

How Sodium Transport Controls the Lives of Animal Cells

Don Hilgeman
Professor of Physiology
The University of Texas
Southwestern Medical Center
at Dallas

Monday, January, 11, 2010
Lecture Hall D1.502
5:30 - 8:00 p.m.

STARS

STARS

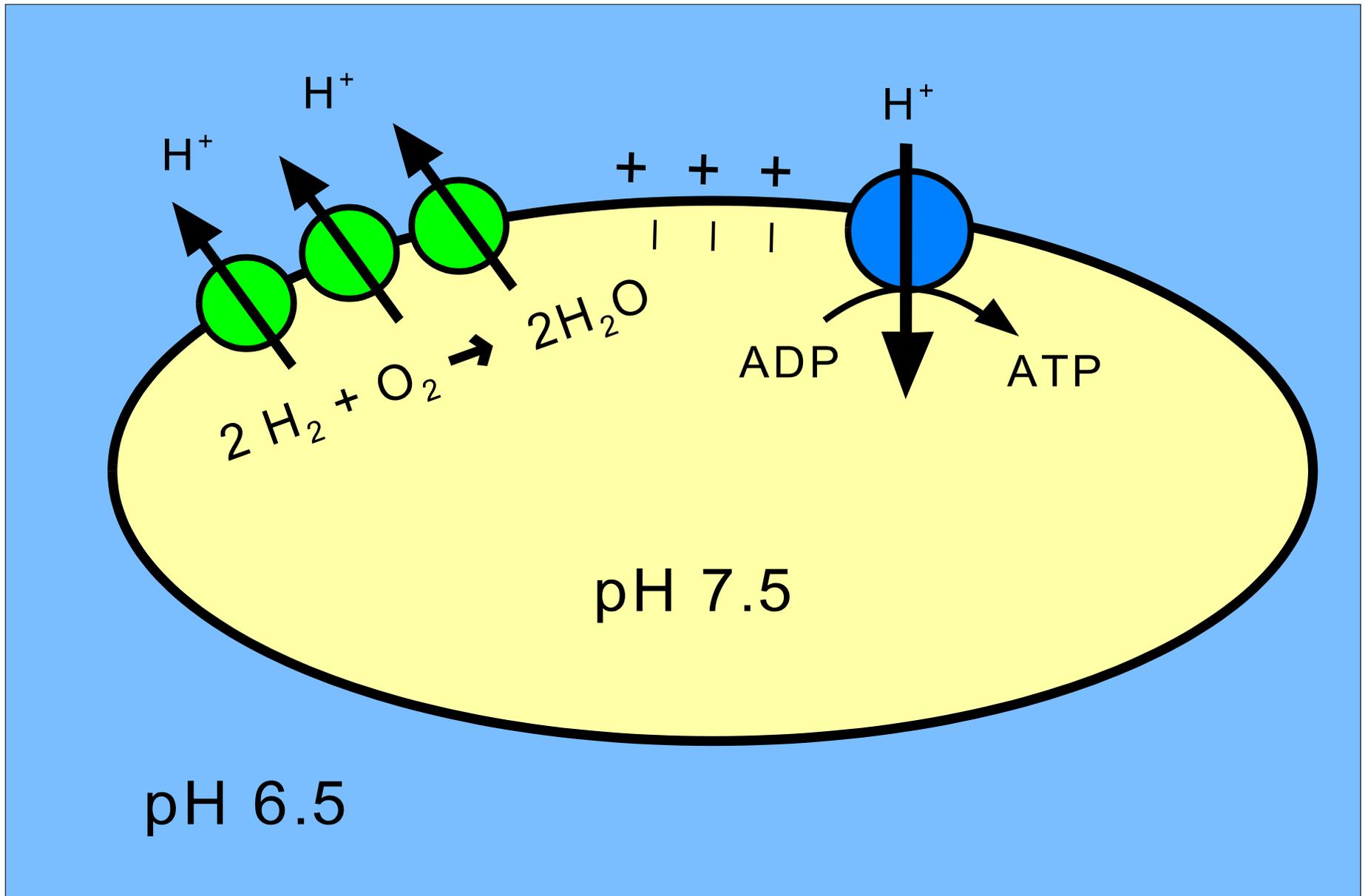
STARS

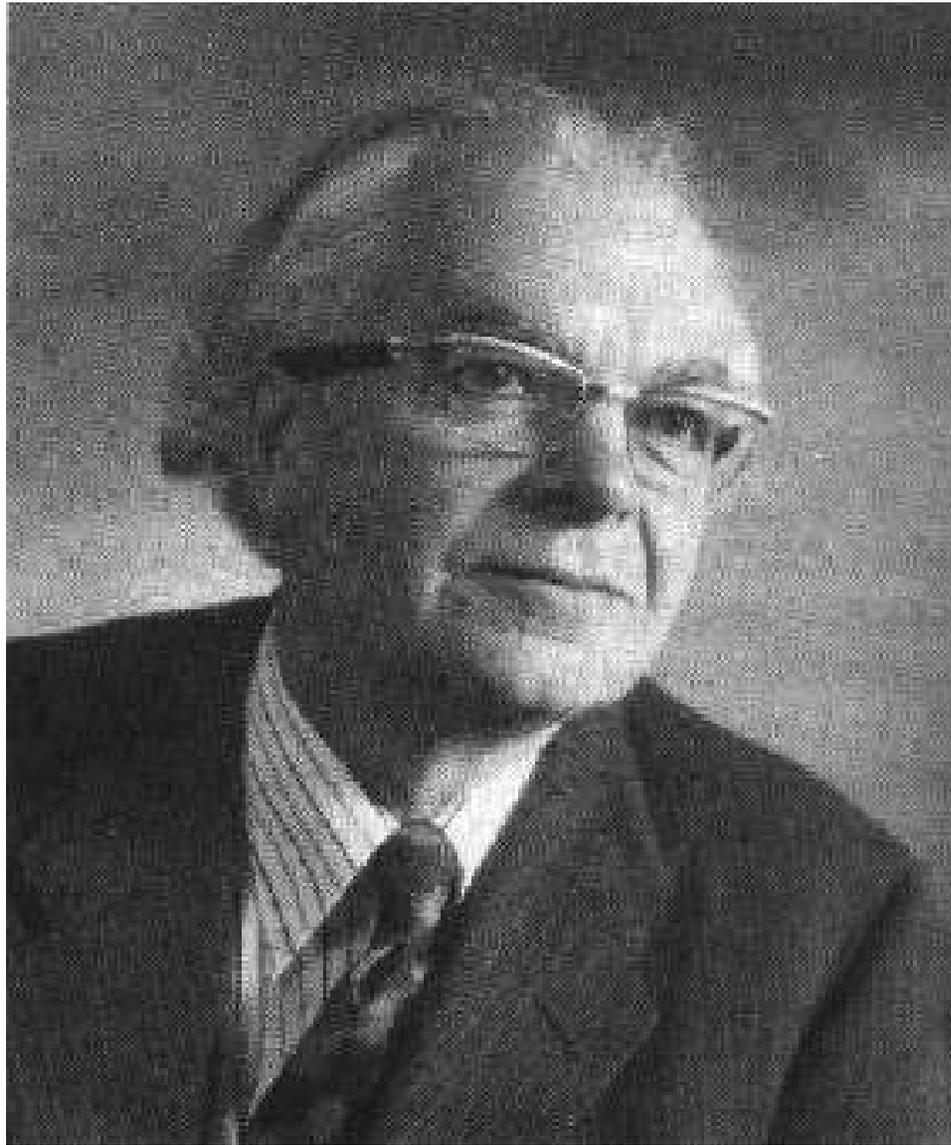
STARS

Mini Symposium

Core funding for the STARS program is provided by the State of Texas.
Corporate funding for STARS is generously provided by: CHASE 

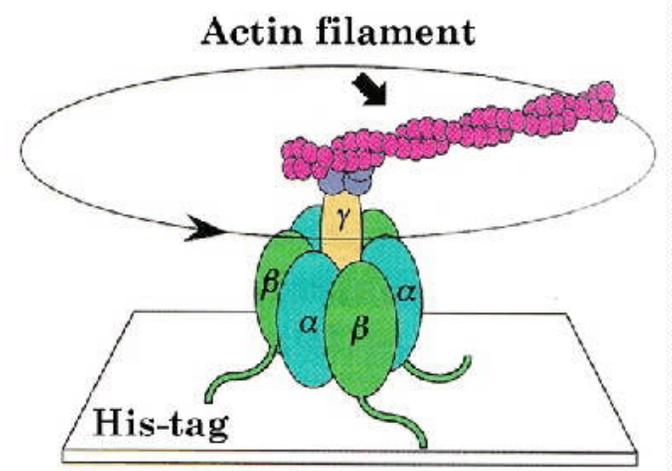
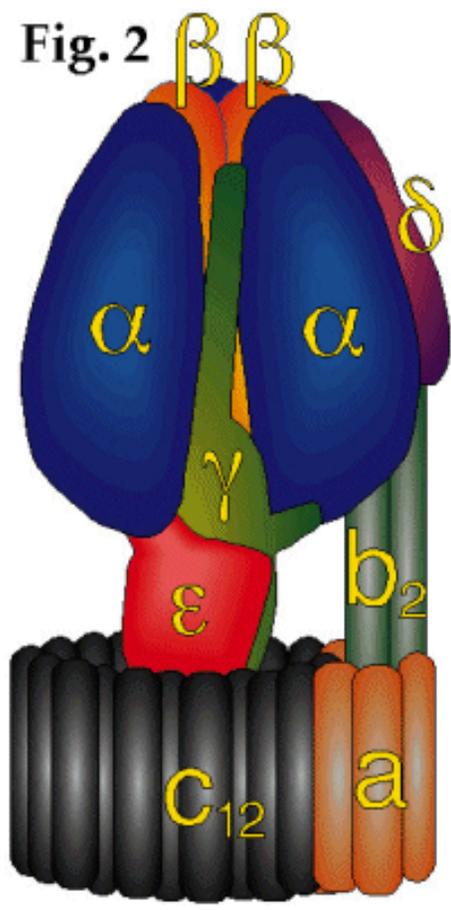
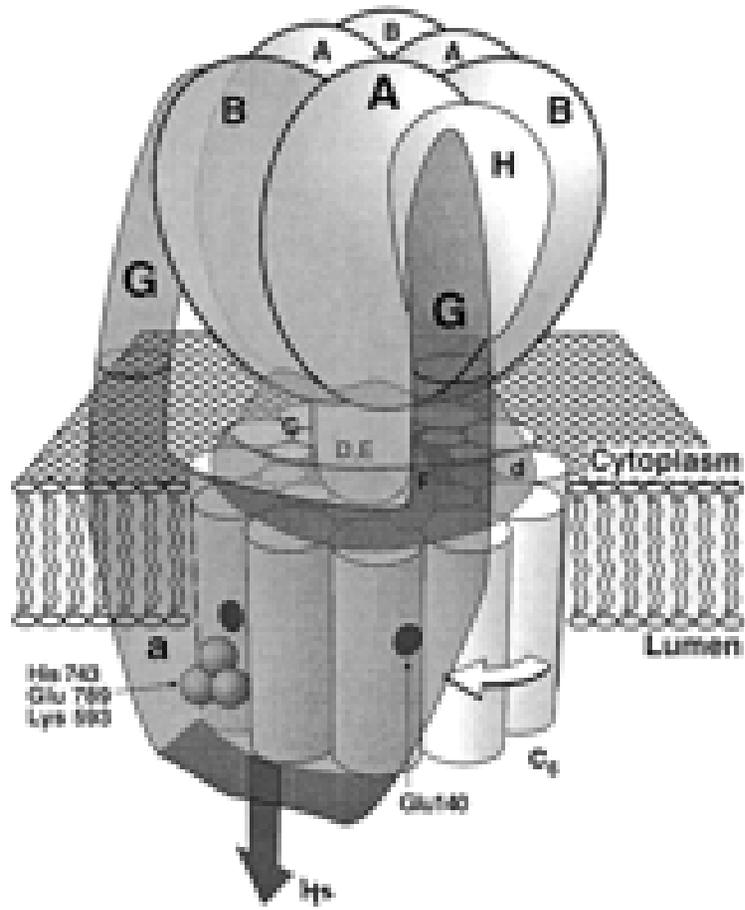
Bacteria and Mitochondria



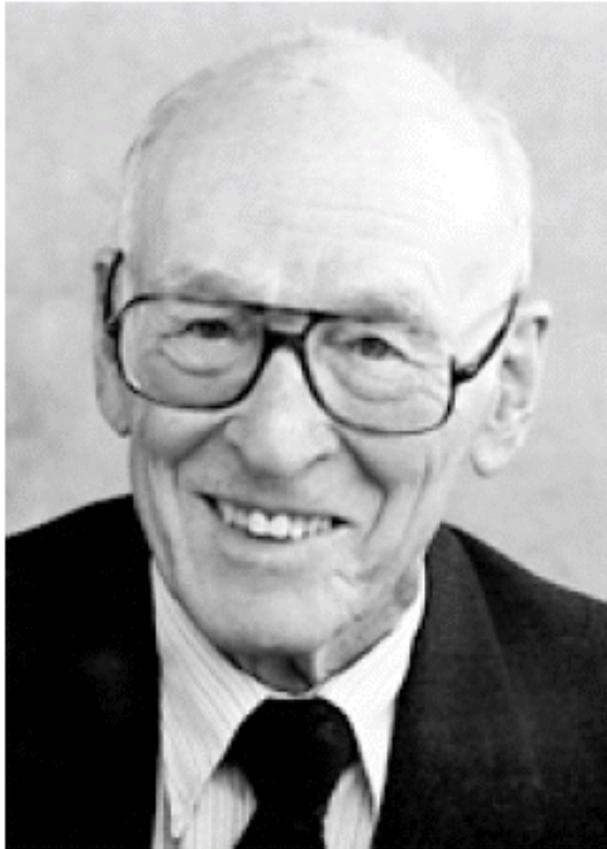


Peter Mitchell (1920-1992)
Nobel Prize - 1978

The F-ATPase

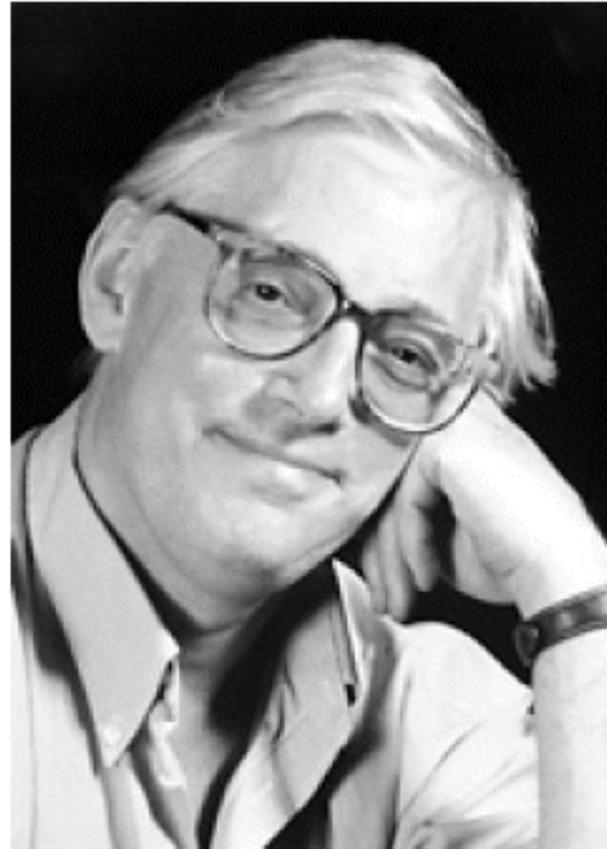


1997 Nobel Prize



Paul D. Boyer

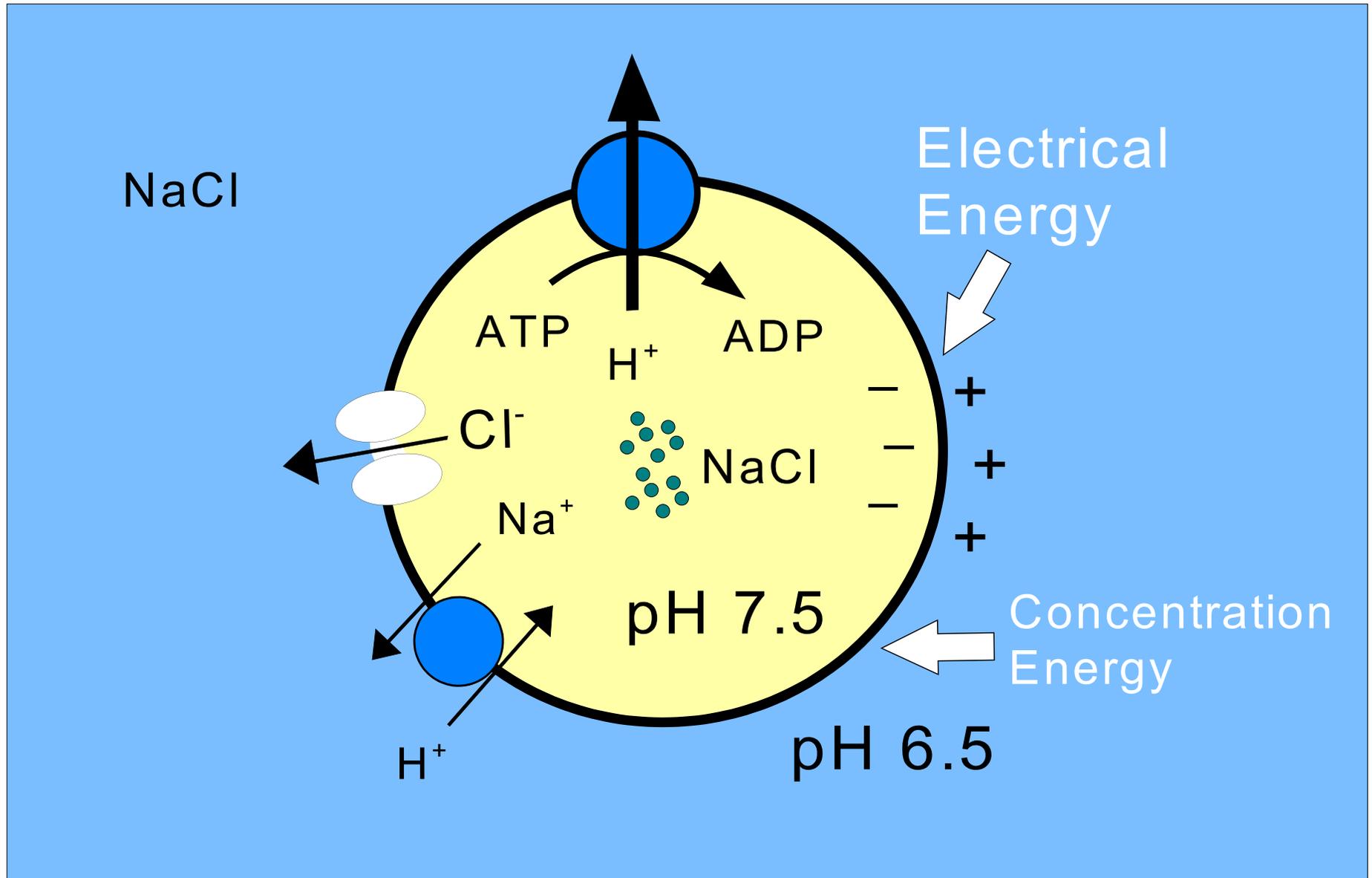
UCLA (USA)
25%



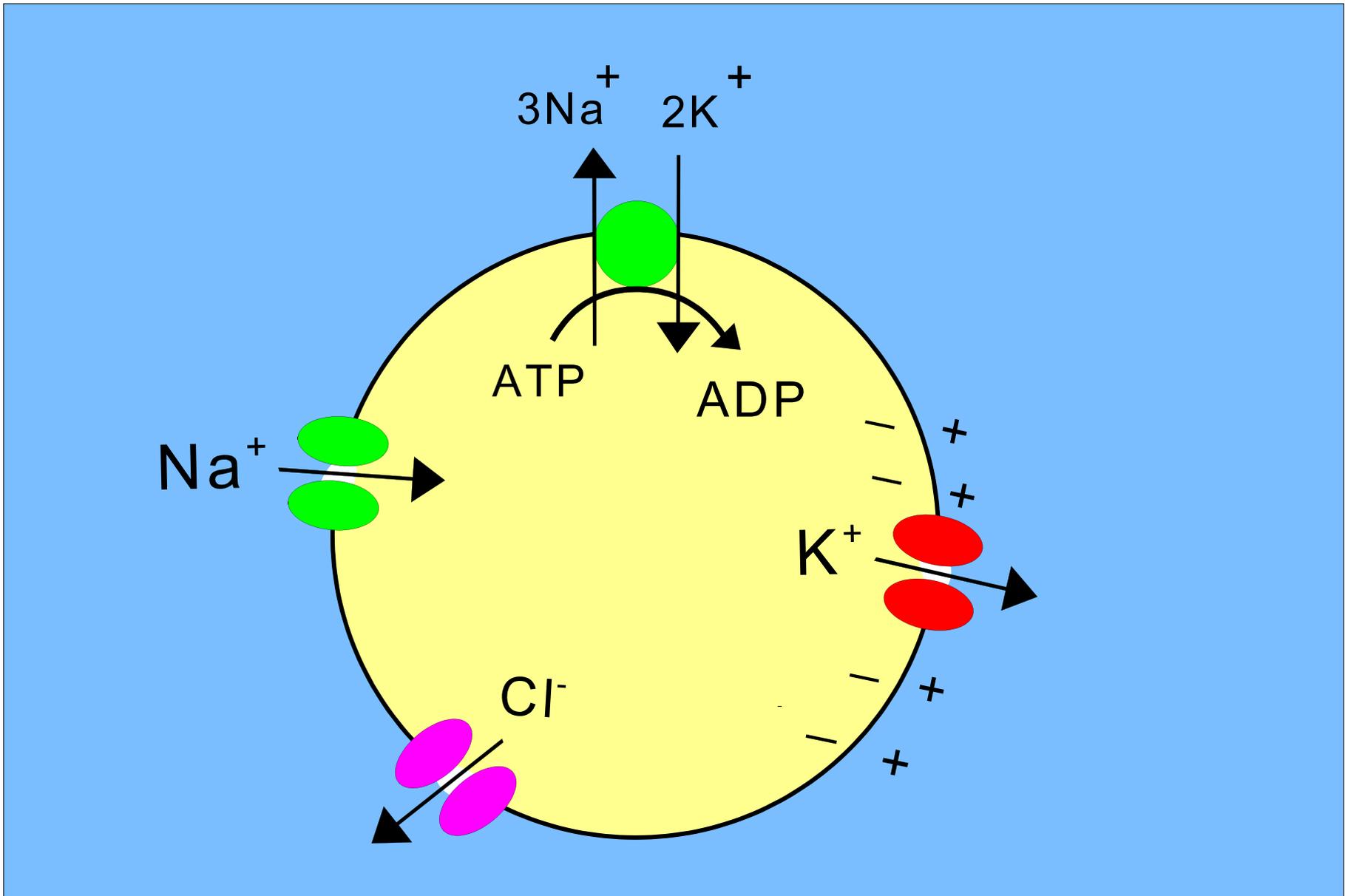
John E. Walker

Cambridge (GB)
25%

Plants, yeast & fungi are proton-fueled



Animal cells use Na/K pumps to energize the membrane.



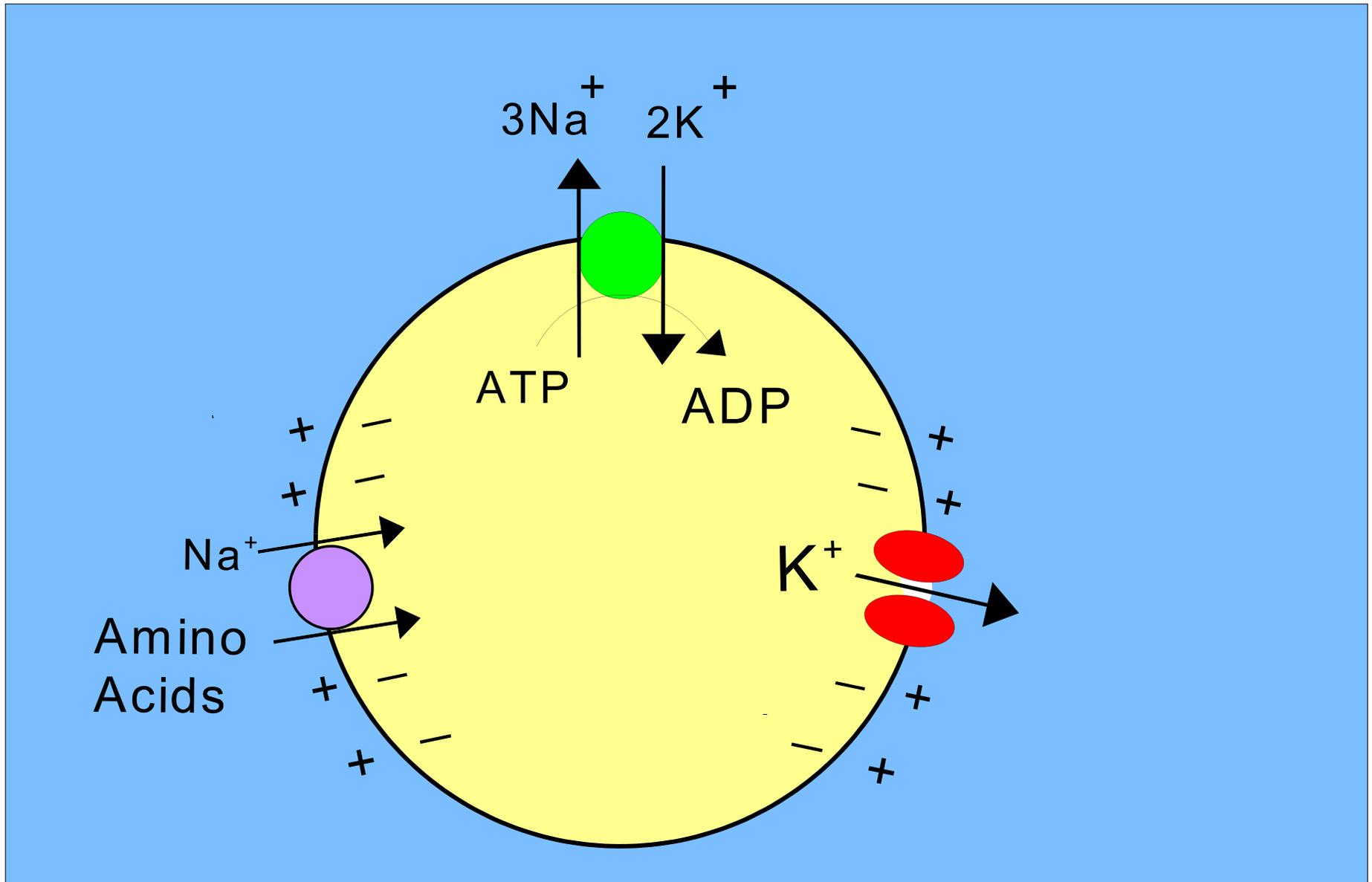
1997 Nobel Prize (50%)

Jens Christian Skou

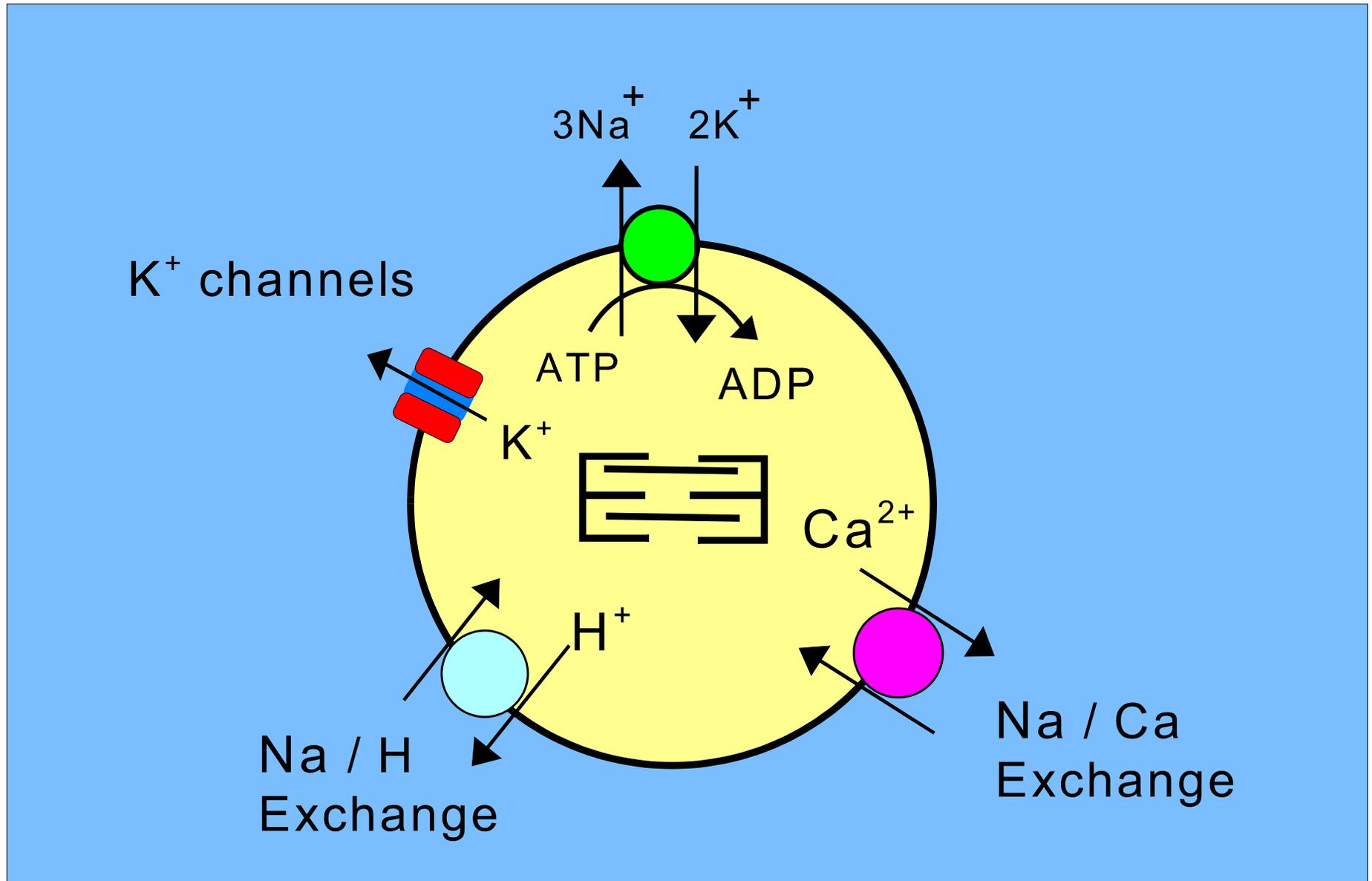


...on his 90th birthday

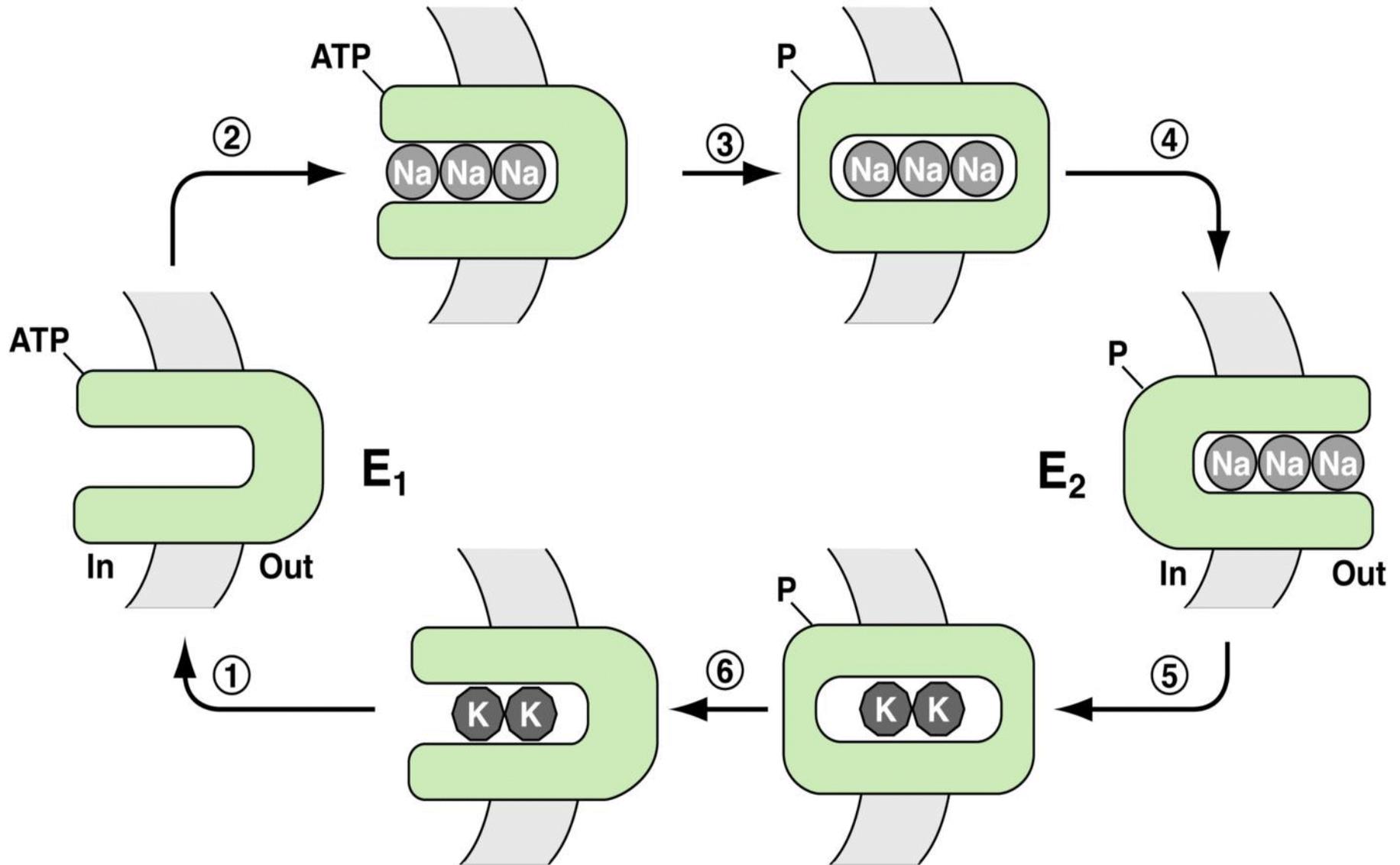
The Na^+/K^+ pump drives uptake of nutrients.



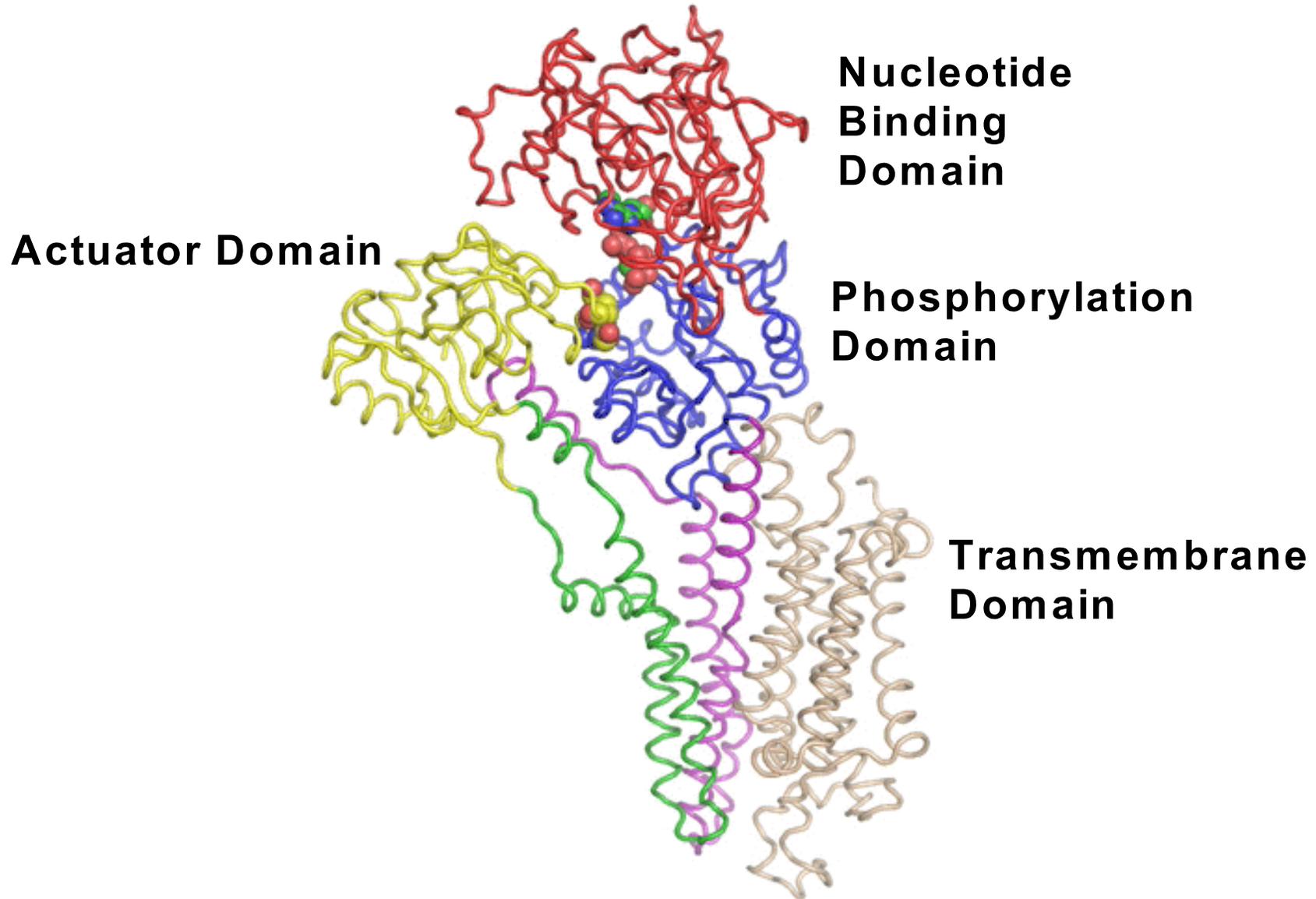
The Na^+/K^+ pump generates proton and Ca gradients.



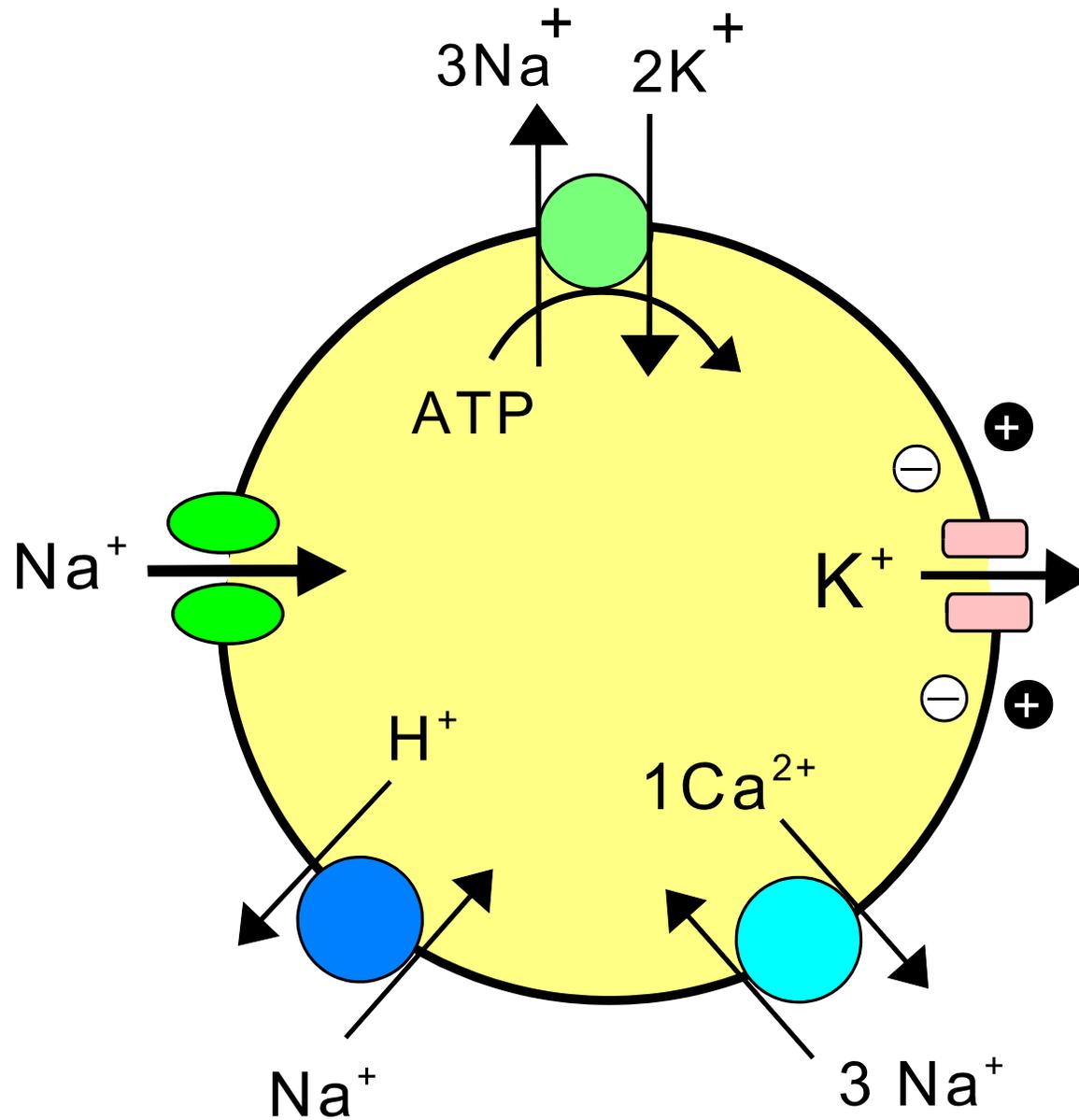
Post-Albers Model of the Na/K pump



Anatomy & Simulation of a P- type Ion Pump

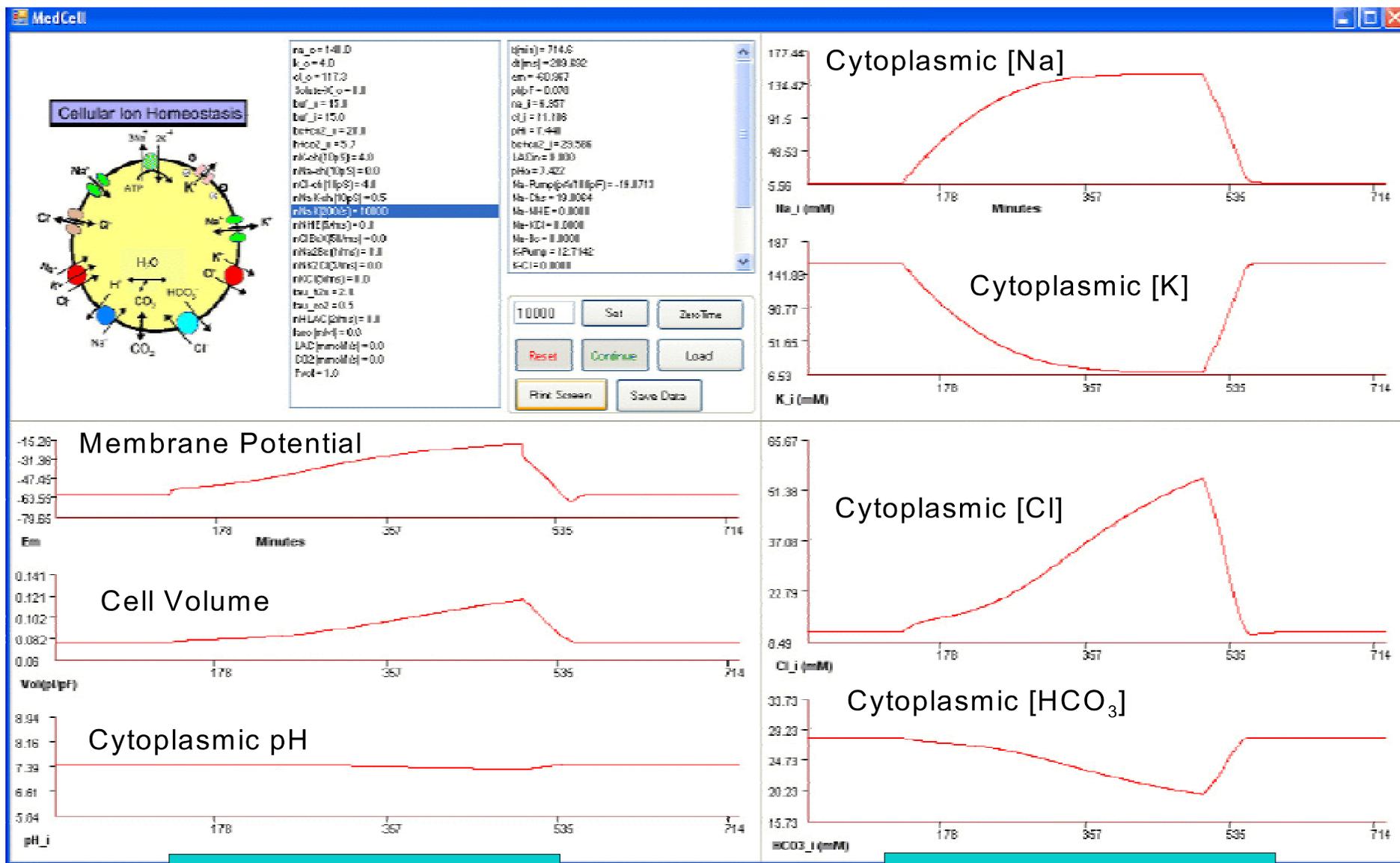


Computational Tools to Analyze Ion Homeostasis: The cardiac myocyte



“MEDCELL”

A program to simulate cellular ion homeostasis, volume, membrane potential, and pH.



Na/K pumps off

Na/K pumps off

**Thank you
for your attention!**