



**The Center for Control, Dynamical Systems, and Computation
University of California at Santa Barbara
Winter 2008 Systems Biology
Seminar Series Presents**

Theoretical and Experimental Analysis of Chemotactic Systems in Biology

Pablo Iglesias

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Tuesday, January 8, 2008 11:00am-12:00pm Harold Frank Hall 1132

Abstract:

Many biological systems have the ability to sense the direction of external chemical sources and respond by polarizing and migrating toward chemoattractants or away from chemorepellants. This phenomenon, referred to as chemotaxis, is crucial for proper functioning of single cell organisms, such as bacteria and amoebae, as well as multi-cellular systems as complex as the immune and nervous systems. Chemotaxis also appears to be important in wound healing and tumor metastasis.

In this talk I will discuss our group's efforts at elucidating the mechanisms underlying chemotaxis. Using known biochemical data, we have developed mathematical models that can account for many of the observed chemotactic behavior of the model organism *Dictyostelium*. I will discuss experiments used to test these models. Finally, I will describe how information-theoretic methods can be used to evaluate the optimality of the gradient sensing mechanisms.

About the Speaker:

Pablo Iglesias is a professor in the Department of Electrical and Computer Engineering at Johns Hopkins University. He received his BAsC in Engineering Science from the University of Toronto and his PhD in Control Engineering from Cambridge University in 1987 and 1991, respectively. His research focuses on the mathematical modeling of signal transduction pathways. His main two focus areas are in directed cell migration and cellular division.