

Outline for Sanguinetti lectures/lab

Week 3 (Sept 8, 10): Structural basis of voltage-gated ion channel function

- I. Subunits and their assembly chapter 3 (pp 61 – 87); plate 3
- I. Pore and ion selectivity Chapter 13 (pp 423 – 436)
- II. Voltage sensor Plate 2
- III. Activation and inactivation gates chapter 19
- IV. Channel evolution chapter 19
- IV. Channel evolution chapter 22 (pp 709 – 722)

Week 4 (Sept. 15, 17): Ion channel diversity and characterization

- I. Voltage gated channels
 - a. Ca channels chapter 4
 - b. K and Cl channels chapter 5
 - c. Na channels
- II. Ligand-gated channels chapter 6 (pp 169 – 176)
- III. Voltage clamp: whole cell, single channel and gating currents chapter 3 (pp 87 – 93)
- IV. Channelopathies

Week 5 (Sept. 22 or 24 - TBD): Voltage clamp laboratory

- I. Two-microelectrode voltage clamp of *Xenopus* oocytes
- II. Demo of single channel currents and gating currents