So it is back to Discussion as Usual. Here we go:

1) Let’s think about the energy producing process that occurs in the mitochondrion to convert reducing equivalents into ATP production.

a) AN analogy that ofent gets made is between the mitochondrial inner membrane is a battery, which has an electric potential that can be dissipated to produce ATP. Draw a simple schematic of a circuit in which a capacitor is able to drive a motor. Use the box to the right so you don’t go mad...

b) What is the source of the electric potential in this analogy?

c) In the second box, show the effects of adding a weak organic acid to the mitochondrion by drawing a new circuit for this case that makes sense. What happens to the current flow in the “battery”, and what happens to current. What is the usual term for this situation in an electric circuit? It is such a common term you don’t even need to have taken physics to know...

d) In the third box, draw a circuit analogy for adding an inhibitor of ATP synthase, such as oligomycin. Draw that version of the circuit. What happens to current flow in this case? There are several ways to create this analogy, either with a component, or with a needle nose pliers...

e) Finally, in the 4\textsuperscript{th} box, draw the circuit version of the mitochondrion when both oligomycin and a weak organic acid are added. What are the effects on ATP synthesis and current flow to and from the battery?

2) Compare the coupling between the reactions of the glycolytic pathway to the coupling between the ETC and ATP production in mitrochodrial respiration. Why is considering the proton gradient to be a “metabolic intermediate” a useful concept, albeit somewhat abstract, in formulating this comparison.