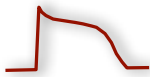






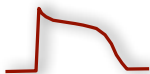
Introduction 2010 Edition



Bioengineering 6003 Cellular Electrophysiology & Biophysics

Organization

- **Instructors:**
 - Rob MacLeod (macleod@cvrti.utah.edu) 
 - Steve Poelzing (poelzing@cvrti.utah.edu) 
 - John Bridge (bridge@cvrti.utah.edu) 
 - Alonso Moreno (moreno@cvrti.utah.edu) 
 - Frank Sachse (fs@cvrti.utah.edu) 
 - Mike Sanguinetti (michael.sanguinetti@hmbg.utah.edu)
 - John White (john.white@utah.edu)
 - Mark Warren (warren@cvrti.utah.edu)
- **Web page:**
 - <http://www.cvrti.utah.edu/~macleod/be6003>
- **Mailing list:**
 - sympa@sci.utah.edu
 - subscribe be-6003 your_name
- **Grading:**
 - Homework assignments (short essays, problems, and computer simulations)
 - Laboratory reports



Bioengineering 6003 Cellular Electrophysiology & Biophysics

Resource Material

- Text (for reference):
 - Ion Channels of Excitable Membranes by Bertil Hille
 - The Physiology of Excitable Cells by David Aidley
 - Heart Physiology by Lionel Opie
- Web site
 - www.cvrtri.utah.edu/~macleod/be6003
- Notes:
 - may be available on the web site in pdf format.
- Additional references:
 - see web site
- Assigned readings:
 - distributed in class or via web
- Computation: Matlab, see web page for links to tutorials



Bioengineering 6003 Cellular Electrophysiology & Biophysics

Class Scheduling

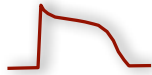
	Mon.	Tues.	Wed.	Thurs.	Fri.
9:00					
10:00					
11:00					
12:00					
13:00					
14:00					
15:00					
16:00					



Bioengineering 6003 Cellular Electrophysiology & Biophysics

Laboratory Exercises I

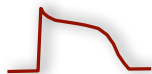
- Ion Channel Lab October 25
 - Mike Sanguinetti
 - Techniques:
 - Glass pipette techniques
 - Single oocyte recordings
 - Channel characterization
 - Identify a channel
 - 3-4 hours lab time, Space for all students at once
- Optical Methods Lab Nov. 22-24
 - Steve Poelzing & Mark Warren
 - Techniques:
 - Chemical and physical basis of optical methods
 - Instrumentation for optical measurement
 - Use voltage sensitive dyes to detect membrane potentials
 - cellular and whole heart components
 - 4-5 hour lab time, divide into groups



Bioengineering 6003 Cellular Electrophysiology & Biophysics

Laboratory Exercises II

- Computational Lab Nov. 10-12
 - Frank Sachse & Rob MacLeod
 - Simulation of ion channels and cells
 - Requires a laptop in the class (is this a problem?)
 - Single lab time (3-4 hours) for whole class



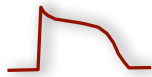
Bioengineering 6003 Cellular Electrophysiology & Biophysics

Goals of the Course

Our Goals:

- Develop intermediate level understanding of electrophysiological principles
- Apply those principles to cardiac and nervous system cells and membranes
- Develop basic understanding of measurement techniques

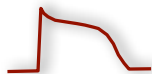
Your Goals?



Bioengineering 6003 Cellular Electrophysiology & Biophysics

Outline of the Course

- Mathematical and biophysical basics
- Membrane channel structure, transport and electrical behavior
- Whole cell structure and behavior
- Excitation-contraction coupling
- Cell to cell communication



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