

Abstract Submitted  
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**Teaching Electrostatics and Entropy in Introductory Physics**

MARK REEVES, George Washington University — Entropy changes underlie the physics that dominates biological interactions. Indeed, introductory biology courses often begin with an exploration of the qualities of water that are important to living systems. However, one idea that is not explicitly addressed in most introductory physics or biology courses is important contribution of the entropy in driving fundamental biological processes towards equilibrium. I will present material developed to teach electrostatic screening in solutions and the function of nerve cells where entropic effects act to counterbalance electrostatic attraction. These ideas are taught in an introductory, calculus-based physics course to biomedical engineers using SCALEUP pedagogy. Results of student mastering of complex problems that cross disciplinary boundaries between biology and physics, as well as the challenges that they face in learning this material will be presented.

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