

第21回 MEE SEMINAR

MATHEMATICAL ECOLOGY & EVOLUTION

2010年5月25日(火) 14:40~16:10
明治大学生田キャンパス第二校舎A館: A207

小田急小田原線 「生田駅」から徒歩10分
又は「向ヶ丘遊園」駅北口から「明治大学正門前」行きバスで15分終点下車
詳しくは、http://www.meiji.ac.jp/koho/campus_guide/ をご覧下さい

May 25, 2010. 14:40~16:10 **Meiji Univ. Ikuta campus A207**

Theoretical prediction of optimal intracellular kinetics for information extraction from noisy environmental signal

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Abstract:

Decision-making in a noisy and dynamically changing environment is a fundamental task for a cell. To choose appropriate decisions over time, a cell must be equipped with intracellular kinetics that can conduct dynamic and efficient decision-making. But what kind of kinetics can do such an ingenious task? To solve this problem theoretically, I employed the theory of sequential inference, with which I demonstrate that a dynamic Bayesian decision-making can be implemented by an intracellular kinetics with dual positive feedback structure. I also show that the combination of linear instantaneous and nonlinear stationary sensitivities to the input dominantly contributes to decision making efficiency, and that the state-dependent sensitivity change further suppresses noisy response. The statistical principles underlying these two factors are further clarified to be log-likelihood-dependent quantification of the input information and uncertainty-dependent sensitivity control. The biological implications of this result will be discussed with several experimental evidences.

参加自由です。皆様のお越しをお待ちしております。

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