

Abstract Submitted  
for the MAR06 Meeting of  
The American Physical Society

**Flux Analysis of Hypoxia Response Network.** YIHAI YU, Department of Physics, George Washington University, RAHUL SIMHA, Department of Computer Science, George Washington University, FRANK TURANO, Department of Biological Sciences, George Washington University, CHEN ZENG, Department of Physics, George Washington University — The availability of cellular oxygen regulates many physiological processes. Oxygen deficiency, i.e., hypoxia, induces expression of a set of genes that are involved in angiogenesis and metabolism. Here we report a detailed flux analysis on a theoretical model on hypoxia response network proposed by Kohn et al. The network is decomposed into smaller underlying pathways which are amenable to direct analytical calculations and capture the essence of the original larger network as observed in numerical simulations. Our analysis elucidates a generic mechanism for the switch-like response of gene up-regulation to hypoxia.

Yihai Yu  
Department of Physics, George Washington University

Date submitted: 02 Dec 2005

Electronic form version 1.4