

Meeting: 1003, Atlanta, Georgia, SS 7A, AMS Special Session on Beyond the Spherical Cow: Mathematical Sciences Research to Support Computational Biology

1003-92-1664 **James P. Keener*** (keener@math.utah.edu), University of Utah, Department of Mathematics, 155 S. 1400 E., Salt Lake City, UT 84112. *What can a mathematician tell a physiologist that she doesn't already know?*

Recent advances in biology have resulted in an explosion of information about the parts list of biological organisms. The much larger remaining challenge is to understand how those parts work together to function at the level of an organ or an organism. An emergent property is a feature of a collection that is not a feature of the individual components that make up the collection. It follows that no study of the individual component no matter how detailed or complete can explain the emergent properties of the collection. In this talk some examples of emergent properties that are important in cardiac physiology and the understanding of sudden cardiac death will be described. The main thrust of this talk will be to show ways in which mathematical arguments can lead to insights that are not available by other means. (Received October 05, 2004)