITLARIN ALINMASI

- aortic flow AF
- coronary flow CF
- cardiac output CO
- aortic pressure AP
- ventricular pressure
- electric activity (ECG)



EX VIVO ÇALIŞMALARININ AVANTAJLARI

- Quick, relatively cheap, and easy to perform technique
- High reproducibility, large number of experiments
- Suitable for screening
- Broad spectrum of biochemical, physiological, morphological and
- pharmacological studies
- Suitable for investigating cardiac-specific effects
- Controlled environment
- Ischemia/reperfusion
- Allows those experiments to be continued which would lead to
- termination of an in vivo experiment (e.g. infarction-induced loss ofpump function, cardiac arrest or arrhythmias)

EX VIVO ÇALIŞMALARININ DEZAVANTAJLARI

- in vivo modele göre daha az fizyolojiktir
- Zamana bağlı olarak örnekler bozulabilmektedir
- Sadece akut çalışmalar yapılabilir (genellikle 3 saatten daha az)

SIÇANDAN İZOLE EDİLEN PAPİLER KASTA KASILMA DENEYLERİ

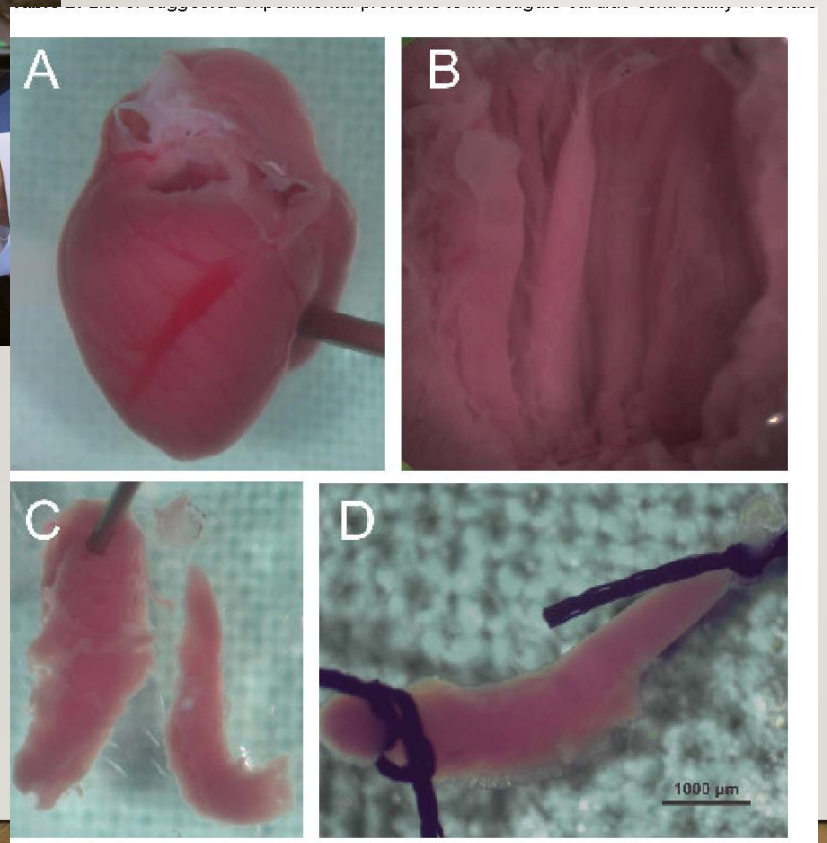
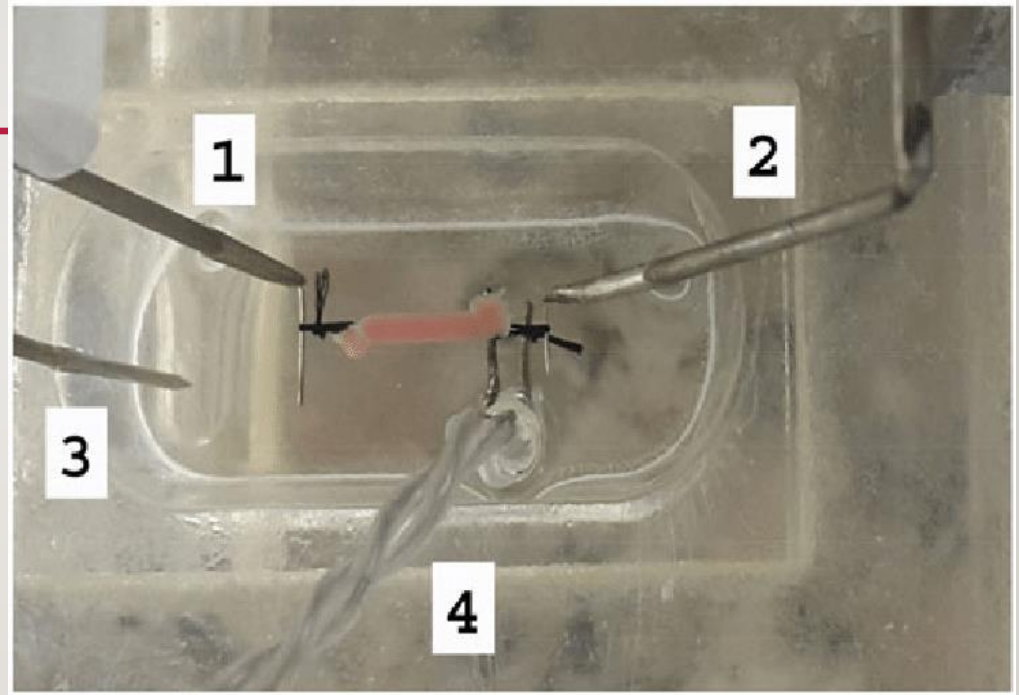
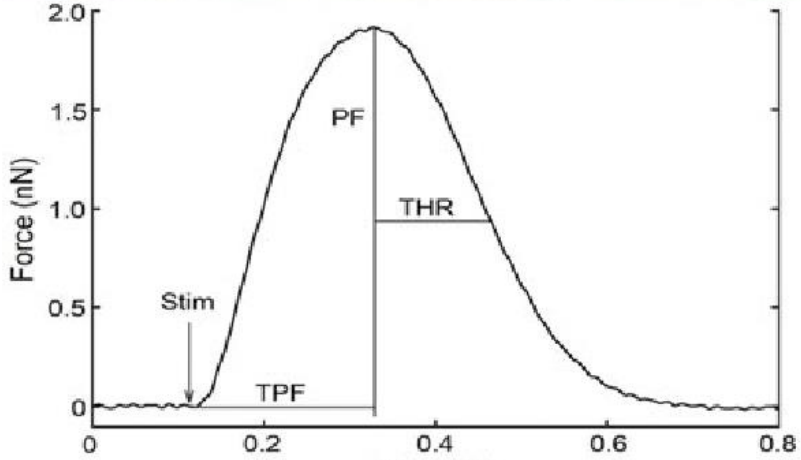
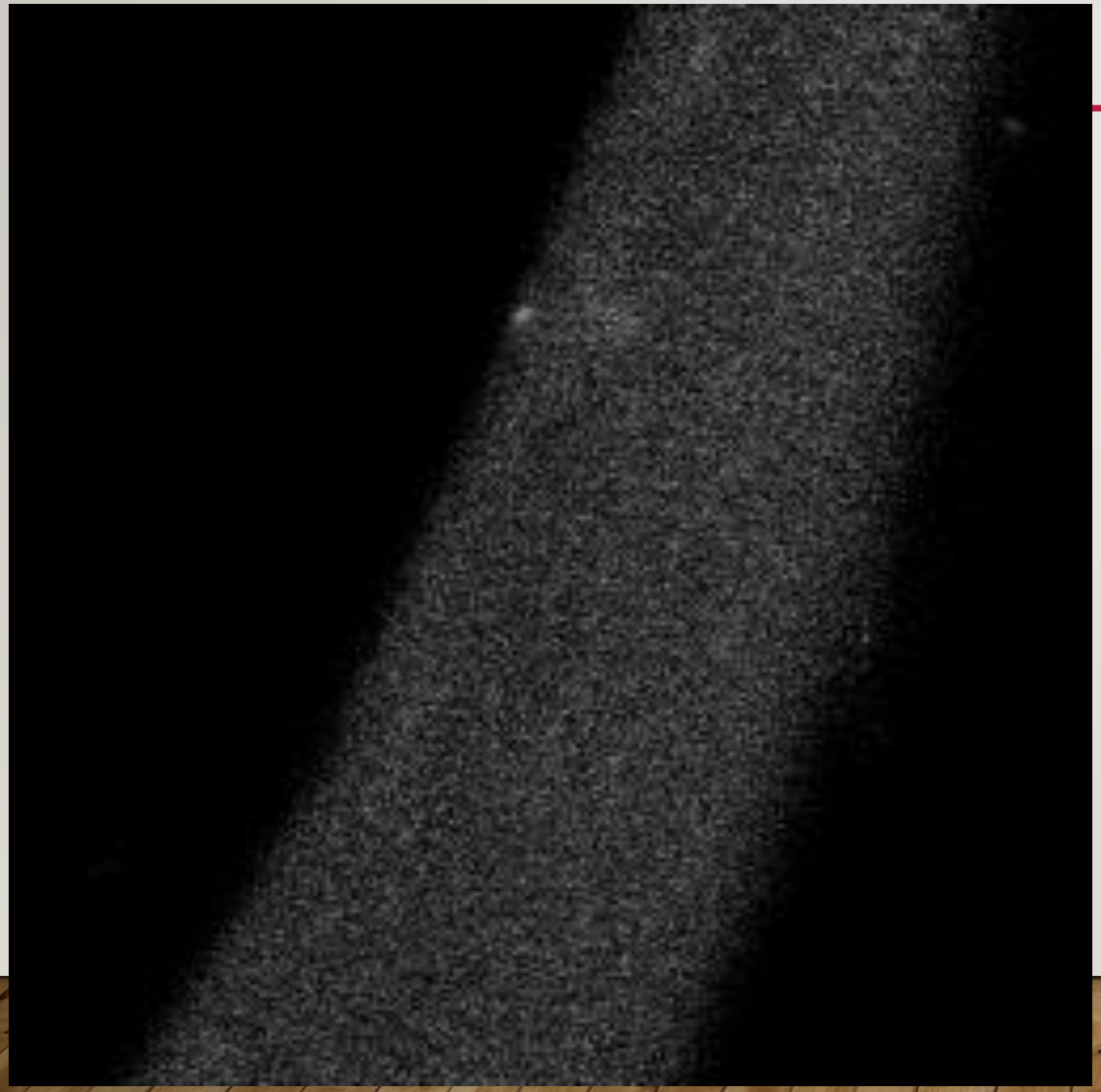


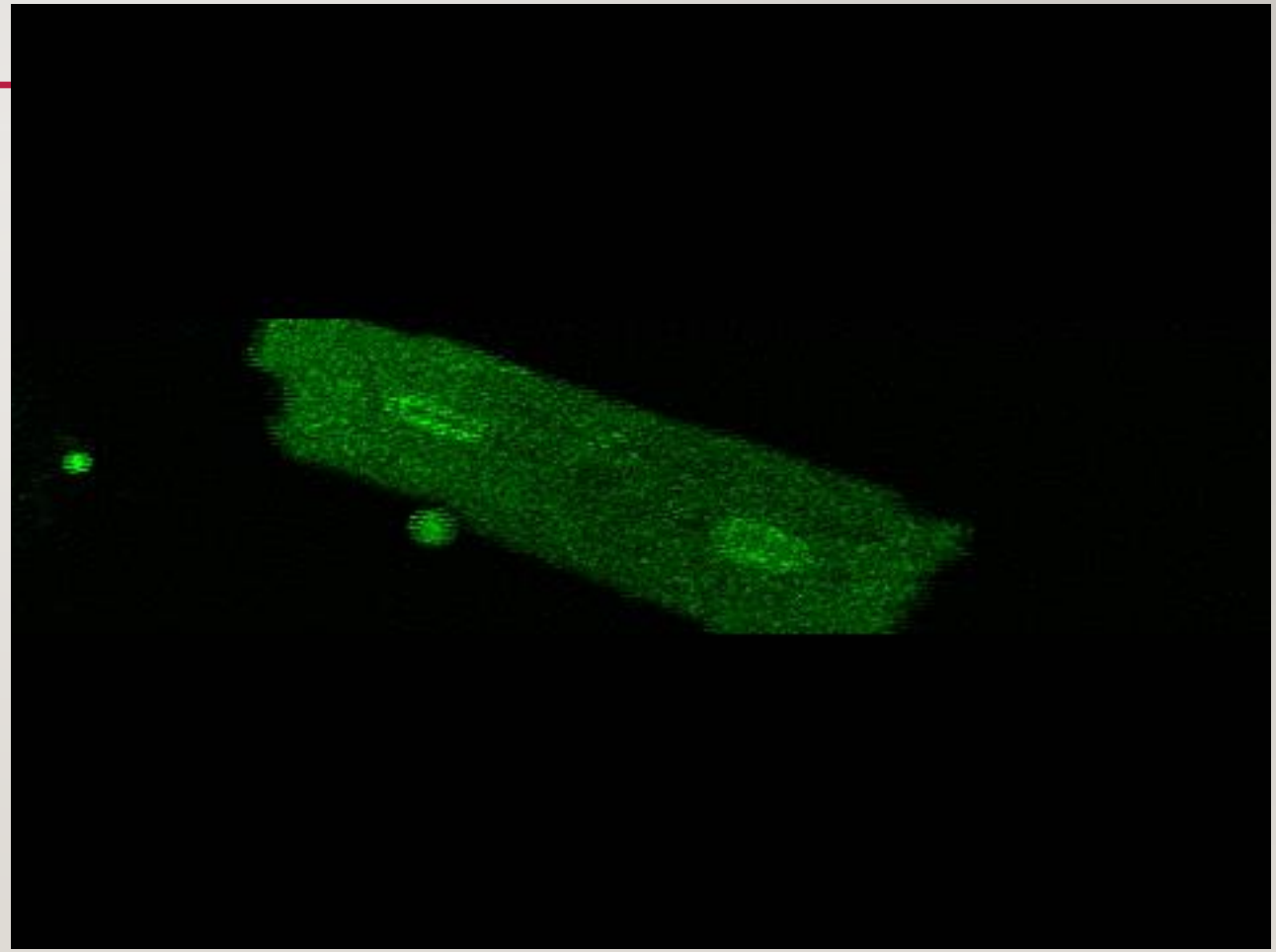
Figure 1. Key steps of the papillary muscle preparation. (A) Dissection of both atria. (B) V



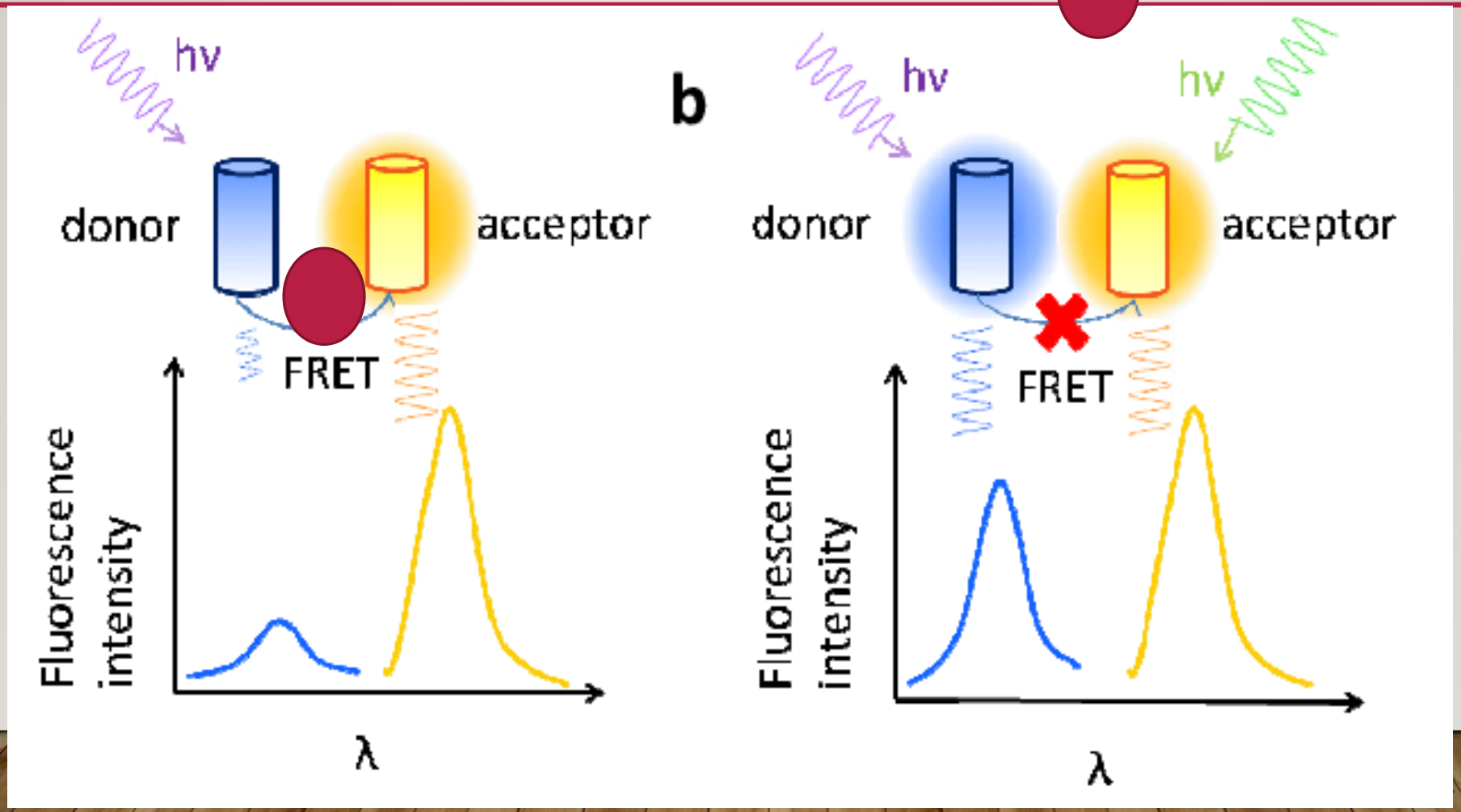


HÜCRE İÇİ İYON GÖRÜNTÜLEME:

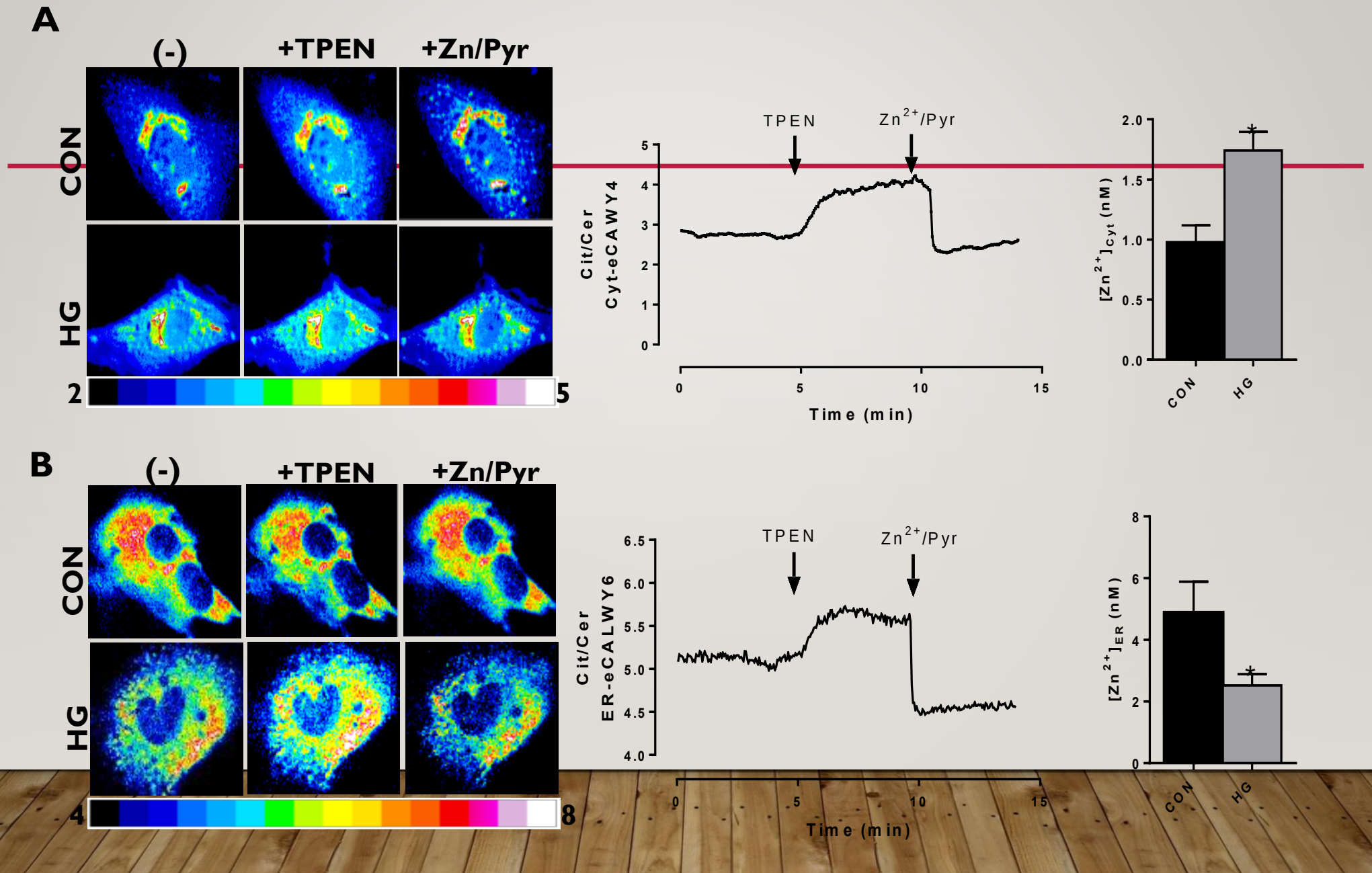




FLUORESCENCE RESONANCE ENERGY TRANSFER (FRET) YÖNTEMİ



Cytosolic and S(E)R Free Zn2+ Levels in H9c2 cells



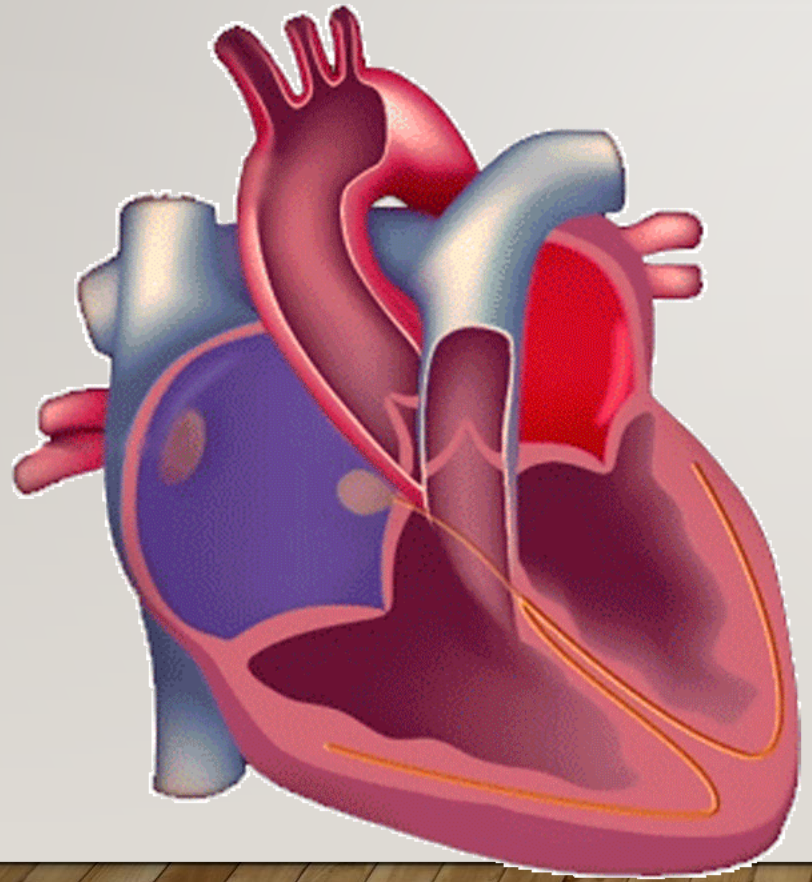
ELECTROCARDIOGRAM (ECG OR EKG)

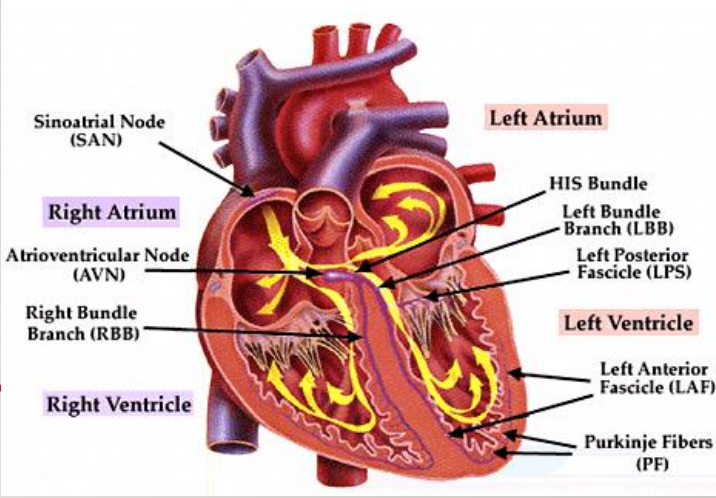
- An electrocardiogram (ECG) is a simple test that can be used to check your heart's rhythm and electrical activity.
- By examining changes from normal on the ECG, clinicians can identify a multitude of cardiac disease processes.

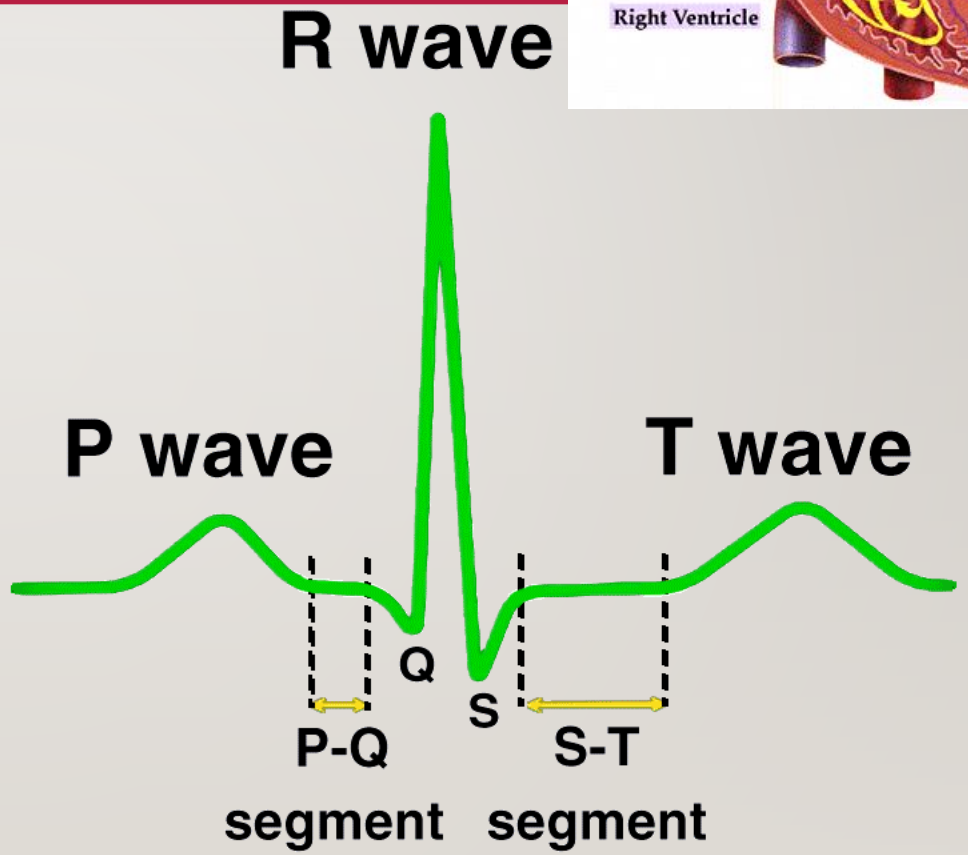
ELECTROCARDIOGRAM

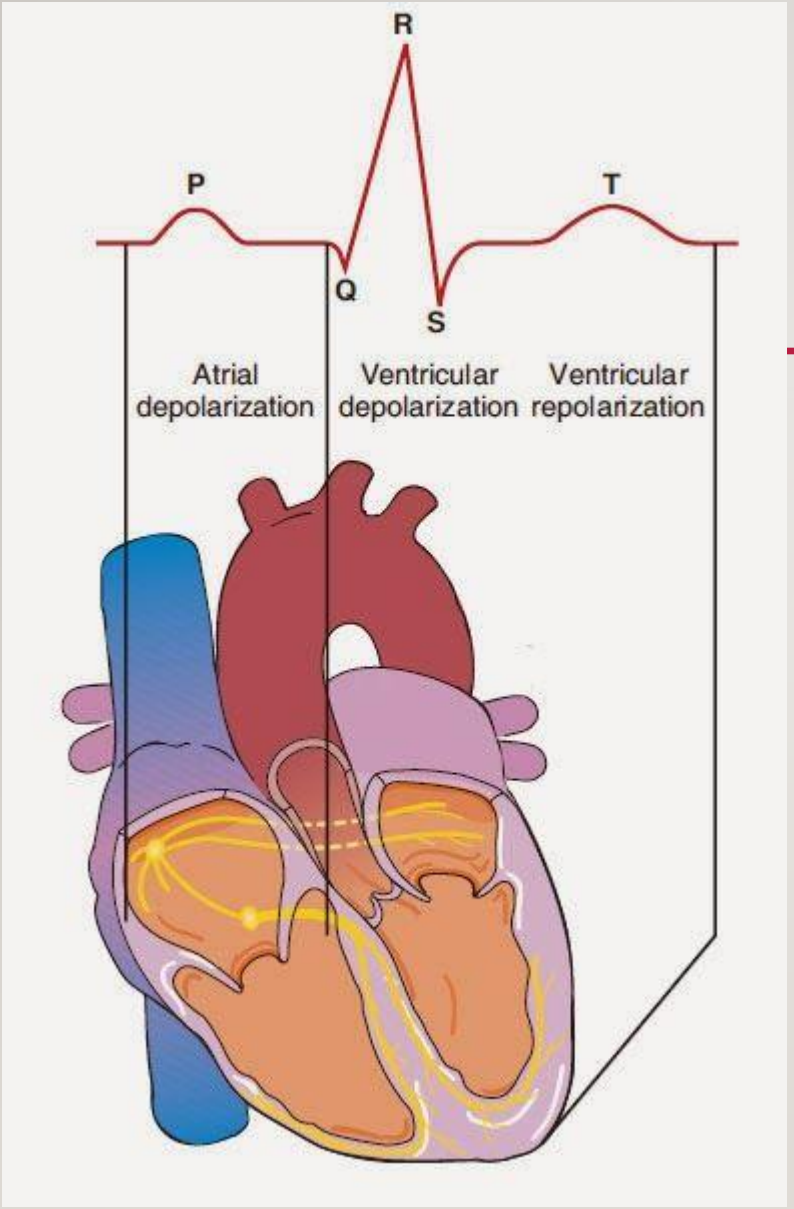
- **Wave:** A positive or negative deflection from baseline that indicates a specific electrical event. The waves on an ECG include the P wave, Q wave, R wave, S wave, T wave and U wave.
- **Interval:** The time between two specific ECG events. The intervals commonly measured on an ECG include the PR interval, QRS interval (also called QRS duration), QT interval and RR interval.
- **Segment:** The length between two specific points on an ECG that are supposed to be at the baseline amplitude (not negative or positive). The segments on an ECG include the PR segment, ST segment and TP segment.
- **Complex:** The combination of multiple waves grouped together. The only main complex on an ECG is the QRS complex.
- **Point:** There is only one point on an ECG termed the J point, which is where the QRS complex ends and the ST segment begins.

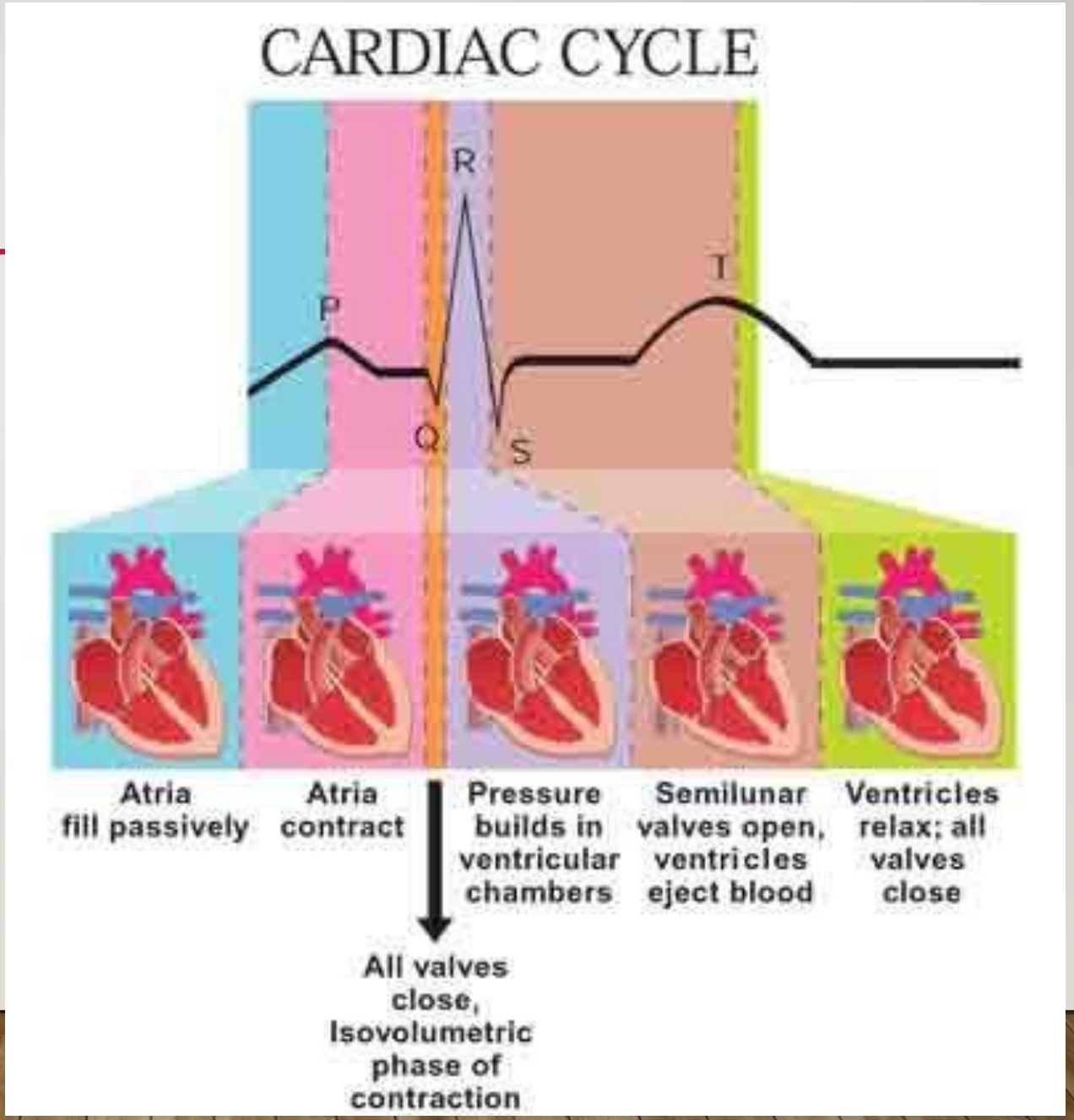
CONDUCTION

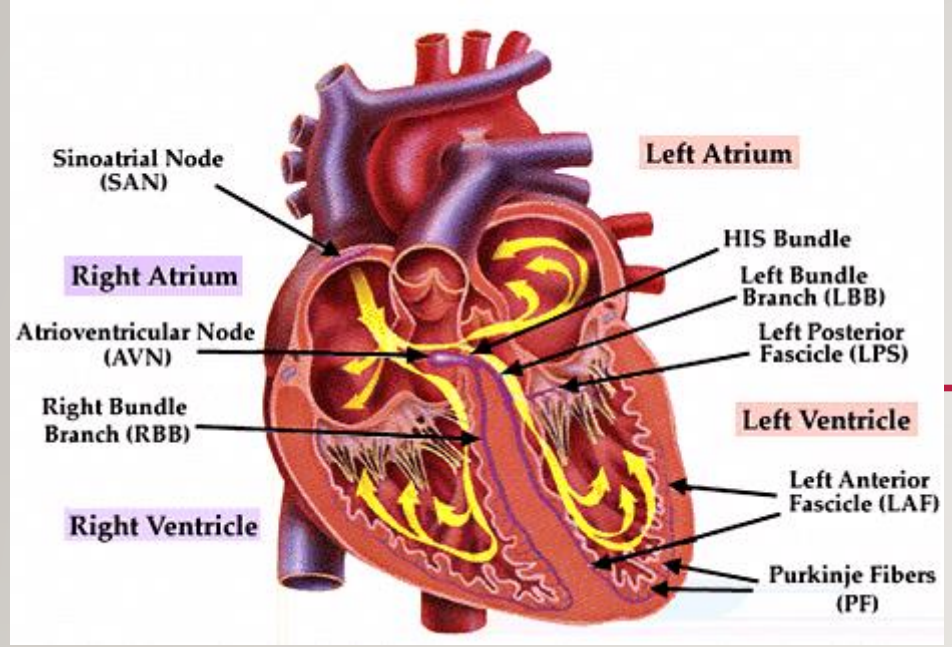


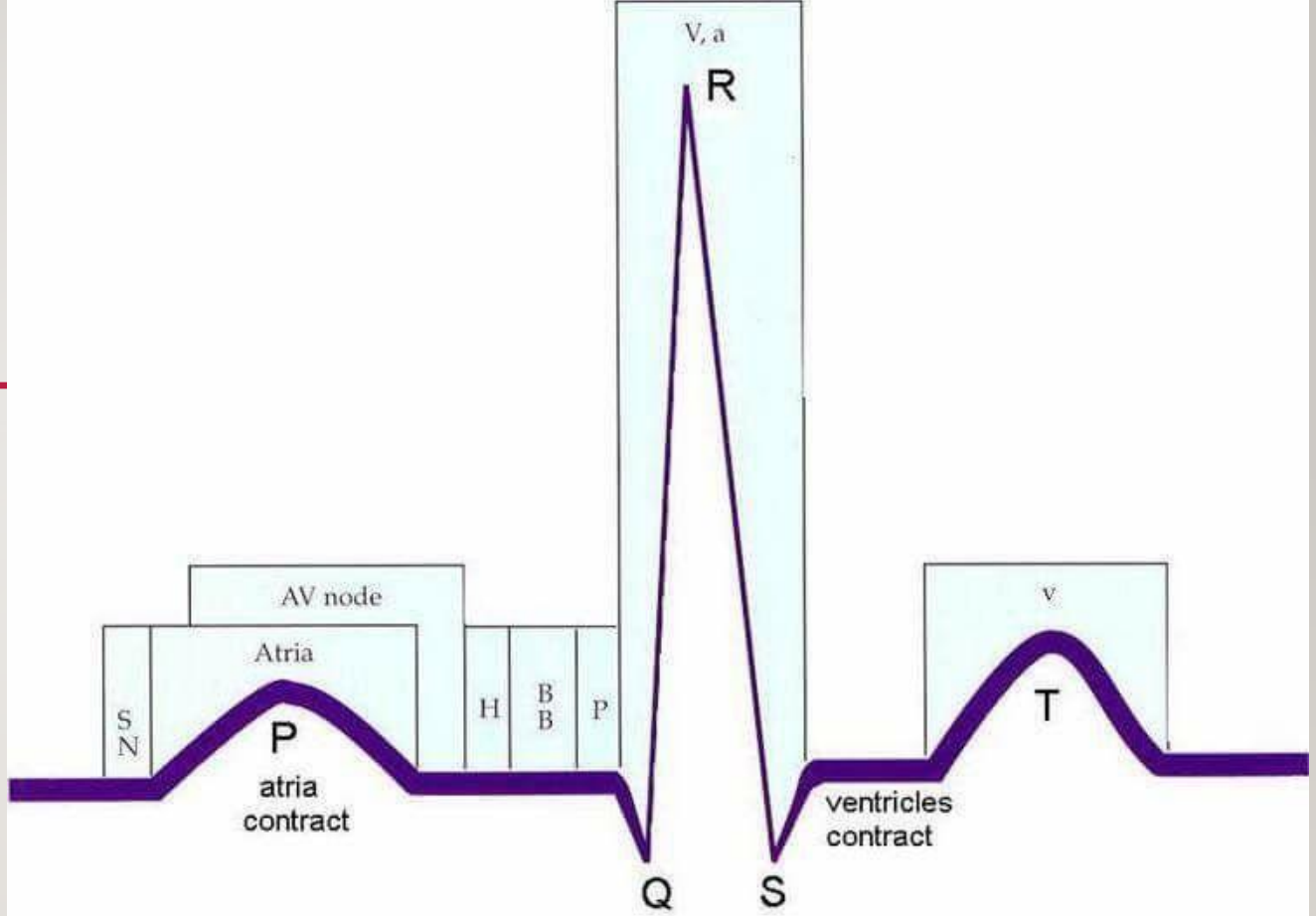

Sinoatrial Node (SAN)
Left Atrium
HIS Bundle
Right Atrium
Left Bundle Branch (LBB)
Atrioventricular Node (AVN)
Left Posterior Fascicle (LPS)
Right Bundle Branch (RBB)
Left Ventricle
Left Anterior Fascicle (LAF)
Right Ventricle
Purkinje Fibers (PF)


R wave
P wave
T wave
Q
S
P-Q segment
S-T segment


R
P
T
Q
S
Atrial depolarization
Ventricular depolarization
Ventricular repolarization


CARDIAC CYCLE
R
P
T
Q
S
Atria fill passively
Atria contract
Pressure builds in ventricular chambers
Semilunar valves open, ventricles eject blood
Ventricles relax; all valves close
All valves close, Isovolumetric phase of contraction



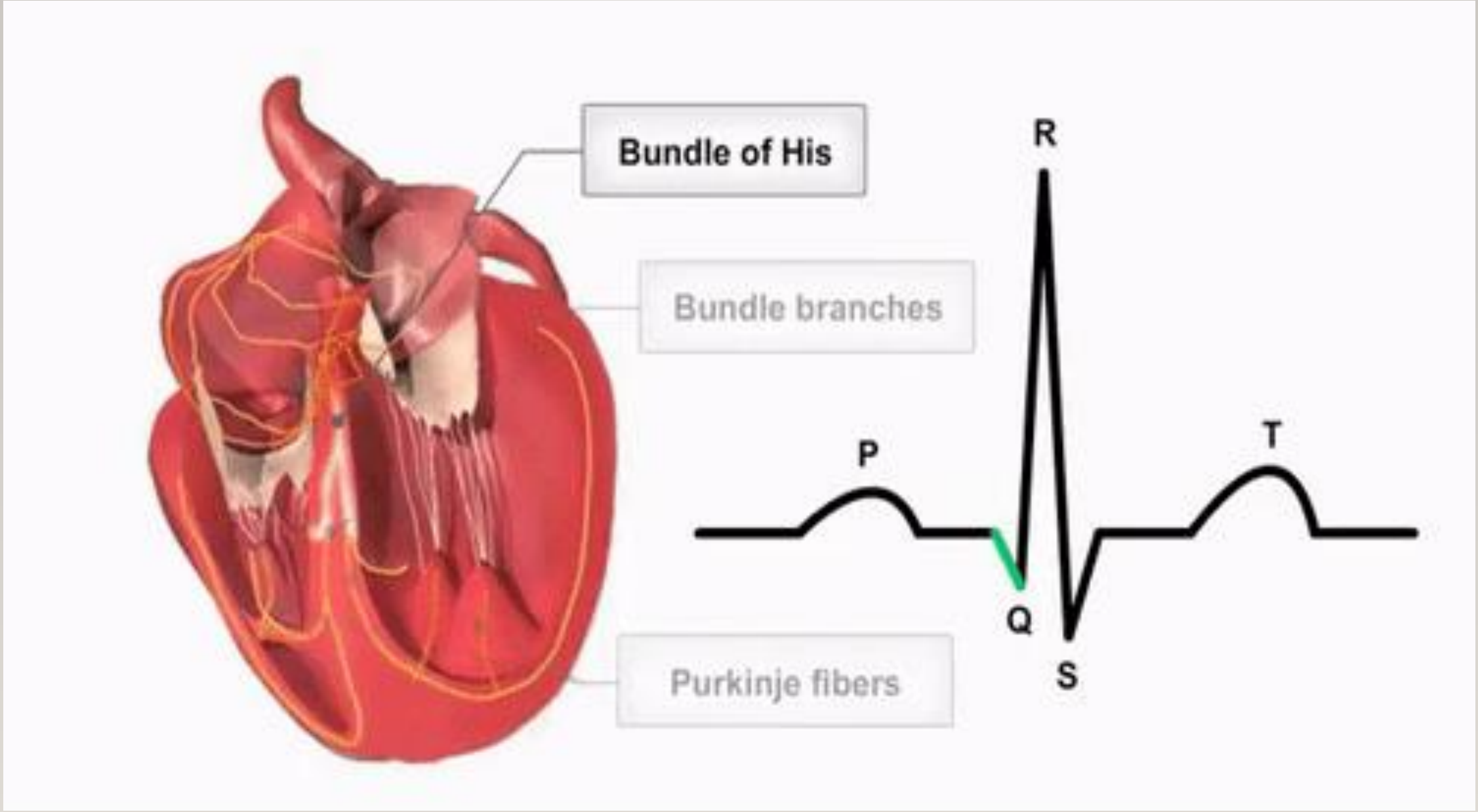


Depolarization in:

electrical signal begins in SA node	SN	Sinoatrial node
	Atria	Right atrium and left atrium
electrical signal reaches the	AV node	Atrioventricular node
electrical signal reaches the	H	Bundle of His
	BB	Bundle branches
	P	Purkinje network
electrical signal reaches the	V	Right ventricle and left ventricle

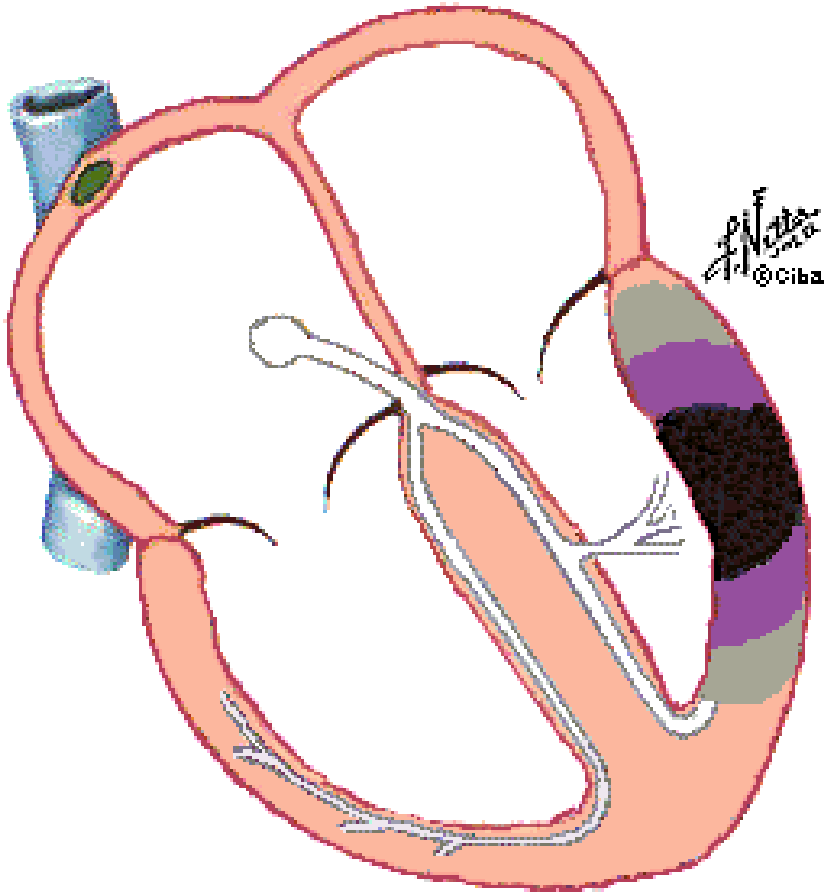
Repolarization:

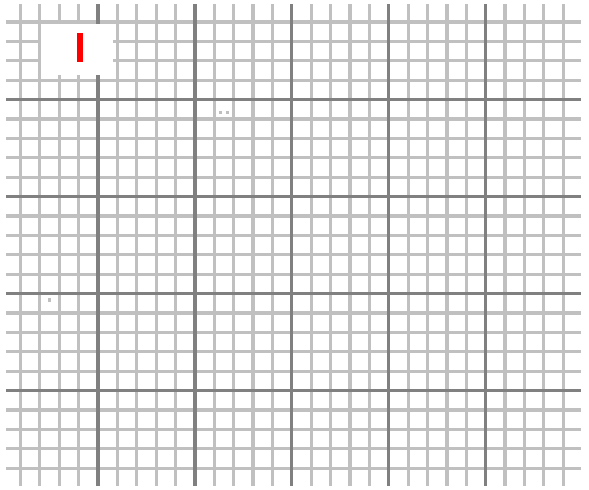
a	Right atrium and left atrium
v	Right ventricle and left ventricle


Bundle of His
Bundle branches
Purkinje fibers
R
P
T
Q
S

Differential Diagnosis of Q Waves

Presence of significant Q wave

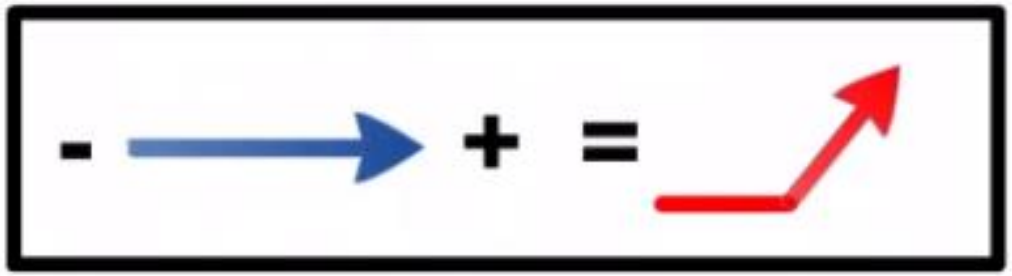


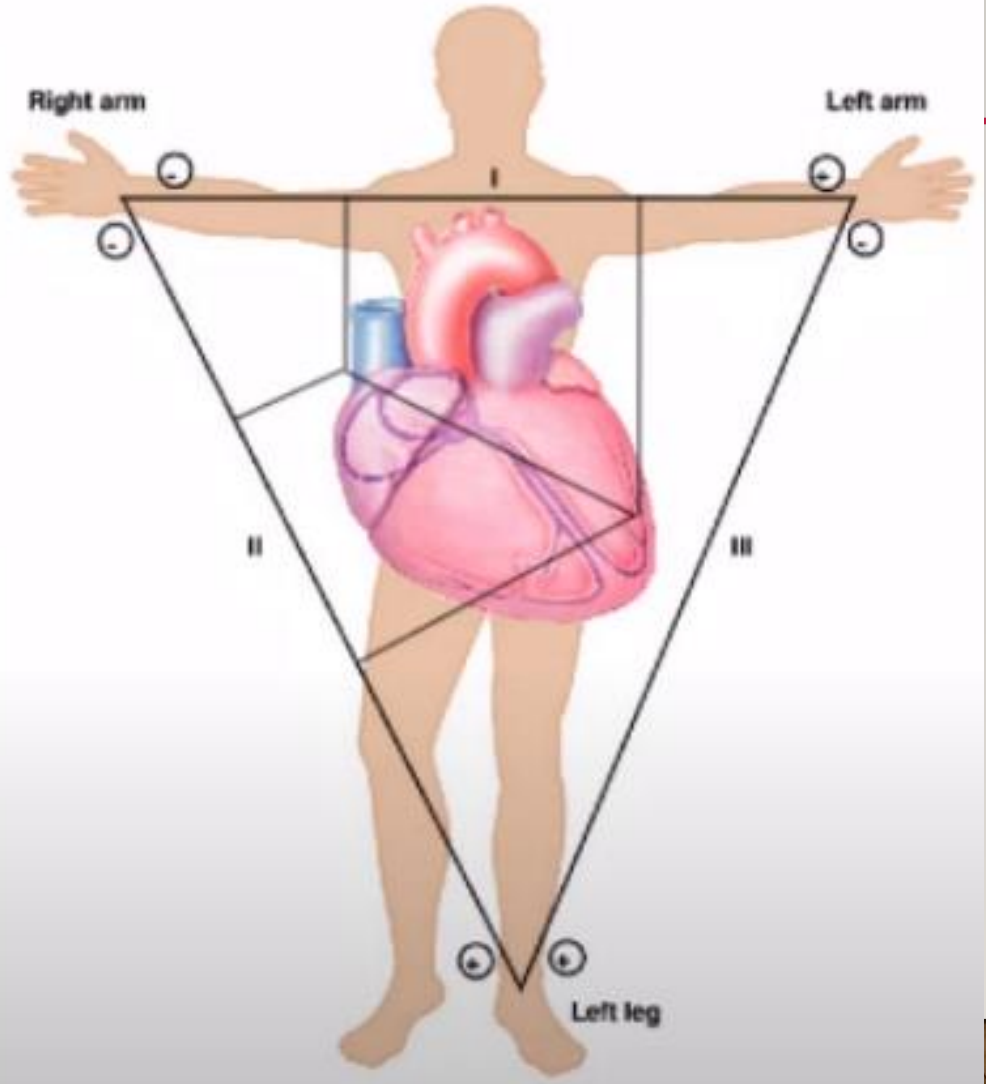


CARDIAC DIPOLE

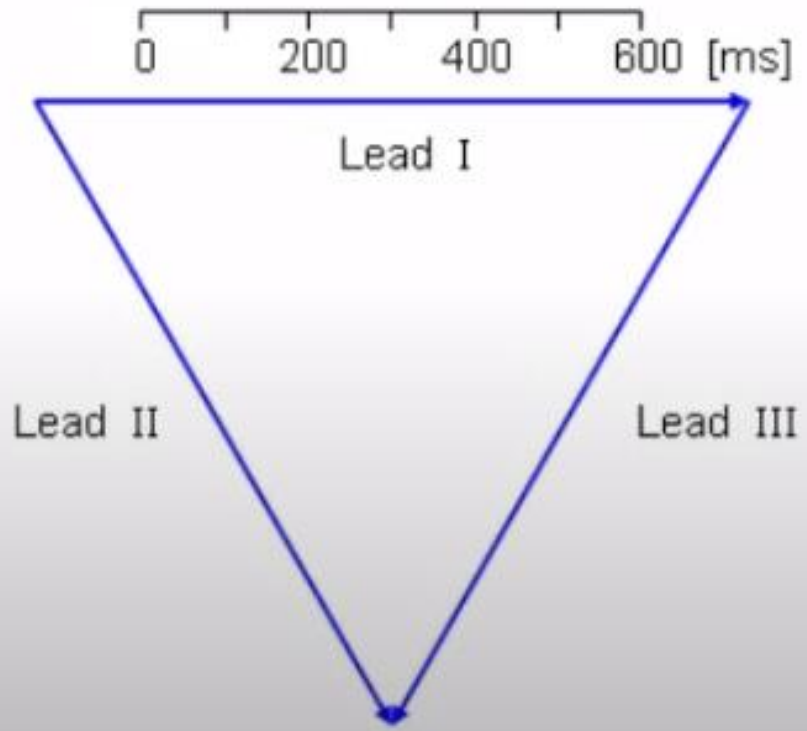
- The **cardiac dipole** is a vector which has both a direction (from the most negative to most positive regions of the **heart**) as well as an amplitude (voltage). Several electrodes are placed on the body to “look” at the **cardiac dipole** from different points of view.

The ECG

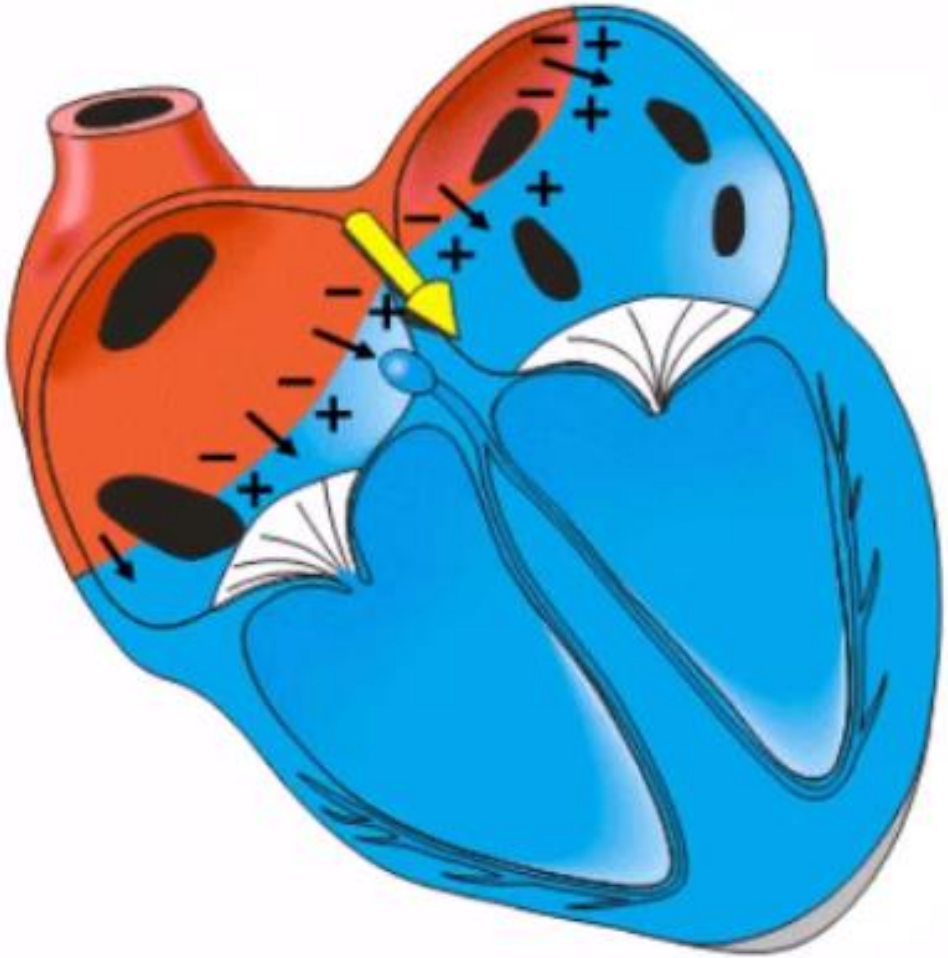


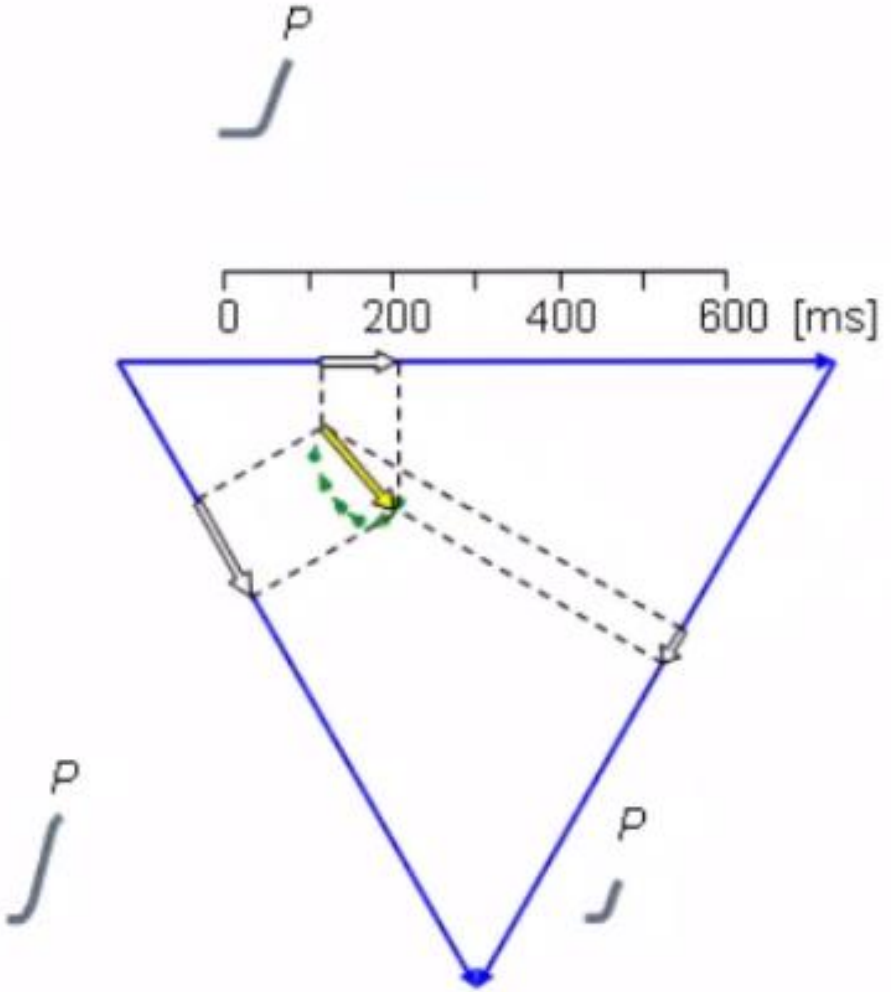


SINUS NODE
0 ms

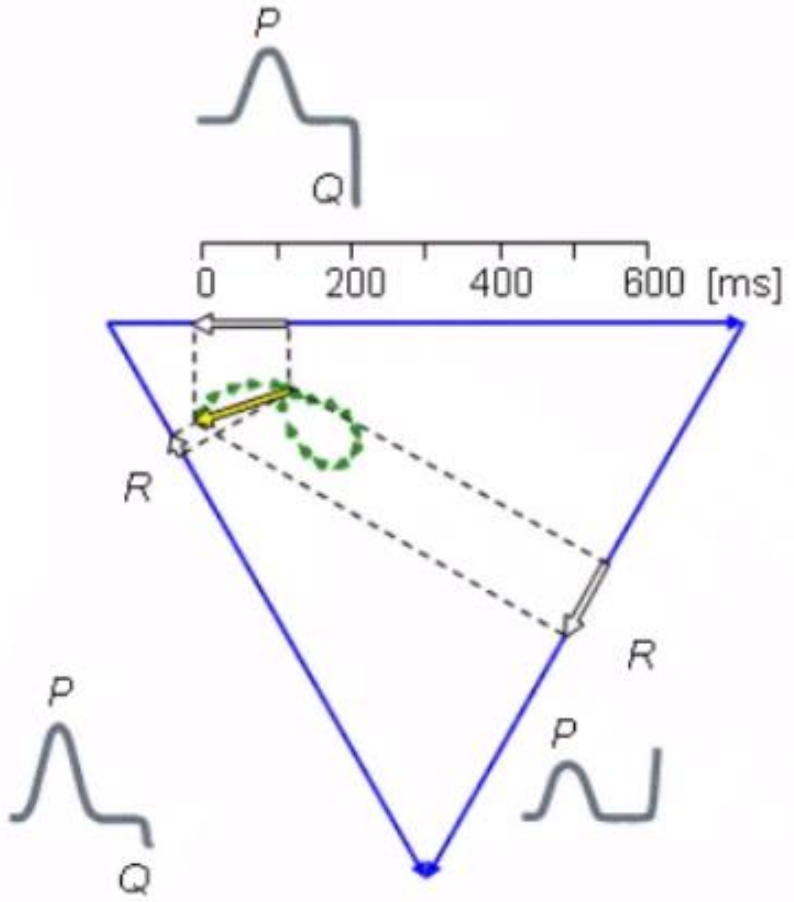


ATRIAL DEPOLARIZATION
80 ms

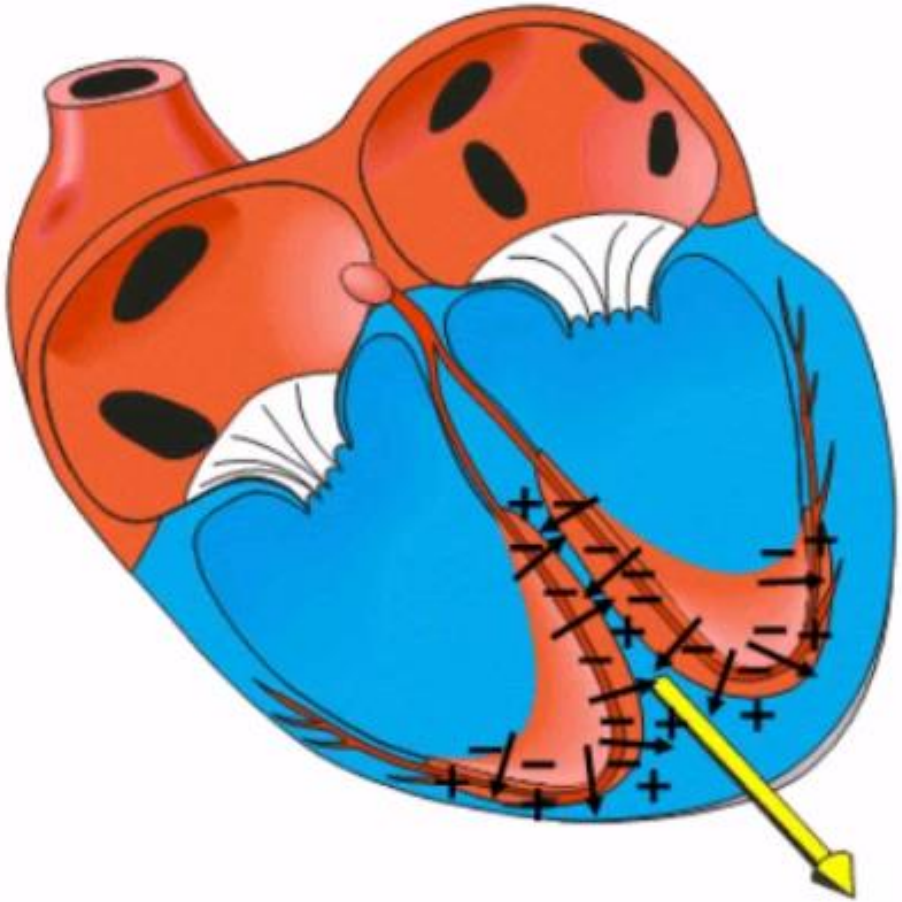


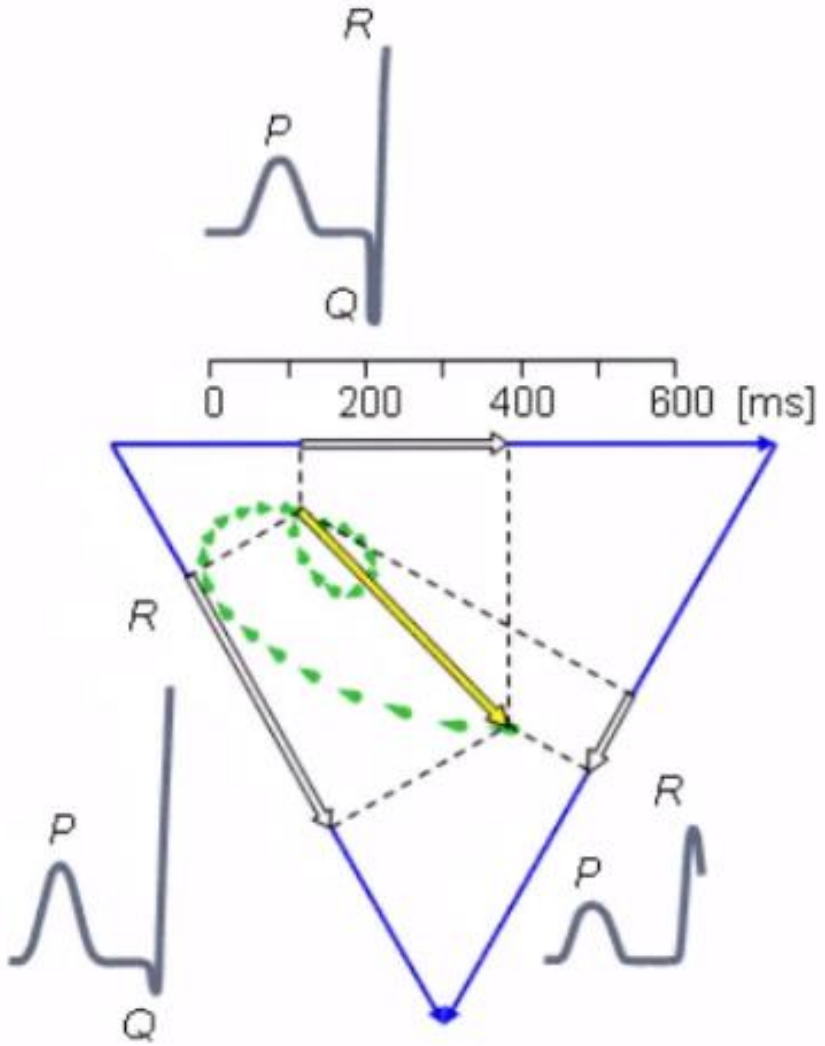


SEPTAL DEPOLARIZATION
220 ms

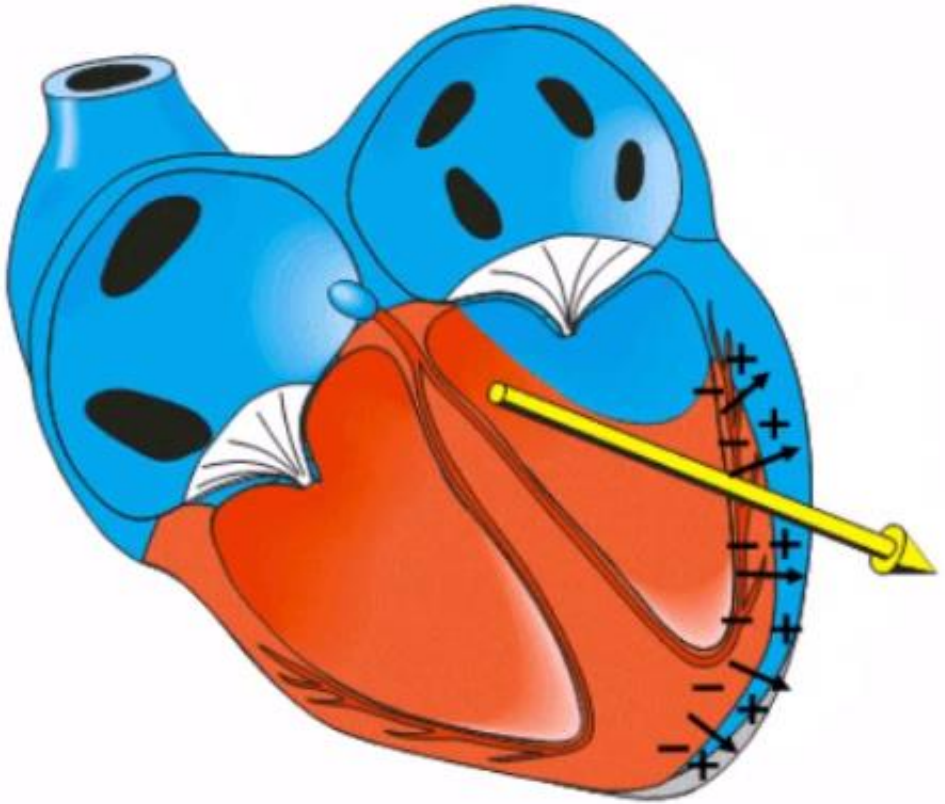


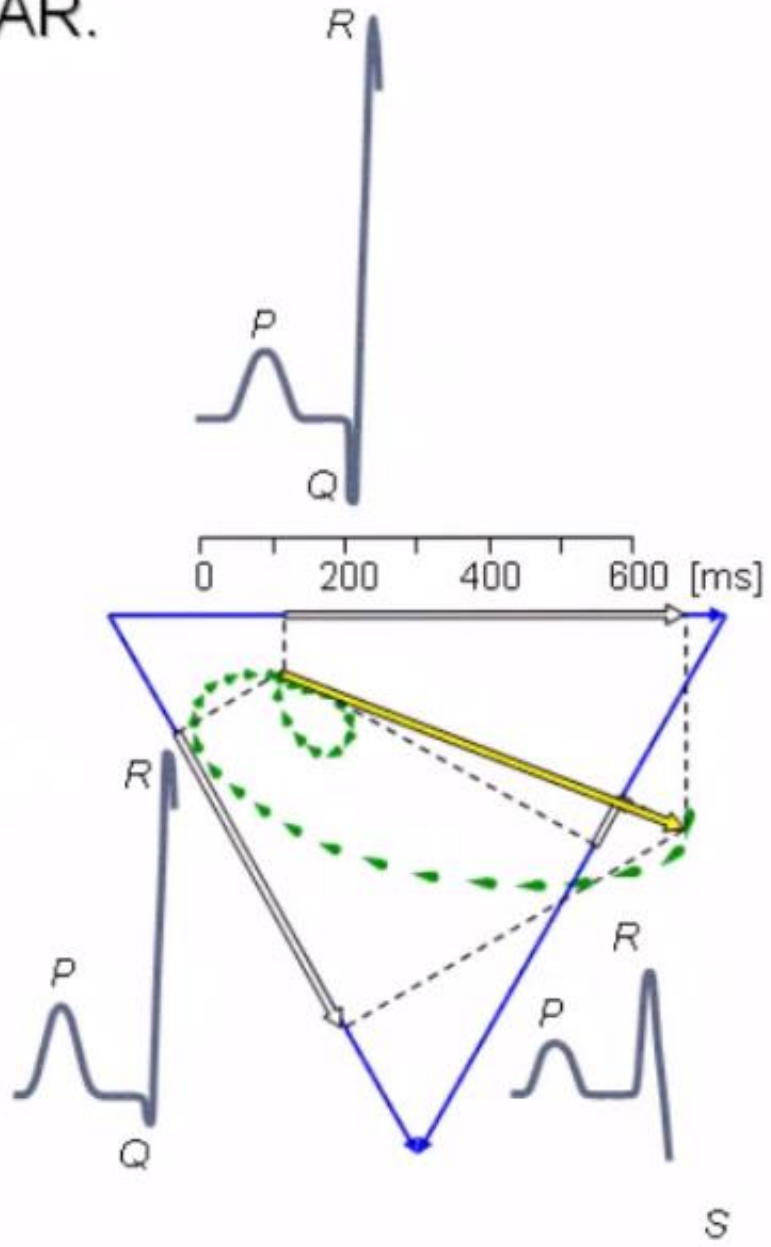
APICAL DEPOLARIZATION
230 ms



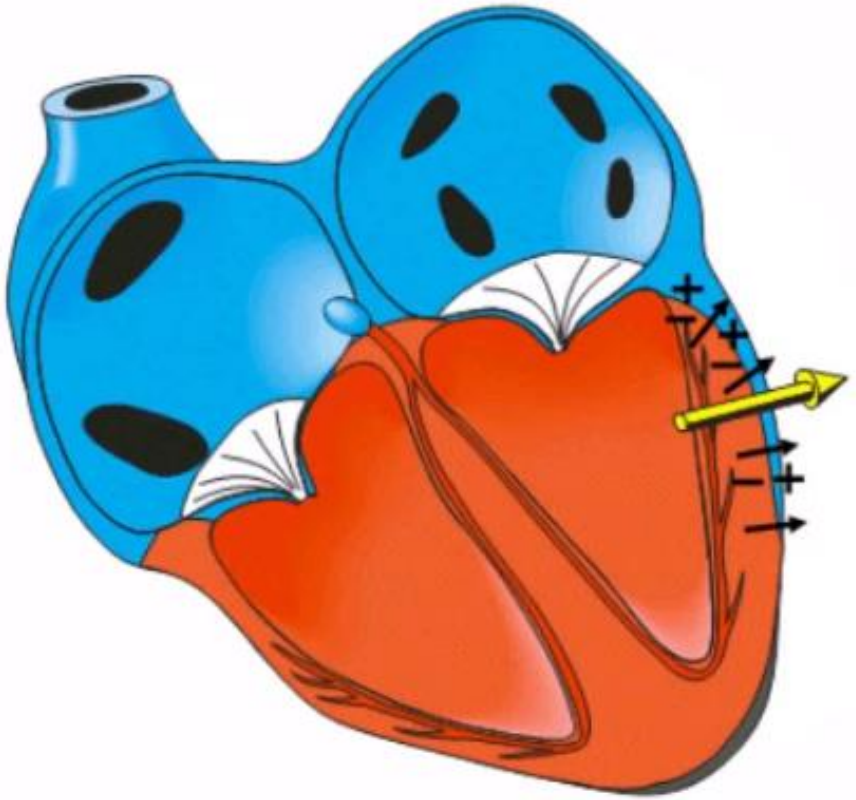


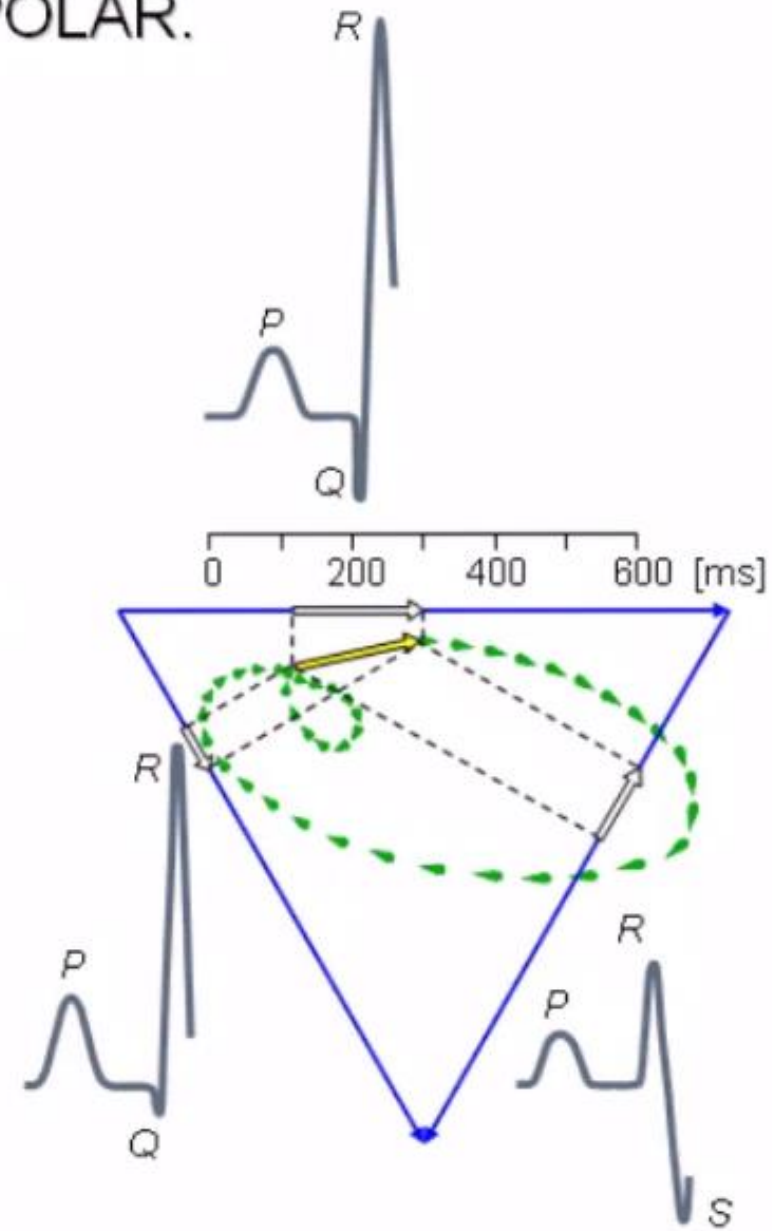
LEFT VENTRICULAR DEPOLAR.
240 ms



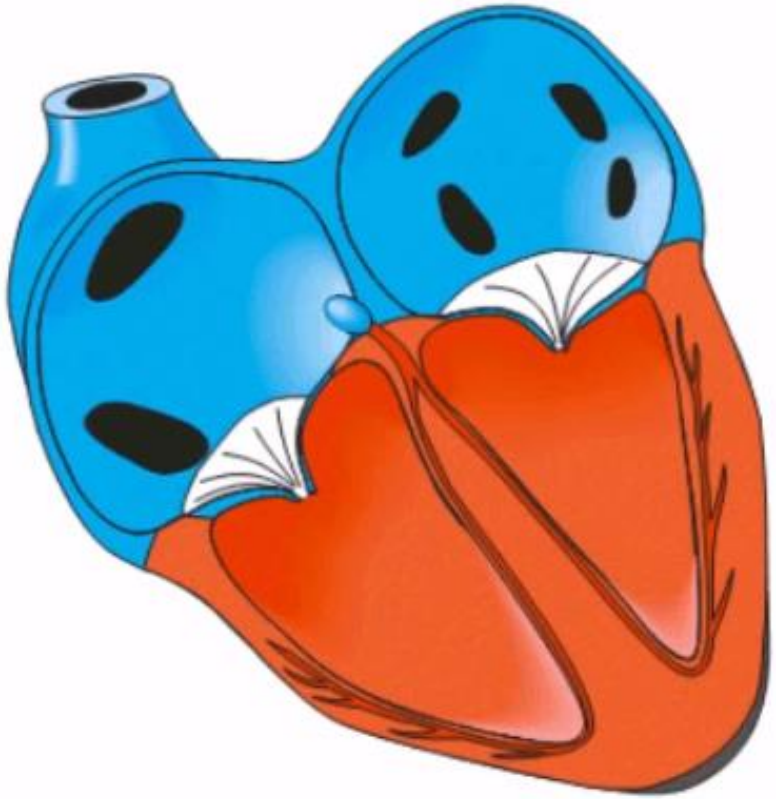


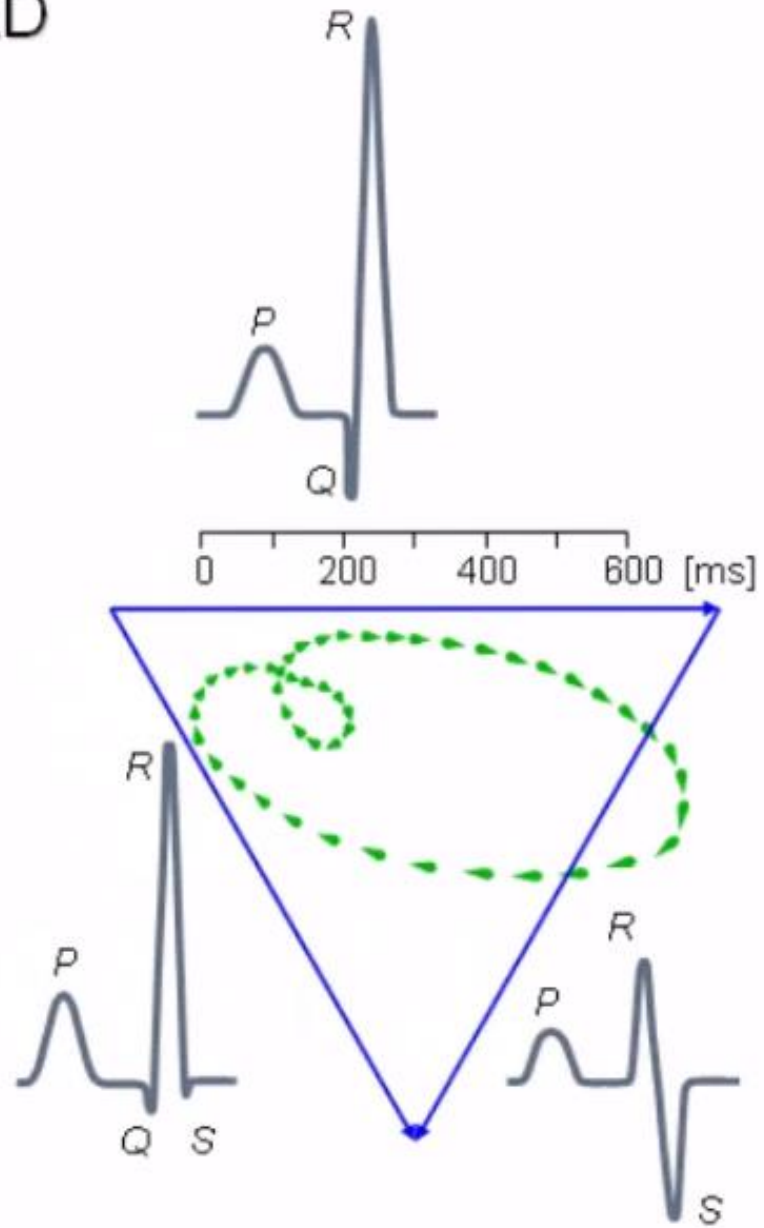
LATE LEFT VENTRICULAR DEPOLAR.
250 ms



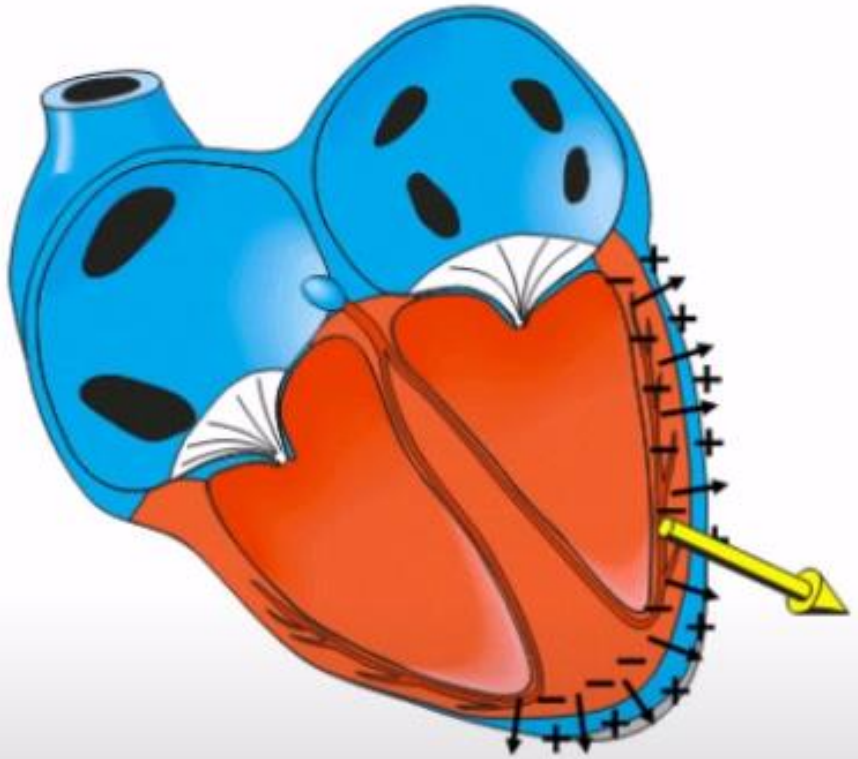


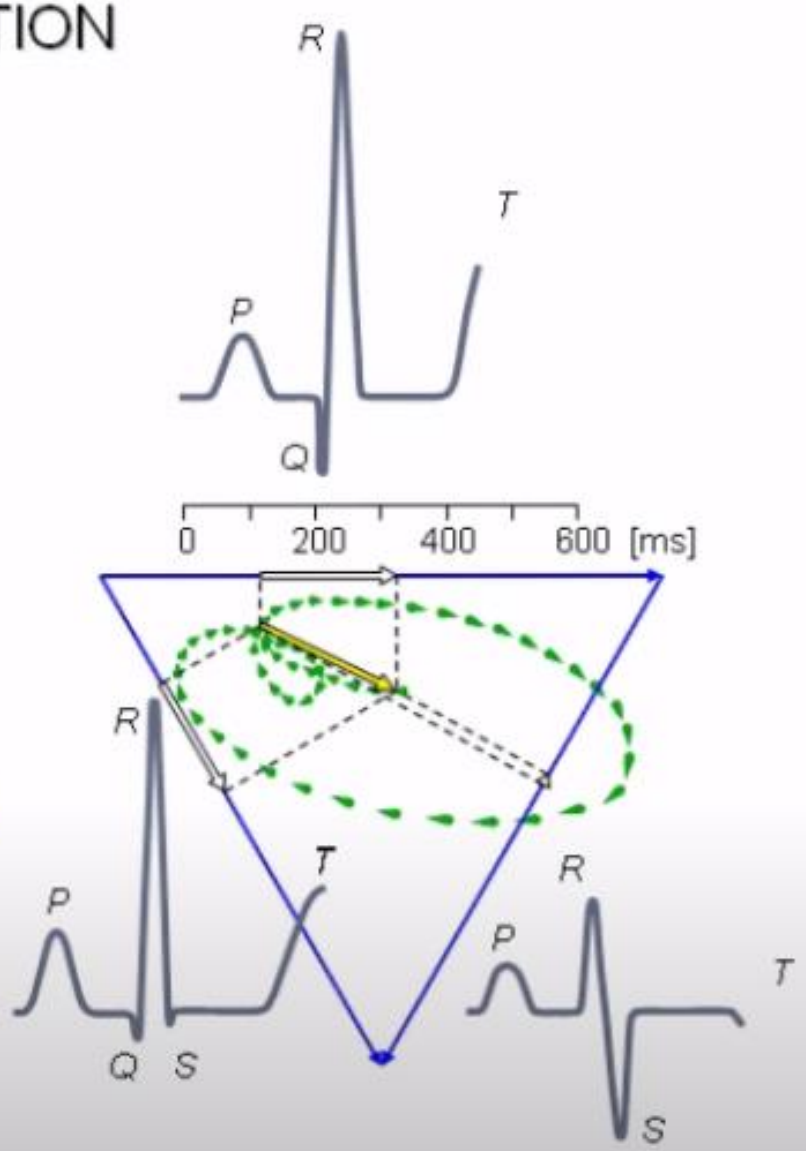
VENTRICLES DEPOLARIZED
350 ms



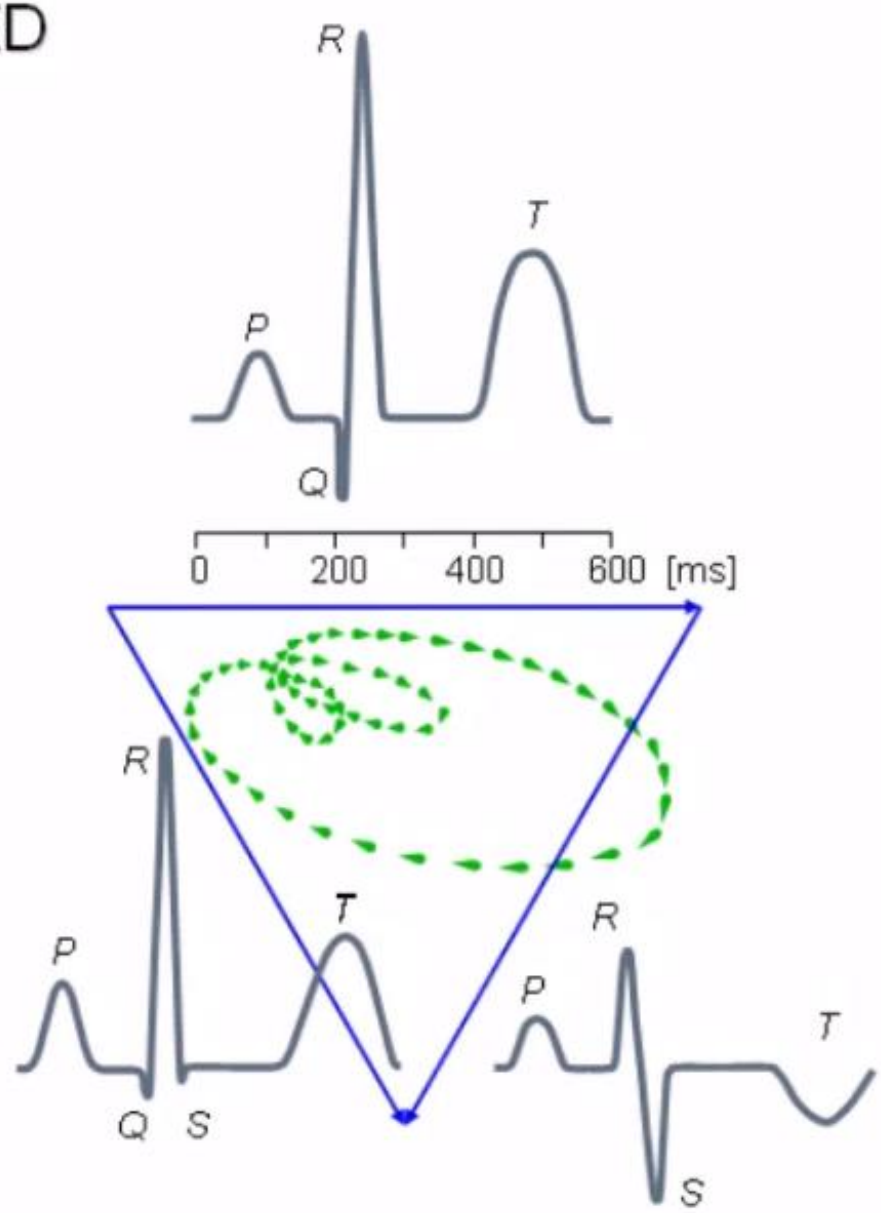


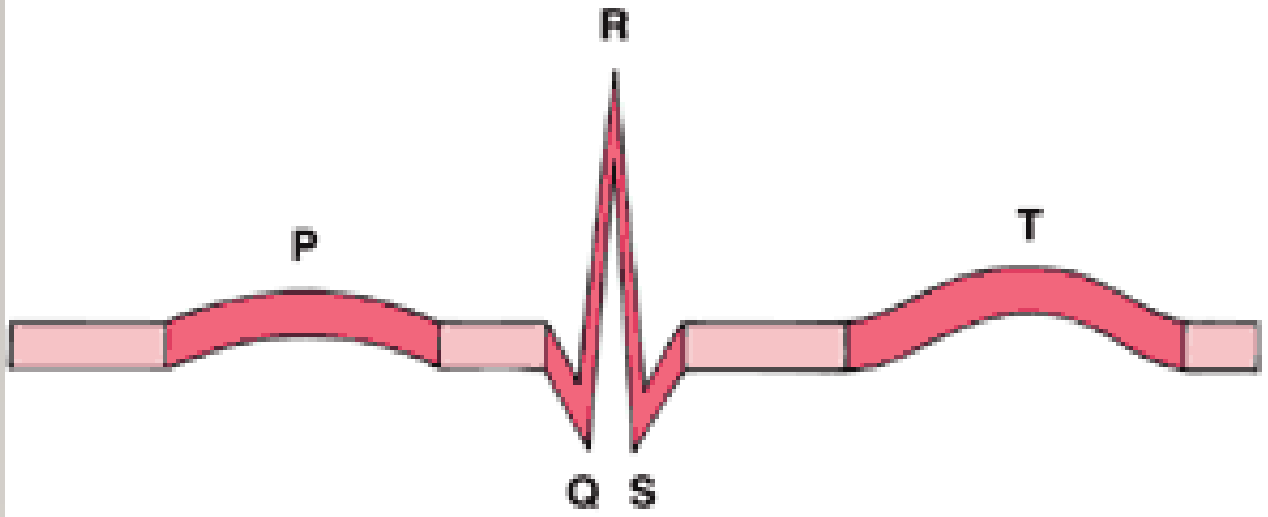
VENTRICULAR REPOLARIZATION
450 ms

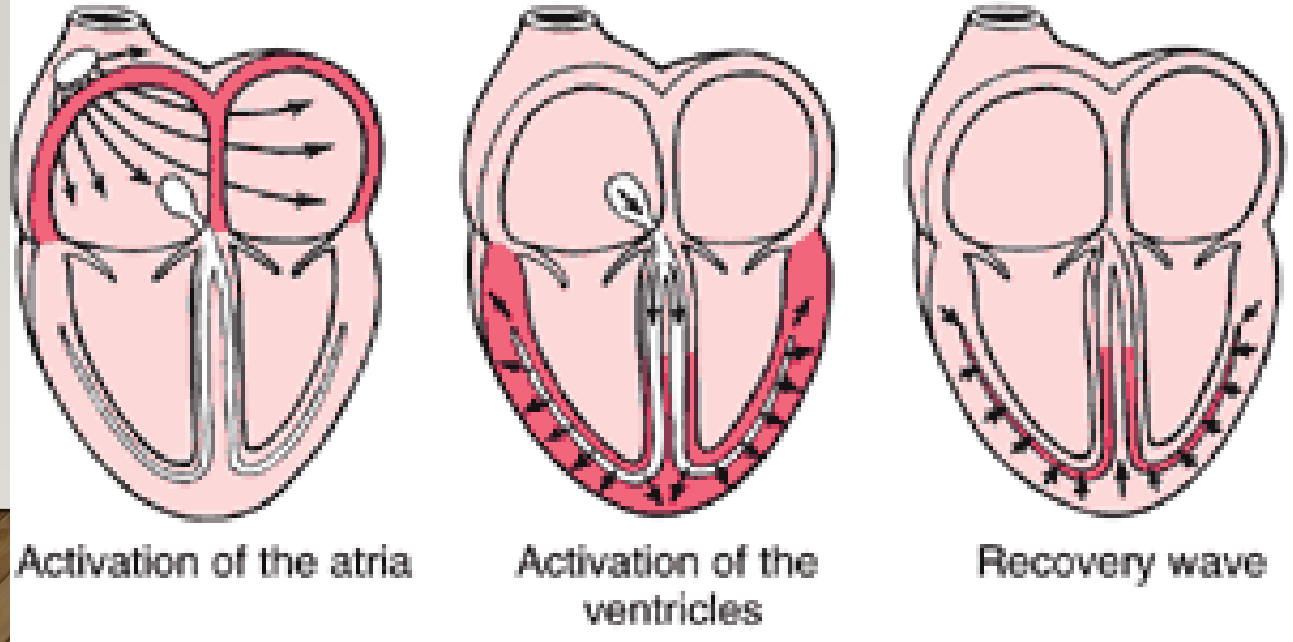


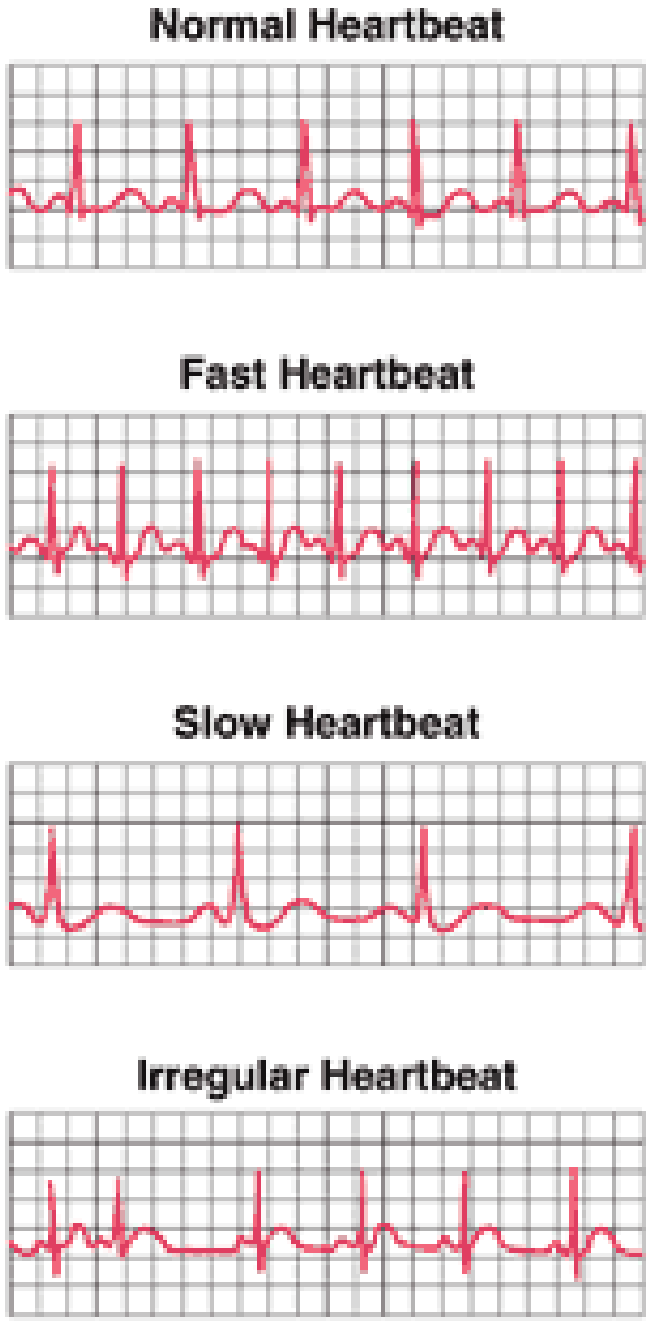


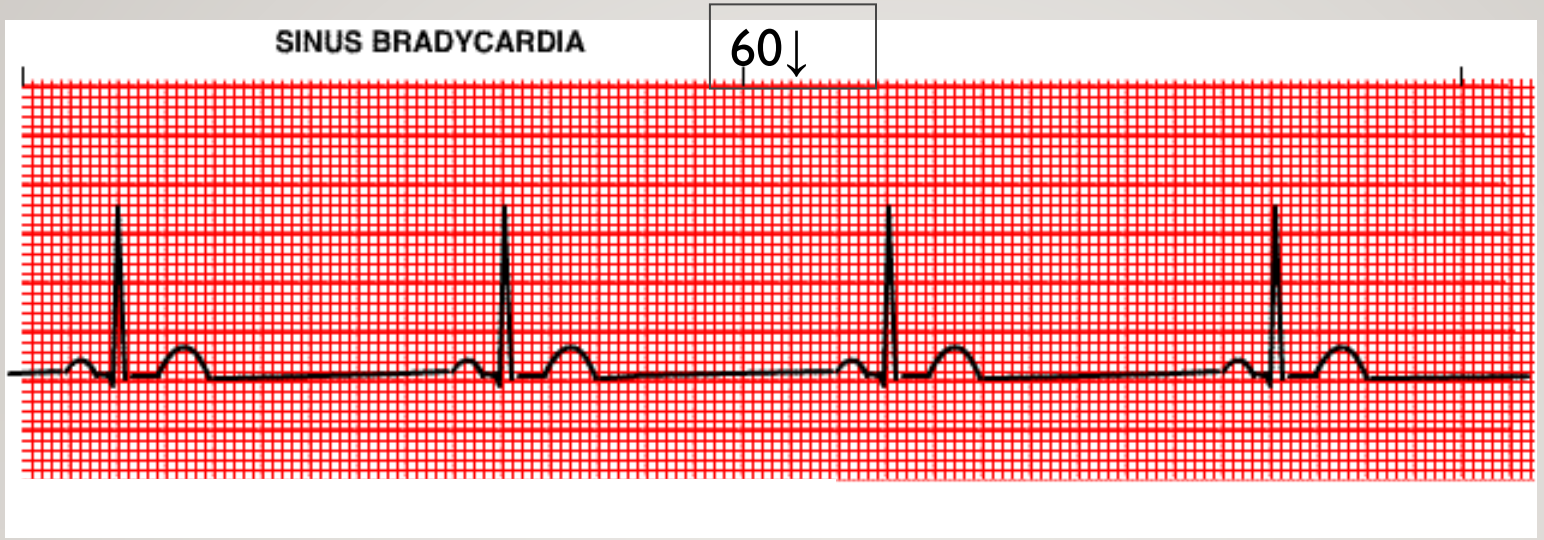
VENTRICLES REPOLARIZED
600 ms

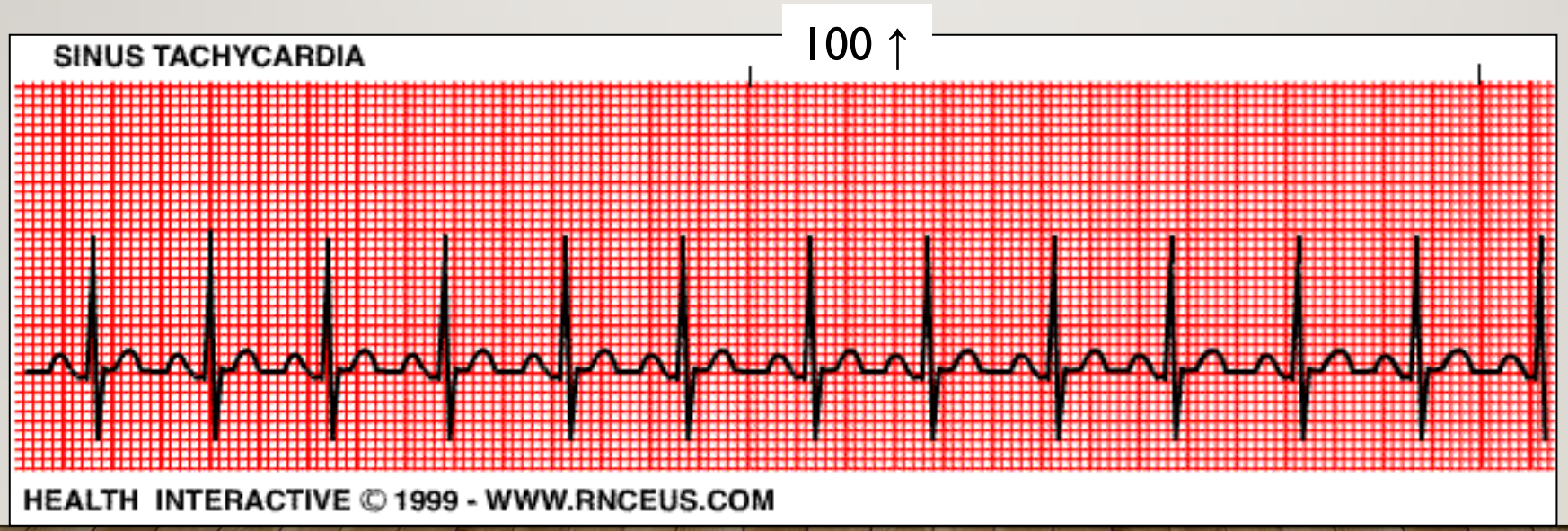



R
P
T
Q
S


P Wave
QRS Complex
T Wave
Activation of the atria
Activation of the ventricles
Recovery wave


Normal Heartbeat
Fast Heartbeat
Slow Heartbeat
Irregular Heartbeat


SINUS BRADYCARDIA
60↓


SINUS TACHYCARDIA
100 ↑
HEALTH INTERACTIVE © 1999 - WWW.RNCEUS.COM