These introductory podcasts are offered to help review concepts you’ve already learned in other classes.

These notes should be used to follow along with the Podcasts. These notes are provided to give you an organization of the podcasts as well as most of the figures from them.

You are responsible for all the material presented in the podcasts. Some, but not all, of these concepts will be applied to clinically or physiologically relevant examples in lecture. Regardless of their coverage or lack of coverage in lecture, you will need to understand all of these concepts.

I. MEMBRANE CHARACTERISTICS

Phospholipid bilayer

Membrane Proteins

Integral Proteins

Peripheral Proteins
II. PASSIVE MEMBRANE TRANSPORT

A) Chemical driving force

Net Diffusional Flux \((J) = -P \times A \times (C_1 - C_2)\)

where \(A\) is area, \(C\) is concentration, and \(P\) is membrane permeability

\[= -P \times \text{area} \times (\text{C1} - \text{C2})\]

i. Effect of Concentration

ii. Factors that affect Permeability \((P)\)

Membrane solubility of solute

Size of solute

Presence of membrane channels/carriers

Membrane thickness

iii. Effect of Surface Area \((A)\)
II. Passive Transport (cont.)

Diffusion (cont.)

B) Electrical driving force

III. Mechanisms of Passive Transport

1) Simple Diffusion

2) Diffusion through channels

A) Ungated channels

B) Gated channels

i) ligand-gated

- ionotropic

- metabotropic
III. Mechanisms of Passive Transport (cont.)

B) Gated channels (cont.)

   ii) voltage-gated

   iii) mechanically-gated

   iv) temperature-gated

3) Facilitated Diffusion