

Topic list related to the individual lectures

Introduction to electrophysiology 1.

Transmembrane transport, Donnan equilibrium, resting potential

Introduction to electrophysiology 2.

Ion channels, Local and action potentials
Intra- and extracellular propagation of the stimulus

Excitation-contraction coupling in cardiomyocytes 1.

Major cellular structures involved in E-C coupling,
Myofilaments: The end effector of E-C coupling,
Sources and sinks of activator Ca

Excitation-contraction coupling in cardiomyocytes 2.

Cardiac action potentials and ion channels
Na/Ca exchange and the sarcolemmal Ca-pump

Excitation-contraction coupling in cardiomyocytes 3.

Ca influx via sarcolemmal Ca channels
Excitation-contraction coupling
Control of cardiac contraction by SR and SL Ca fluxes
Cardiac inotropy, Ca „mismanagement”

The action potential and the underlying ionic currents 1

Depolarization and repolarization activated currents, refractoriness
Relation between the action potential and the ECG

The action potential and the underlying ionic currents 2

Action potential and currents
Na and K currents
Ca currents
Other currents

Cellular cardiac electrophysiological techniques 1.

Action potential measurements

Cellular cardiac electrophysiological techniques 2.

Patch-clamp technique

The mechanism of the cardiac arrhythmias 1

Nomotop activity
Disorder of the automacity I and II
Regulation of the intracellular Ca in heart failure

The mechanism of the cardiac arrhythmias 2

Parasystole, symmetrical and asymmetrical impulse conduction
Re-entry arrhythmias, AV nodal re-entry
Arrhythmogenic potential of the repolarization inhomogeneity